UDC 65 ISSN 0353-443X

YEAR LXXII MAY - JUNE 2024

Economics of Enterprise

EKONOMIKA PREDUZEĆA

Serbian Association of Economists
Journal of Business Economics and Management

70 ME
GODINA USPEHA

Sa više od 70 godina tradicije u pružanju projektantskih i konsultantskih usluga, ali i sposobnošću da se kontinualno prilagođava savremenim poslovnim i tehnološkim trendovima, Energoprojekt ENTEL se danas sa razlogom svrstava u grupu vodećih konsultantskih kompanija u oblasti energetike i vodoprivrede u Srbiji, ali i u regionu Bliskog istoka.

ME ENERGOPROJEKT
ENTEL a.d.
GRADIMO SVET ZAJEDNO

www.ep-entel.com

UDC 65 ISSN 0353-443X

Economics of Enterprise
EKONOMIKA PREDUZEĆA

Journal of the Serbian Association of Economists
Founded in 1947 in Belgrade
Year LXXII May-June
No. 3-4 Page 151-252
Publisher:
Serbian Association of Economists
Editorial Office and Administration
Dobrinjska 11/1
Bulevar Mihajla Pupina 147
11000 Belgrade, Serbia
Phone: 011/264-49-80; 361-34-09
Account No: 205-14935-97 NLB Komercijalna banka
Web: www.ses.org.rs
E-mail: office@ses.org.rs

Printing office
"Kuća štampe plus", Zemun, 011 307.5.307 stampanje.com
Printed in 100 copies
The journal is published four times a year

This issue of *Economics of Enterprise* starts with three compelling papers in the *Economic Growth and Development* section, each offering insightful perspectives and solutions. The first paper in this section, unfortunately, marks the last contribution made by *Miladin Kovačević* to economic theory and practice. He was one of the most distinguished economists Serbia has ever had, with a brilliant background in mathematics and statistics. This exceptional economist sadly passed away before the release of his final work. Most people never have the opportunity to work with someone as driven, talented, and caring as he was. As academic economists and practitioners, we were fortunate to have worked with such a luminary. Amid the complex emotions inspired by this sad event, the prevailing sentiment is one of gratitude.

In collaboration with *M. B. Stevović*, *M. Kovačević* explored Serbia's external debt sustainability and its implications for long-term growth. The authors present an empirical model distinct from those regularly proposed by the IMF and WB. Actually, they used a nuanced approach to macroeconomic projections based on debt burden. In the context of multiple crises, this model could and should be crucial for understanding Serbia's economic resilience to risk stressors and its potential for sustainable growth. A duo of authors, *M. Nedeljković* and *I. Todorović,* introduces an advanced empirical framework for analyzing the key drivers of FDI in Serbia. They identify potential constraints and opportunities for boosting FDI in higher value-added sectors. This paper is essential for policymakers aiming to enhance Serbia's attractiveness as a destination for FDI, particularly in industrial production and the tech sector based on R&D. In the third paper in this section, *M. Lutovac Đaković* examines the transformative role of industrial policy in Serbia's economic development. Her analysis of state incentives' impact on investment projects between 2006 and 2016 highlights significant progress and the challenges ahead. The paper brings attention to the importance of strategic industrial policy in achieving sustainable economic growth and integration into global value chains.

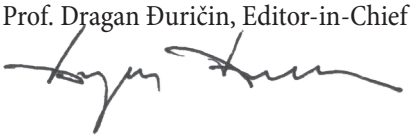
In the *Tax and Law* section, *I. Domazet* and *D. Marjanović* provide a detailed study on the impact of non-fiscal levies and other taxes on Serbia's fiscal competitiveness. The authors emphasize the significance of tax policy in attracting and retaining foreign investment, offering valuable insights for optimizing Serbia's tax structure to improve its investment climate.

The *Marketing* section features research by a trio of authors, *S. Trajković*, *S. Milosavljević*, and *I. Aleksić,* on the role of digital marketing techniques in creating user experiences and customer engagement. Their findings indicate the considerable impact of digital marketing on consumer behavior and loyalty, underlines the importance of integrating these techniques into business strategies for enhanced co-creation and customer satisfaction.

In the *Information Technologies* section, *N. Tomić* and *M. Mirić* explore the determinants influencing Serbian gamers' adoption of microtransactions in mobile games. Using an extended Technology Acceptance Model (TAM), they identify key predictors such as perceived enjoyment and social factors. This study offers valuable insights for game developers and marketers aiming to optimize their monetization strategies.

The *Tourism and Hospitality Management* section includes two engaging papers. The first one, written by *M. Zrnić* and *I. Lončar*, delves into the impact of quality hospitality service on guest satisfaction in Serbia's tourism industry. The authors demonstrate the significant correlation between service quality and gastronomic experiences, stressing the need for continuous improvement in hospitality standards to boost guest loyalty and enhance the overall tourism experience. In the last paper of this issue, *I. Kovačević*, *B. Hristov Stančić*, and *B. Zečević* discuss Serbia's participation in EXPO 2020 Dubai, focusing on nation branding and soft power. They analyze the strategic use of EXPO to enhance Serbia's international image and economic relations, providing a comprehensive overview of the benefits and outcomes of such global events.

Prof. Dragan Đuričin, Editor-in-Chief



ORIGINAL SCIENTIFIC PAPER
UDK: 336.27(497.11)
336.144.2"2024/2033"
DOI: 10.5937/EKOPRE2404151K
Date of Receipt: December 18, 2023

Miladin Kovačević
Statistical Office of the Republic of Serbia

Milena B. Stevović
Statistical Office of the Republic of Serbia

SERBIA 2024-2033: DEBT SUSTAINABILITY AND GROWTH PERFORMANCE TESTING

Srbija 2024-2033 – testiranje održivosti duga i performansi rasta

Abstract

This paper examines Serbia's external debt sustainability in order to assess the applicability of the selected growth model. To this end, an empirical model was created for the generation of long-term projections and assessment of debt sustainability. The model distinguishes itself from existing models created by the International Monetary Fund and the World Bank as a practical tool. The macroeconomic balance table approach of the model, in contrast to these existing models, ensures that changes in one table reflect changes in others, thus ensuring both internal and external validity. It harmonizes individual macroeconomic aggregates and variables by combining them all at the same time. As a result, a detailed framework of interconnected long-term forecasts is established. In addition to this, the second part of the paper is dedicated to dynamic analysis of external debt by investigating which factors contribute to the creation of external debt and assessing their impact. In order to understand the extent of these contributions, a sensitivity analysis of the debt is performed. Utilizing this model of macro-projections, we can examine the debt path and evaluate how projected debt values respond to different macroeconomic shocks. This is particularly crucial given the growing global uncertainty, which includes both economic changes and security issues. Current conflicts in Ukraine and Gaza are likely to make investors more cautious about investing abroad. This presents significant challenges for small and open economies like Serbia in obtaining the necessary funding for its planned economic growth and development.

Keywords: *external macroeconomic position, development scenario, debt dynamics, model sensitivity*

Sažetak

Rad ispituje održivost spoljnog duga Srbije kako bi se procenila primenljivost izabranog modela rasta. U tom cilju, kreiran je empirijski model za generisanje dugoročnih projekcija i procenu održivosti duga. Model se razlikuje od postojećih modela koje su kreirali Međunarodni monetarni fond i Svetska banka kao praktičan alat. Pristup kojim se integrišu makroekonomske bilansne tabele, za razliku od ovih postojećih modela, osigurava da promene u jednoj tabeli odražavaju promene u drugim tabelama, čime se osigurava i unutrašnja i spoljašnja validnost. Model usklađuje pojedinačne makroekonomske agregate i varijable kombinujući ih sve istovremeno. Kao rezultat toga, uspostavlja se detaljan okvir međusobno povezanih dugoročnih projekcija. Pored ovoga, drugi deo rada posvećen je dinamičkoj analizi spoljnog duga kroz istraživanje faktora koji doprinose stvaranju spoljnog duga i procenu njihovog uticaja. Da bi se razumeo opseg ovih doprinosa, izvršena je analiza osetljivosti spoljnog duga. Koristeći ovakav pristup u izradi makroprojekcija, možemo ispitati putanju duga i proceniti kako projektovane vrednosti duga reaguju na različite makroekonomske šokove. Ovo je posebno važno s obzirom na rastuću globalnu neizvesnost, koja obuhvata i ekonomske promene i bezbednosna pitanja. Trenutni konflikti u Ukrajini i Gazi verovatno će učiniti investitore opreznijim u pogledu njihove spremnosti da ulažu u inostranstvo. Upravo to predstavlja značajne izazove za male i otvorene ekonomije poput Srbije u obezbeđivanju neophodnog finansiranja za planirani ekonomski rast i razvoj.

Ključne reči: *eksterna makroekonomska pozicija, razvojni scenario, dinamika duga, senzitivnost modela*

Introduction

The analysis of the long-term sustainability of external debt usually includes an assessment of a number of factors, including economic growth (from the expenditure side of Gross Domestic Product), balance of payments, i.e. foreign trade, foreign direct investment, remittances from abroad and other factors that affect external debt. These factors are important because they may affect Serbia's ability to repay its debt in the future. At the same time, they also represent channels through which influences from the international environment are manifested, and it is necessary to develop such an analytical approach that will enable timely quantification of external shocks. When interpreting the results of the analysis, that is, the derived values of indicators explaining external macroeconomic position of the country, the so-called soft factors such as the legal system, political events in the country, unresolved international issues, military-security challenges must be taken into account because all of these can greatly relativize the obtained results.

Depending on the objectives and available information, different approaches can be used in analysing the sustainability of a country's external debt.

Nevertheless, most existing methods rely on a mix of conjunctive analysis and complex econometric models. When applied to developing economies facing both internal and external pressures, these models are often less suitable due to data series breaks, difficulties in maintaining consistency across projections, and a lack of consideration for qualitative institutional factors. This limitation can be addressed by using a set of macroeconomic balance equations with a minimal inclusion of behavioural equations. This approach is central to the financial programming models utilized by the International Monetary Fund (IMF) and the World Bank (WB).

Polak [13] introduced the first financial programming model, which represents a systematic effort to integrate monetary policy with balance of payments issues. This model was later expanded to form the basis of IMF stabilization programs for economies with fixed exchange rates. Over time, this model underwent several modifications.

In the beginning of 1970s, WB introduced the Revised Minimum Standard Model (RMSM). The main goal of the approach is to find out the necessary levels of investment, imports, and financing resources from abroad required to obtained wanted real GDP and export growth rates. The model is based on a two-gap accounting framework, addressing the gap between investments and savings and the trade gap with the rest of the world. If domestic savings are insufficient to fund the targeted investment, the shortfall is covered by foreign financing through net imports. While the model's simplicity is a strength, it also presents challenges due to its simplified linkages and its reliance on numerous exogenous factors [1, p. 28].

With the aim to cover more policy options, the model was developed in such a way so as to include more economic agents inside a congruous flow-of-funds framework. This version, known as the Revised Minimum Standard Model eXtended (RMSM-X), includes four economic agents, i.e. sectors: Public (central government), Monetary (central bank and deposit money banks), Foreign (balance of payments), and Private (rest of the economy). Each sector has two accounts: a current account and a capital account. The fundamental macroeconomic identity on which the RMSM-X is based and its further explanation are already provided in Kovačević & Stević [10].

Based on the selected economic growth scenario and related model assumptions, the model produces outputs that are used to calculate indicators of the external macroeconomic balance for the country. Such indicators include a risk analysis tied to the implemented projection results. Additionally, an alternative development scenario with poorer economic growth is evaluated together with the baseline scenario.

Beyond the technical aspects, the proposed model incorporates the knowledge and expertise of the structural properties and performing characteristics of an economy. Simultaneously, the model avoids the use of heavy econometrics given its inherent challenges. This deliberate choice simplifies the statistical-mathematical apparatus of the model to the maximum extent. However, the model's complexity is accentuated in terms of the interconnection of balances, with the core of the model serving as a bridge linking the GDP usage, the "Balance of payments," and

the anticipated schedule of payment of public and private debt for the country [10, p. 43].

The novelty in this paper is the introduction of a dynamic analysis of external debt by determining which factors and to what extent contribute to the creation of external debt and performing sensitivity analysis.

Methodological framework

The detailed explanation of the methodology based on which the core model is developed with its assumptions is already provided in Kovačević & Stević [10]. Such a model has the capacity to facilitate its further extensions. One of them is the dynamic analysis of the country's external debt which is regarded as an important step in the examination of its debt sustainability as it helps identifying the factors that contribute to the country's external debt while simultaneously determining the direction and intensity of their influence. In that respect, the model was extended with a special (second) part called dynamic analysis of external debt (both in baseline and alternative scenarios) and the identification of factors that generate the debt.

The main aim of this kind of analysis is to understand how external debt is generated and pinpoint areas that need attention to mitigate the risk of excessive debt or repayment issues. Policymakers can use this information to devise strategies that enhance key economic indicators like exports, fiscal discipline, and domestic savings, thereby reducing reliance on external borrowing. Furthermore, understanding these factors enables policymakers to secure more favourable borrowing terms, such as lower interest rates and extended repayment periods, ultimately easing the debt servicing burden on the national budget and lowering external debt levels.

It is important to note that these factors vary from one country to another based on specific national characteristics and can change with both internal and international conditions. Common contributors to external debt include a high current account deficit, decreased foreign currency inflows due to reduced exports, currency depreciation, rising international interest rates, and political or economic instability (Table 1).

External debt sustainability refers to a country's capacity to meet its short-term and long-term debt obligations to foreign entities without requiring significant adjustments to its macroeconomic policies. Unlike fiscal sustainability, which focuses solely on government debt to both domestic and foreign entities, external debt sustainability considers the entire economy's debt, encompassing all sectors (government, non-financial, financial, and household) that may owe money to foreign creditors. Thus, external debt sustainability is a broader indicator of a nation's total indebtedness to foreign entities and reflects the overall financial stability of the economy. In essence, it is a critical measure of a country's economic health and stability.

Debt Sustainability Analysis (DSA) examines how a country's external debt situation changes over time in relation to indicators such as GDP, exports etc. or other measures of its ability to repay debt. To achieve debt sustainability, these ratios should eventually stabilize at reasonable levels by the end of the projection period at the latest, and should not become explosive thereafter [7, p. 42]. The trajectory of the ratio of external debt to GDP is influenced by several factors – domestic macroeconomic conditions, economic policy, including the structural

Table 1: Factors and their impact on external debt

Factor	Description of the influence
Large trade deficit	When a country runs a large trade deficit and relies on foreign capital to finance its consumption, it can quickly accumulate foreign debt.
Decrease in exports and consequent inflow of foreign currency	Countries that rely heavily on raw material exports or have a narrow export area may have difficulty generating enough foreign exchange to meet their external debt obligations.
Depreciation of the domestic currency	In the event of a depreciation of the domestic currency, the real value of the country's external debt may increase, making it difficult to service it.
High borrowing costs	High interest rates in the international capital market can make it difficult for countries to service their external debt, especially if they have high levels of debt.
Weak institutional and legal system	Countries with weak institutional and legal systems may have difficulty attracting foreign investment and may be more prone to default on their external debt.

Source: Authors' compilation based on IMF [7]

policies of the country, then, circumstances on global commodity markets and occurrences on international capital markets. If the ratio of external debt to GDP or external debt to exports does not stabilize at a reasonable level under reasonable macroeconomic assumptions, it may indicate that the country will face difficulties in servicing its external debt in the future [7, pp. 43-44]. This may be a cause for concern. In this sense, it is very important to provide an analytical basis for effective monitoring of external debt dynamics. Below is a methodological framework designed to serve this purpose.

Following the practice and recommendations of the International Monetary Fund in this area, the following framework for external debt sustainability analysis was adopted and adapted to the author's approach. The framework consists of two constitutive parts – (i) analysis of debt dynamics and identification of factors that generate debt and quantification of their impact in the form of their contributions and (ii) sensitivity tests, i.e. bound testing for input variables (interest rate on external debt; real growth rate; change in foreign exchange rate; deterioration of the current account of the Balance of payment; combined impact of the previously mentioned input variables) [7, p. 44].

Dynamics of external debt and factors that generate debt

The analysis of the dynamics of external debt includes the decomposition of the historical (realization) and projected dynamics of the country's debt. Decomposition (breakdown into key factors of external debt) is based on the debt dynamics equation, that is, the change in the state of external debt over time [7, p. 27].

However, for the purpose of analysing the sustainability of a country's external debt, it is necessary to focus on the non-interest bearing balance of the current account, which represents only one component of the Current account balance. The second component is the interest-bearing balance of the current account (balance of primary income based on interest inflows/outflows – interest receipts/payments). This is because interest payments are already reflected in the debt balance and debt service obligations, and therefore do not contribute directly to the accumulation of new external debt. On the other hand, when it comes to the financial account (FA) balance, it includes both debt-creating and non-debt-creating capital flows. Debt-creating capital inflows refer to borrowing from abroad, while non-debt-creating capital inflows include FDI-based equity investments and portfolio investments. The sum of the non-interest-bearing current account balance and capital inflows that do not create debt is equivalent to the total inflow of resources into the country that do not contribute to the increase in the country's external debt. Therefore, the sum of the non-interest-bearing balance of the current account and the inflow of capital that does not create debts represents the resources available to the country for financing its obligations based on external debt servicing and new investments without increasing the external debt balance [5, pp. 245-318].

Thus, the increase in external debt over time can be represented as follows:

$$D_t - D_{t-1} = r_t \times D_{t-1} - CAB_t \quad (1)$$

Rearranging of the identity leads to the following:

$$D_t = (1 + r_t) \times D_{t-1} - CAB_t \quad (2)$$

where CAB is the balance of the current account of the Balance of payments, without interest paid – the so-called non-interest-bearing current account of the balance of payments (that is, net export of goods and services increased by the balance of primary income without interest payments and the balance of secondary income, i.e. transfers with foreign countries); D_t – balance of external debt at the end of year t in foreign currency (EUR); r_t – nominal effective interest rate in foreign currency that the country pays on its external debt.

So, by dividing both sides of the identity (2) by (Y/e), we get the ratio of external debt to GDP, that is:

$$\frac{D_t}{(Y_t/e_t)} = (1 + r_t) \times \frac{D_{t-1}}{(Y_{t-1}/e_{t-1})} \times \frac{(Y_{t-1}/e_{t-1})}{(Y_t/e_t)} - \frac{CAB_t}{(Y_t/e_t)} \quad (3)$$

whereby $CAB_t = (X_t - M_t) + PI_t + SI_t$,

where X_t is export value, M_t is import value, PI_t is Net income from abroad, i.e. Balance of primary income, without interest payments, SI_t is value of Net current transfers, i.e. Balance of secondary income.

By further rearranging relation (3), the ratio of external debt to GDP in the current year is derived as

$d_t \times (1+g+\rho+g\times\rho) = (1+r)\, d_{t-1} - (1+g+\rho+g\times\rho)tb_t$ (4)

where, g denotes the growth rate of real GDP, r the nominal effective interest rate in foreign currency that the country pays on its foreign debt, ρ is GDP deflator in foreign currency and is the foreign trade balance of goods and service (relative to GDP in foreign currency) that must be covered by borrowing, i.e. the one that generates debt (in %GDP)[1], that is $tb_t = CAB_t/(Y_t/e_t)$ or $tb_t = [(X_t - M_t) + PI_t + SI_t]/(Y_t/e_t)$.

By final rearrangement of the equation, endogenous debt dynamics are derived:

$$d_t - d_{t-1} = \frac{(r - g - \rho - g\times\rho)}{(1 + g + \rho + g\times\rho)} \times d_{t-1} - tb_t \qquad (5)$$

where the growth rate of the value of the GDP deflator in foreign currency (in our case, in euro terms) was obtained as:

$$1 + p_t = [(\frac{Y_t}{e_t})/(\frac{Y_{t-1}}{e_{t-1}})]/(1+g_t) \qquad (6)$$

In the specific case, appreciation is defined as the nominal rate of change in the exchange rate of the dinar against the euro.

This kind of decomposition is useful for identifying the origin of the (in)stability of the external debt and arises mainly from the behaviour of interest rates, the growth rate of the economy, inflation or the movement of the real exchange rate, or through the adjustment of the primary, trade balance.

The main intention is to provide a tool that will help decision-makers to systematically examine the evolution of debt dynamics under alternative assumptions regarding macroeconomic trends, influences from the external environment, and political and social developments in the country.

Sensitivity analysis: Alternative scenarios and bound testing for input variables

The second building block of the proposed methodology is a sensitivity analysis of changes in input variables, such as *interest rates on external debt; real growth rate of GDP; exchange rate change; deterioration of the Current account of Balance of payment; the combined influence of the previously mentioned input variables.*

In fact, it is a set of standard sensitivity tests around a baseline scenario, which examine the implications of alternative assumptions about the aforementioned input variables. Detailed display of input variables with an explanation of sensitive tests is given in a separate chapter about External Debt Dynamics.

The first sensitivity test equalizes the key variables with their historical averages – this should allow insight into the ambition of the basic projection in relation to historical experience, that is, whether the adjustment provided by the baseline projection far exceeds the country's historical averages.

The second sensitivity test takes into account adverse shocks on individual variables in the amount of up to three standard deviations during the projection period, while the third test involves the so-called combined shock of several variables simultaneously.

Since the volatility of the real exchange rate can, historically speaking, be low due to the fixed exchange rate regime (this includes dirty float, as well as the crawling peg), an additional scenario in which there is a depreciation of the domestic currency of 30% is considered.

The predicted framework uses the mean plus ¼ to one standard deviation, as well as the scenario where the shocks occur simultaneously, with the understanding that further calibration of the sensitivity tests is likely to be necessary[2]. The need for further calibration in sensitivity testing arises for several reasons. In the first place, economic, geopolitical, or other conditions can change over time. Sensitivity tests conducted under one set of conditions may not be applicable or accurate when conditions change. Calibration is necessary to adapt the tests to these new circumstances. Also, in dynamic environments, new risks or factors may emerge that were not initially considered – these may need to be incorporated into the sensitivity tests to ensure a comprehensive analysis of potential outcomes. In the end, as more information becomes available or as the understanding of the system improves, models

1 Current account deficit that is not covered by net inflow of capital based on equity investments but is covered by net borrowing.

2 According to Chebyshev's inequality, for any well-defined probability distribution function, the probability of an outcome greater than k-standard deviations from the mean is less than $1/k^2$. Although this does not require any special assumptions about the distribution, it does, of course, assume that the sample mean and standard deviation provide a good estimate of the corresponding population moments.

used in sensitivity testing may need to be refined. Such calibration, in fact, helps update models to better reflect the underlying dynamics of the system.

In general, according to IMF recommendations, the previous ten years should be used to calculate the relevant averages and standard deviations, unless there were significant structural changes or shocks in this period (such as hyperinflation, currency crisis, etc.), in which case the five-year period may be more appropriate.

Results

Baseline scenario: Assumptions and underlying indicators

As a small and open economy, Serbia's macroeconomic policy is profoundly under the impact of both the global economic and geopolitical circumstances, especially those of its significant trading partners. The critical importance of foreign investments and the substantial inflow of credit capital are integral to Serbia's carefully chosen growth model. Nevertheless, during the previous period of chained global crises, Serbia has maintained fiscal flexibility, which has been crucial in enabling the government to respond adeptly to the challenges caused by COVID-19 and subsequent crises. Another significant asset for Serbian economy is the notable stability of the financial sector, characterized by the robust capital adequacy of the banking sector and substantial exchange reserves. Yet, the potential escalation of the Russian-Ukraine crisis and war in Gaza pose a grave threat, potentially jeopardizing further necessary adjustments and the subsequent recovery of the global economy.

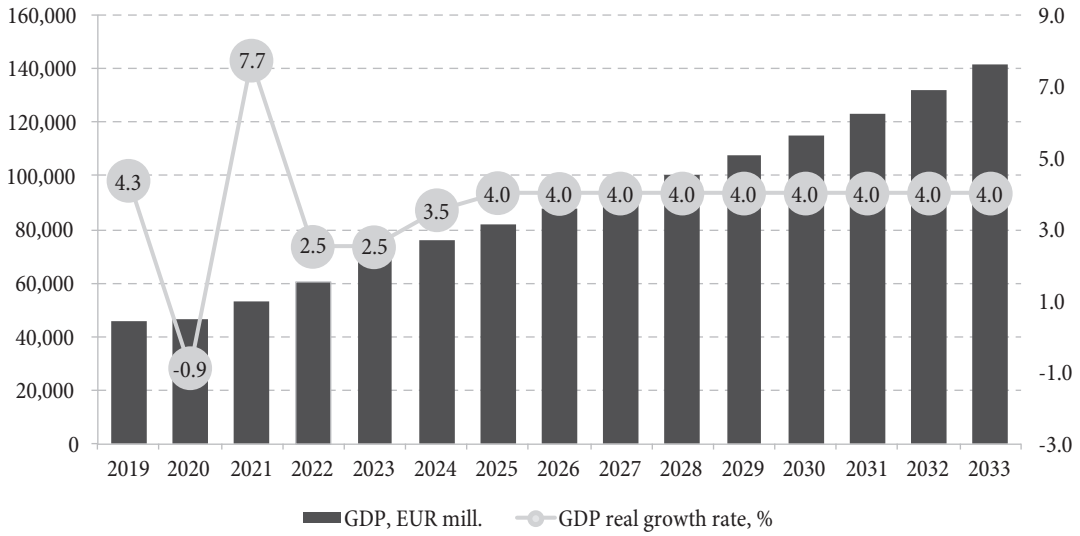
Main baseline model assumes that the GDP growth rate for the period 2024-2033 is equal to 3.9% in average.

According to the quarterly GDP estimation of the SORS, the estimated GDP growth rate in 2023 is 2.5%. The model also incorporated a growth rate of 3.5% in 2024 (Figure 1), which would be followed by continuity with a growth rate of 4% for the remaining projection period (from 2025 to 2033). In line with this growth trajectory, the GDP is projected to reach EUR 141.5 billion by 2033.

The chain of crises in the past period (Covid-19, the war in Ukraine, Israel-Hamas war in Gaza, the energy crisis, climate change, etc.) resulted in the deterioration of the foreign trade ratio for most European countries. It particularly concerns countries that are net importers of energy products. Serbia also belongs to this group – in 2022, the deficit of goods and services amounts to 11.7%, primarily due to the increase in import prices of energy sources (oil, oil derivatives and gas). In 2023, the proportion of the goods and services deficit fell to 5.2%, after which, it would recover to 7.0%, and in 2033, it would stop at 8.0%.

The key element in the movement of the proportion of the current transactions deficit of the balance of payments in GDP is the trend in the proportion of the goods and

Figure 1: GDP trends, 2019-2033



Source: Authors' calculations, SORS

services deficit (negative net exports). With the aimed share of net exports (8% throughout the entire projection period), the deficit values appear relatively consistent across the projection period, hovering around the range of -4.3% to -4.5%.

The target parameters in the basic development scenario are:

- increasing the share of gross fixed capital formation from an estimated 24.3% in 2024 to 27.0% in 2028 and 29% in 2033 (with an average annual growth of 6.7%),
- reduction of the share of state spending in GDP[3] from an estimated 17.0% in 2024 to 15.0% in 2033,
- increasing the proportions of goods and services exports in GDP, from an estimated 59.5% in 2024 to 65% in 2033,
- the current transactions deficit of the BoP stabilized at 4.5% of GDP in 2033.

Inflation rate in 2023 amounted to 12.1%. By the end of 2024, it would return to the inflation target range, giving an average inflation rate for that year of 4.0%. From 2027 until the rest of the projection horizon, inflation goal of the National Bank of Serbia would be reached, which is 3%. According to the baseline scenario, the exchange rate would be relatively stable, giving an average annual depreciation of the dinar of no more than 0.5% till the end of the projection horizon.

According to the model settings, the target share of gross fixed capital formation will be achieved if their average annual real growth amounts to 6.7% in the projection period (2024-2033).

The value of those investments would rise from an estimated 19.7 billion euros in 2024 to around 28.9 billion euros in 2028 and to around 43.5 billion euros in 2033. At the same time, the share of gross domestic savings in gross fixed capital formation would gradually increase from an estimated 49.9% in 2024 to 59.8% in 2033 (Figure 2).

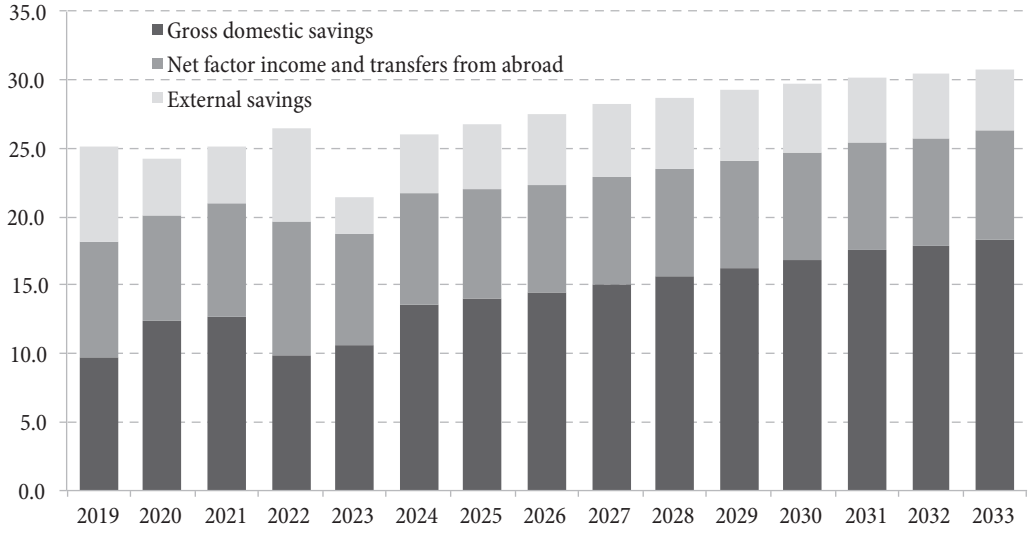
With the aimed proportions of net exports (at 8% over the rest of the projection horizon), final demand grows more slowly than GDP. In line with this, the following growth rates are recorded during the ten-year projection horizon: GDP of 3.9%, Final consumption of 3.3%, and GFCF of 6.7%

The residual item from setting up the target value for net exports and GFCF is household consumption. Its proportion in GDP fell from 65.7% in 2023 down to 64.2% in 2027 and 62.3% in 2033.

This means that the model also targets government spending. In the specific case, the targeted proportion of state spending in GDP, from an estimated 17.2% in 2023, drops to 15.0% in 2032 (Figure 3).

3 State consumption is expressed as the sum of collective state consumption (a component of the expenditure side of GDP according to the System of National Accounts – SNA) and individual state consumption (also a component of the expenditure side of GDP as a part of total individual consumption – education, health, etc.). This implies that household consumption, as an aggregate of individual consumption, is reduced by the amount of individual state consumption.

Figure 2: Gross fixed capital formation by financial resources, Republic of Serbia, % GDP



Source: Authors' calculations, SORS

The projected changes in the structure of GDP use require high import growth rates and accordingly the high level of the export target – from an estimated 59.5% in 2024 to 65% in 2033. In this structure, the dominance of consumption growth from 2022 (a consequence of the growth of domestic demand for foreign goods as well as the growth of import prices of energy sources, etc.) and 2023 is replaced by the dominance of investment growth from 2024, until the end of the projection period (Figure 4).

The next set of assumptions relates to the country's balance of payments projections. In essence, the model of macroeconomic projections used for the analysis required that a balance of payments projection model be developed first. Within this model, the following (main) target parameters were set: raising the proportion of goods and services exports in GDP to 65% in 2033 (Figure 5) and restricting the fall of number of months in which foreign exchange reserves will be enough to cover the country's imports to about 4.2 months by the end of the projection horizon.

Also, it is projected that in the period 2024-2033 the cumulative net inflow of capital based on foreign direct investments will reach 55.6 billion euros. In the same period, the cumulative amount of the deficit of current transactions is around 51.4 billion euros, which did not

Figure 3: Household and general government consumption, and gross fixed capital formation, Republic of Serbia, 2019-2033, in %

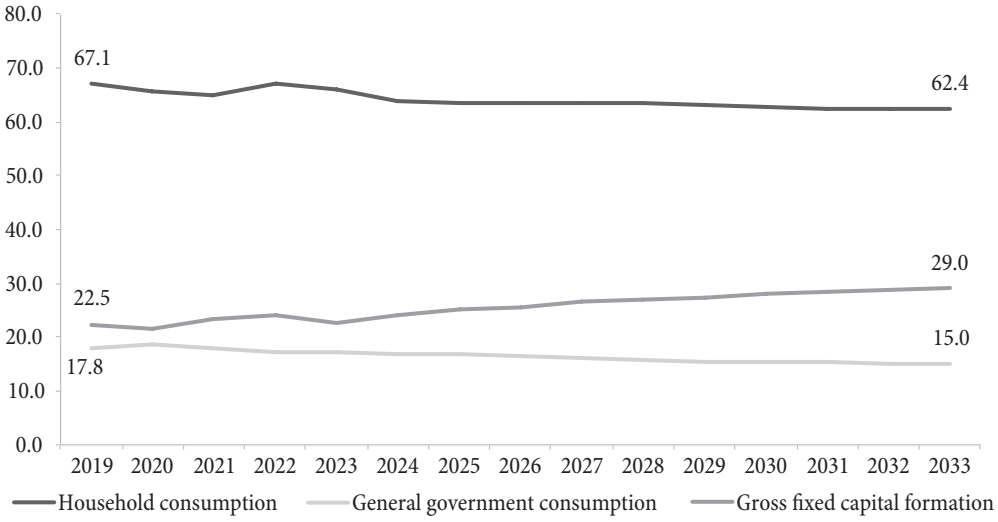
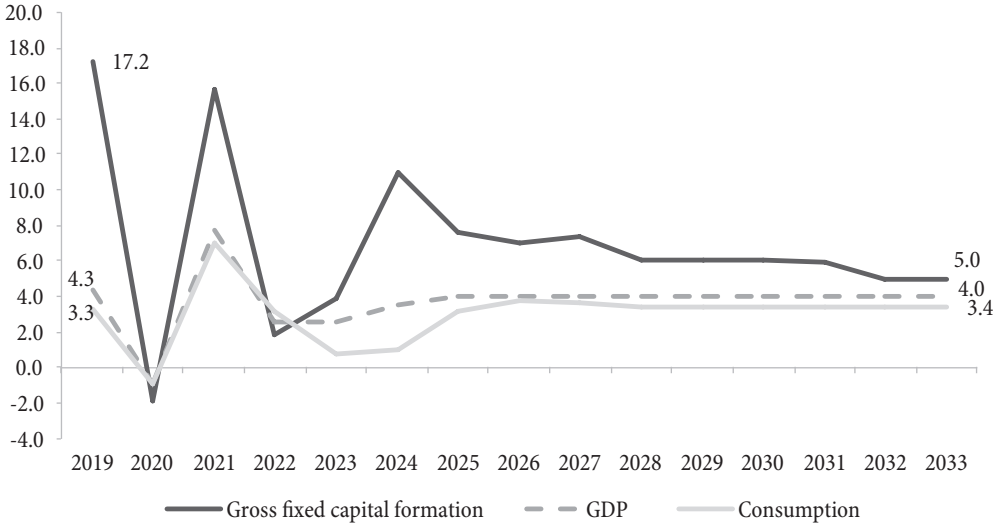


Figure 4: Year-on-year real growth of GDP, GFCF and consumption, Republic of Serbia, 2019-2033, %



Source: Authors' calculations, SORS

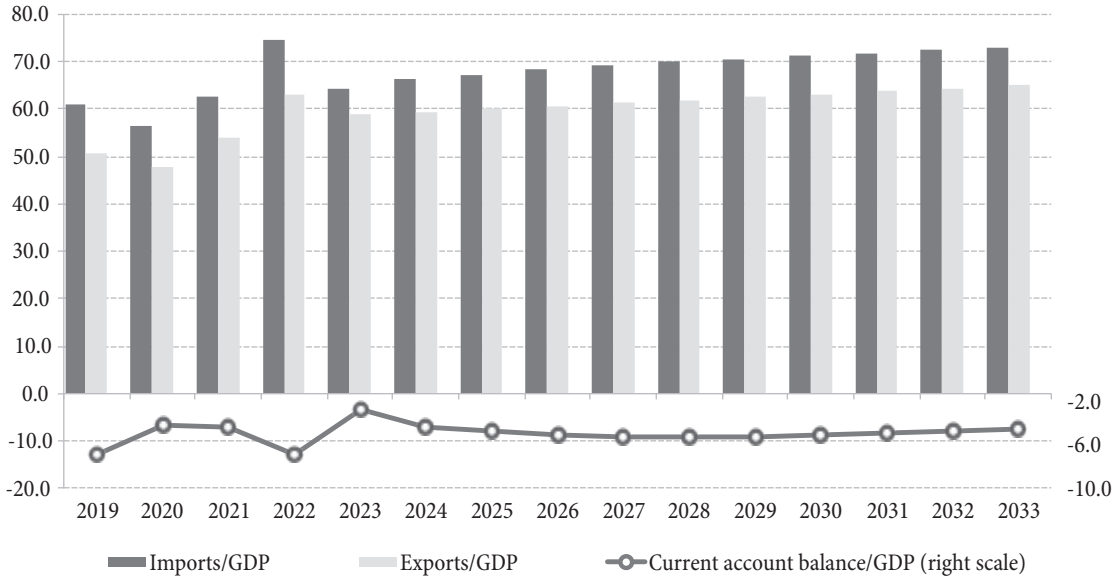
take into account possible donations, which would have eased the situation.

Based on the provided macroeconomic forecasts for GDP and its components of expenditure and balance of payments, the fiscal projections for the period 2024-2033 were calculated.

The greatest attention is paid to the projections of the most significant items of the revenues and expenditures inside the budget – the items with the largest shares in budget revenues and expenditures. Thus, on the revenue side, it was necessary to forecast the movement of income from value added tax as precisely as possible, bearing in mind the largest share of this item in total income. Since this type of tax belongs to consumption taxes, its movement is presumed to follow domestic demand. Additionally, total revenues from VAT consist of importing VAT and VAT from the domestic market. In this regard, it was assumed in the forecasts that VAT incomes from imports will move in accordance with the movement of imports (the corrective element is a coefficient that reflects the relationship between the dynamics of exports and imports, as exported goods are liable to VAT refunds). VAT-based income for the domestic market is determined by subtracting VAT-based income from imports from the overall VAT-based income. In addition, the projection for customs duties income is based on import growth rates, while other revenue items in the budget are presumed to correlate with GDP movements [10].

Regarding budget expenditures, projections were based on anticipated growth rates in consumption by the general government sector. This primarily includes expenses related to consumption, such as employee remuneration, budgetary transfers (with the largest portion going to the Pension and Disability Fund), and social benefits. Additionally, capital expenditures are expected to align with a targeted share of 5.5% of GDP. When estimating pension costs, we considered an upper limit based on fiscal rules outlined in the 2023 Law on the Budget System. According to these rules, the total amount of pensions paid should not exceed 10% of GDP. This means that the government aims to control and limit the proportion of GDP allocated to pension payments. Thus, if these expenses and the monetary amount as an increase for pension are between 10% and 10.5% of GDP, the pension is adjusted to the sum of half of the change in the average salary without taxes and contributions and half of the change in consumer prices. Furthermore, if the total expenditure for pensions and the monetary amount as a pension increase are equal to or greater than 10.5% of GDP, the pension is adjusted only to consumer prices, that is, there is no real increase in pensions, but only their real value is maintained. These set rules for adjusting pensions represent a form of macroeconomic

Figure 5: Current transactions deficit, Republic of Serbia, 2019-2033, % of GDP



Source: Authors' calculations, SORS

automatic stabilizer. Their goal is to provide for the fiscal sustainability of the pension system. When it comes to the proportion of general government salaries in GDP, according to the new fiscal rules, a new upper limit of 10% has been set. In summary, the concept of automatic stabilizers is introduced to highlight the system's ability to adapt to economic conditions without constant manual adjustments. Also, the SORS demographic projections on the population size for the corresponding age groups were taken into account as a benchmark (65+) so as to provide for additional control of the acceptability of the obtained fiscal projections.

Assuming no changes to existing tax rates, the proportion of consolidated public revenues in GDP will equalize at 41.1%. Simultaneously, public expenditures as a percentage of GDP are projected to decline from an estimated 45.7% in 2023 to approximately 40.0% by 2033. This reduction would lead to a budget surplus equivalent to around 0.5% of GDP at the end of the projection period. To promote economic growth, a substantial increase in public infrastructure investments is recommended. These investments would not only have direct effects but also indirectly stimulate private investment growth. As part of this strategy, the target share for public investments has been set at 5.5% of GDP by the end of the projection horizon, with the aim of ensuring a downward trajectory for public debt.

Although the estimated share of public investments reached 7.2% of GDP in 2023, a gradual decrease of this share in the following period is advised so that the sustainability of the public debt is not threatened. Otherwise, such high shares of public investments would require additional external borrowing of the country. This must be considered as Serbia is preparing for Expo 2027. According to fiscal projections, it should be expected that the target share of public investments of 5.5% will be reached in 2029, remaining as such over the entire remaining period of projections.

The starting position in 2023 is a fiscal deficit of 2.8% of GDP as a result of high allocations for the acquisition of financial assets, intended to overcome the negative effects of the energy crisis. In 2024, it is estimated to be at 2.4% of GDP. In the following period, a gradual reduction of this deficit would follow, so that a surplus of 0.2% of GDP would be achieved from 2033. This result stems from the premise fitted into the projecting of expenditure elements of the GDP, which concern the adjustment of public spending, that is, the relative decline (compared to GDP) of current public spending. Namely, one of the assumptions of the model is the reduction of the percentage of state spending in GDP from an estimated 17.0% in 2024 to 15.0% in 2033. However, in the initial years of the projecting period, due to overdue repayments based on foreign borrowing, as well as the fact that the main components of public spending – salaries in the public sector (from the budget) and pensions – are difficult to adjust, fiscal deficits would still be recorded [7, p. 18].

Results of baseline scenario and risks attached to its implementation

The overall sustainability of a particular economic development scenario faces its greatest risk in terms of external debt sustainability and liquidity. In the relevant macroeconomic literature, various indicators are employed to analyse external debt sustainability. For the sake of this paper, we focus on three specific groups of indicators: (i) external liquidity, (ii) external solvency, and (iii) measures of national economic openness.

As for external liquidity, we start with Total external debt service ratio which is defined as a proportion of capital and interest repayment in exports of goods and services.

In 2023, the debt service ratio is estimated to be 16.2%. By 2024, it is projected to decrease to approximately 14.0%. These elevated rates result from obligations (including interest and capital) stemming from earlier indebtedness. Subsequently, the ratio tends to decline annually, except for 2027 and 2029, when it rises by 0.5 percentage point and 0.3 percentage point from the previous years, respectively. In the final year of the ten-year projecting period, the ratio reaches 7.0%. During the initial years of the projection, there is a notable risk of heavy external debt repayment burdens. Addressing this risk requires robust investment activity, driven by substantial growth in domestic savings for financing investments, followed by foreign direct investment.

The second indicator within this group is Foreign exchange reserves by months of imports which specifies the number of months during which a country can sustain the ongoing volume of imports in case all inflows are halted.

The coverage of goods and services imports by foreign exchange reserves is expected to decrease from an estimated 6.3 months in 2024 to approximately 4.2 months in 2033. This adjustment aligns with the reduced risk related to external liquidity (Figure 6).

The changes in the foreign exchange reserves-to-imports ratio take into account robust external liquidity and the country's credit rating, which facilitates more cost-effective borrowing (lower capital costs). In line with Standard & Poor's methodology, Serbia's current credit rating for long-term borrowing stands at BB with a positive outlook.

Assuming unchanged conditions, replacing the consumption-oriented development scenario with a pro-investment approach (the baseline scenario) and shifting investment focus toward tradable goods can lead Serbia to attain an investment-grade credit rating. This achievement would grant access to more affordable capital for financing the chosen growth and development model. However, it is worth noting that due to a significant inflation surge in certain major global economies, central banks are likely to raise their key interest rates.

Regarding External solvency of the country, the obtained results show that the external debt-to-exports ratio in 2024 stands at 107.0%, which falls within sustainability limits of 220%. Over the projection period, this ratio gradually decreases, reaching 62.6% by 2033. This trend reflects a positive trajectory in managing external debt relative to exports of goods and services. The next indicator

Figure 6: Foreign exchange reserves and imports coverage, 2019-2033, GDP %

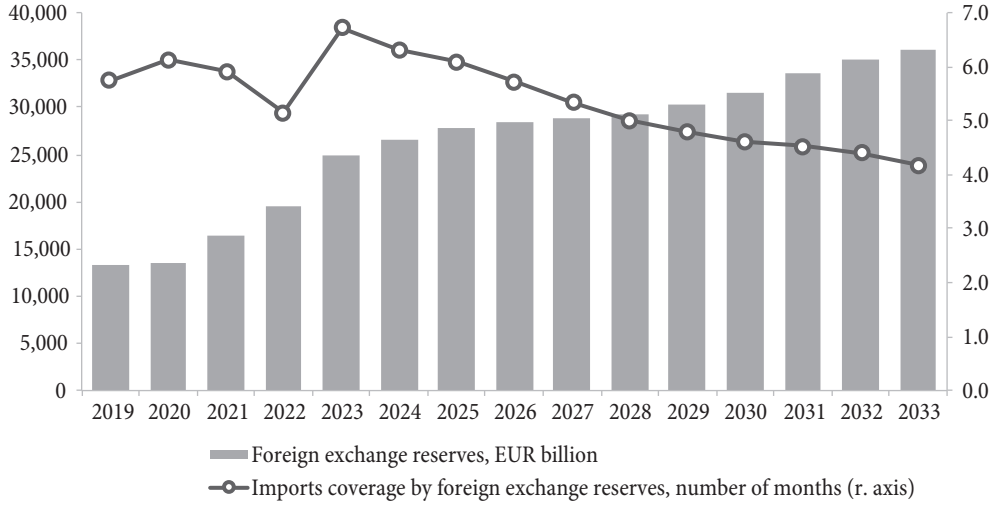
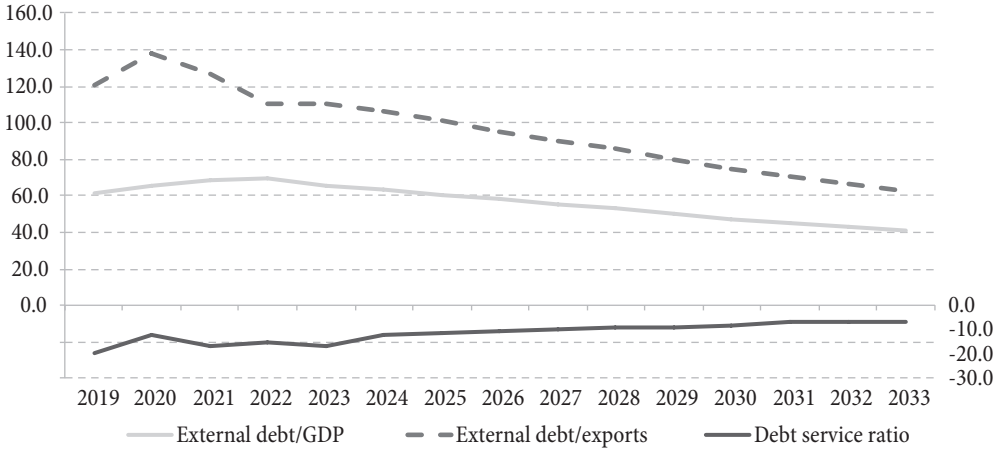


Figure 7: External indebtedness indicators, 2019-2033, %



Source: Authors' calculations, SORS

of the external solvency is an external debt-to-GDP ratio. According to the results of the projections, while the absolute value of external debt is increasing annually, its relative share in GDP has declined to 40.7% (Figure 7).

In this paper, the trade openness of the country is described with the help of two indicators – Foreign direct investment-to-GDP ratio and External trade-to-GDP ratio. Thus, in 2024, foreign direct investment (FDI) is projected to constitute 6.0% of GDP. However, by 2029, this share is expected to gradually decline to 5.0% and remain so by the end of 2033. The reduction in FDI share during the later years of the projection horizon is attributed to potential profit outflows. The projected net FDI inflow for the period from 2024 to 2033 amounts to EUR 55.6 billion. Conversely, the cumulative deficit of current transactions during the same period totals nearly EUR 51.4 billion.

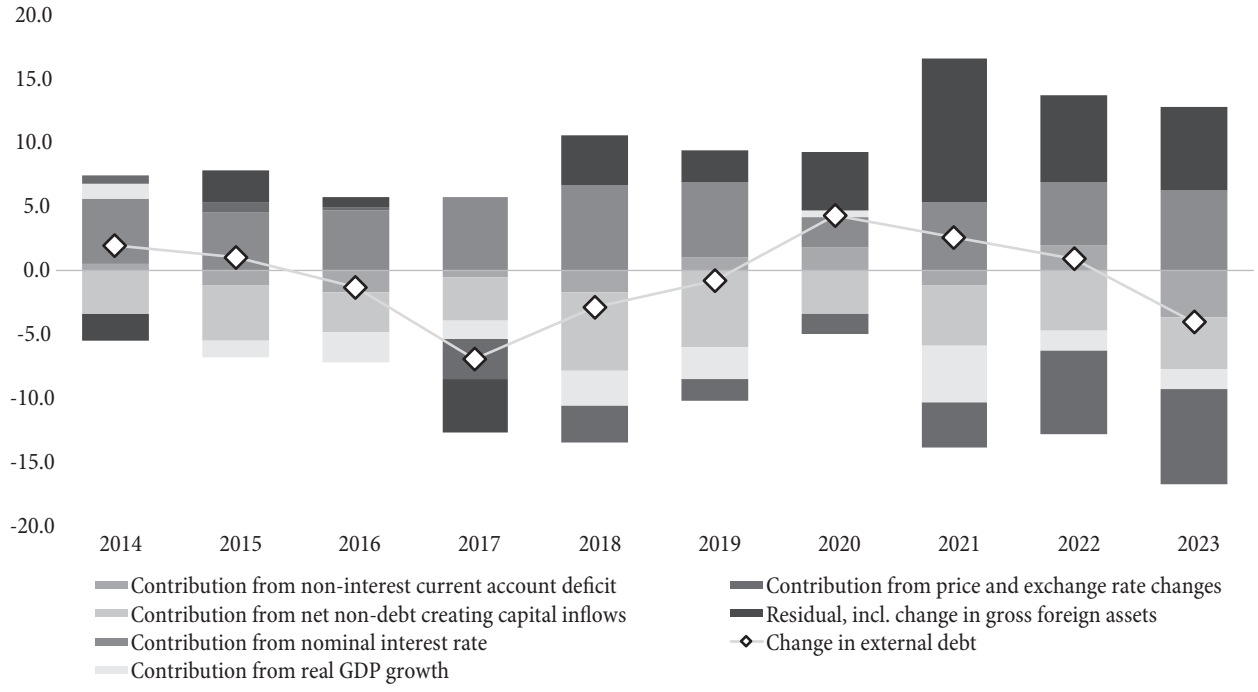
Additionally, the degree of economic openness, as measured by the external trade-to-GDP ratio (which combines exports and imports), is expected to rise from an estimated 120.6% in 2024 to 139.0% in 2033. This indicates a high level of trade openness throughout the entire period of projections.

Regarding risks that may produce deteriorating macroeconomic conditions and as a result jeopardize a chosen model of economic development, it is useful to distinguish between two types of risks: international environment risks and internal risks. The former includes potential challenges such as geopolitical tensions, climate change, pandemics, cybersecurity threats, etc. These adversities have the potential to create uncertainty, causing reduced investor confidence and their reluctance to invest abroad. As a result of this, countries which still relies upon foreign investments, such as Serbia, may find themselves in a situation where investors withdraw their capital – such capital outflow can lead to debt crisis. Internal risks, on the other hand, may involve the country opting for consumption-driven growth model instead of pro-investment model, declining FDI inflows, external debt payment issues, unfavourable demographic trends such as falling birth rates and an aging working-age population, as well as political risks.

External debt dynamics and factors generating Serbia's external debt

In this part of the paper, the basic flows that lead to changes in external debt are shown, as well as their contribution to changes in the country's relative indebtedness in the baseline development scenario.

Figure 8: Dynamics of the External Debt and its drivers – contributions to the change in the external debt as GDP % – historical data for Serbia, 2014-2023, %



Source: Authors' calculations, SORS

According to the obtained results, in the baseline scenario there is a softening of the flows that create changes in the share of external debt in the future, which leads to the conclusion about the sustainability of Serbian external debt. However, residual trends had a strong influence on the dynamics of Serbia's relative indebtedness in the historical period from 2014 to 2023 (Figure 8). Their contribution to the movement of the share of external debt was mostly positive (except in 2014 and 2017 when it was negative), while in some years it was dominant (in 2020, 2021 and 2022).

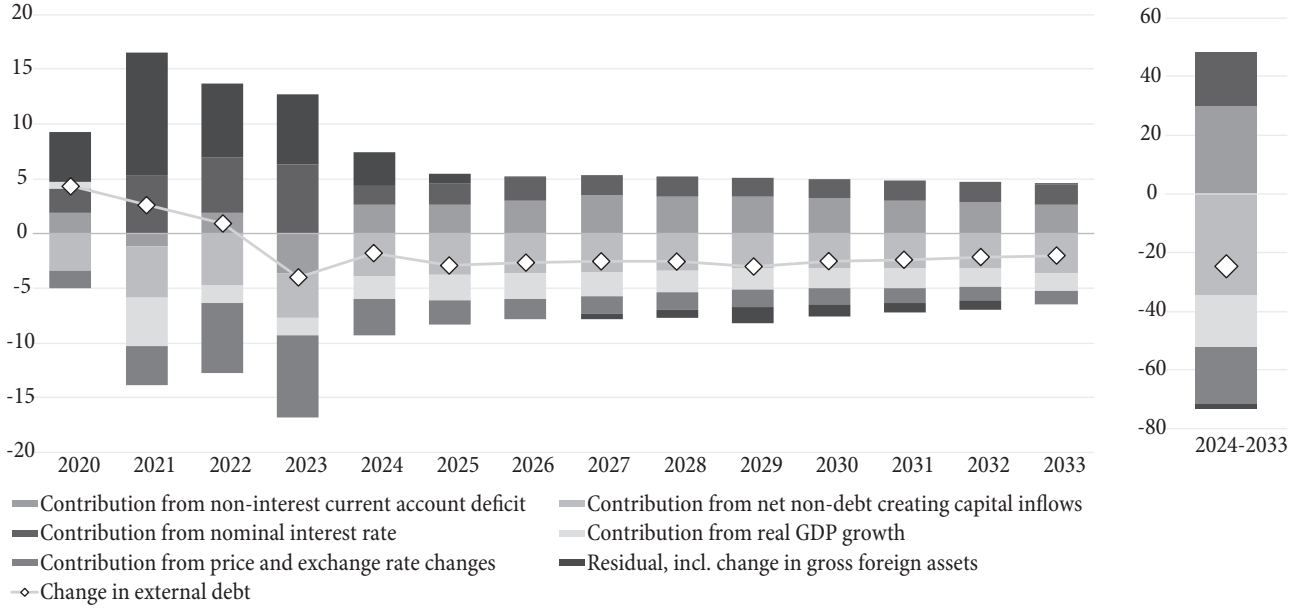
Given that residual flows are considered to be everything that contributes to a change in the country's relative indebtedness, and cannot be irrefutably explained by statistically recorded macroeconomic flows that cause the creation of external debt, it can be assumed that the increase in the share of external debt in GDP, which cannot be explained, results from challenges in the statistical measuring of the public sector activities, or problems arising from the application of the cash flow principle in general government financial statistics. This is particularly true of public debt. In addition, the residuals are probably also a consequence of the change in the ratio of the exchange rates of the currencies from which the debt is composed – namely, it is possible for a change in the debt expressed in one currency to occur without a corresponding change in the flows that cause the creation of external debt.

The projections were based on the assumption that these residual flows w weaken in the future because their better statistical coverage is expected, as well as the stabilization of the relationship between the main currencies (primarily between the euro and the US dollar).

The increase in the share of external debt in GDP during 2022 is mainly due to a larger than expected current account deficit (6.9% of GDP) and lower GDP growth (2.5%). However, according to the baseline scenario (Figure 9), it is expected that in the coming years the current account will improve and reach a deficit of 4.5% of GDP by 2033. At the same time, it is expected that after 2025, economic growth will reach a rate of 4% per year and remain on that trajectory by the end of 2033. Therefore, the resulting debt-to-GDP trajectory can be considered sustainable.

Regarding sensitivity analysis, it involves comparing the trajectory of the share of external debt (dt) obtained in the baseline scenario with the trajectories obtained in different scenarios. In this case, the sensitivity analysis consists of two alternative scenarios and four band tests (Table 2).

Figure 9: Dynamics of the External Debt and its drivers – contributions to the change in the external debt as GDP % in the baseline scenario, 2020-2033, %



Source: Authors' calculations, SORS

Results of the stress tests for the share of external debt in GDP

The results of the External Debt sustainability analysis provided in the previous section indicate that Serbia is at a moderate debt risk and that the external debt is sustainable. The external debt is on a sustainable path in the baseline scenario, and the results of stress tests show that debt dynamics are resistant to individual shocks (changes in interest rates, real GDP growth rates, GDP deflators and to a lesser extent in the deficit of the non-interest-bearing current account of the balance of payments). Nevertheless, the outlook for external debt is particularly sensitive to the shock of a one-time depreciation of the dinar (a sudden jump to 85.6% in 2026) and combined permanent shocks (heuristic variant and Test 5, see Table 2), which can lead to unsustainable trajectories and thus the need for the reprogramming the country's debt in the medium term. A similar situation is in case of the second scenario, which combines shocks on several key variables, adding the assumption of a change in FDI inflows, analogous to the approach in the heuristic model of the authors for the pessimistic scenario. This scenario is based on the disturbance of the GDP growth rate, the inflow of foreign direct investments, the nominal interest rate on external debt, the exchange rate, and the inflation (through the GDP deflator in euros), and the deficit of the non-interest-bearing current account of the balance of payments. In such a situation, the share of external debt in GDP grows throughout the entire projection period, with a significant increase in the share of debt reaching 71.4 % of GDP in 2033, which is still below the limit of the IMF and WB (dark grey line in Figure 10).

Namely, the poor performance of exports and the further growth of the current account deficit, together with the depreciation of the dinar, may threaten the sustainability of the debt. Decision-makers should therefore monitor trends in external debt indicators such as interest rates on external debt, real growth rate of GDP, exchange rate change, deterioration of the Current Account of Balance of Payment as well as their combined influence. Uncertainty regarding the global economic perspective and the consequences of the war in Ukraine will also have negative implications for a large number of countries,

Table 2: Sensitivity analysis – definition of alternative scenarios and description of the band tests

Alternative scenarios	Description
Scenario 1	All key variables remain at the 10-year historical average over the projection period (2024-2033) 1/
Scenario 2	Combined shocks on the variables with the inclusion of changes in FDI following the approach in setting the pessimistic variant in the author's heuristic model 2/
Bound tests	
Test 1	Increase in the interest rate on external debt by one standard deviation* compared to the base scenario during the projection period (2024-2033).
Test 2	Reduction of the real GDP growth rate by one standard deviation* compared to the baseline scenario during the projection period (2024-2033).
Test 3	Shock of the GDP deflator in euro terms for half a standard deviation* of the deflator in dinars and the exchange rate compared to the base scenario during the projection period (2024-2033).
Test 4	An increase in the deficit of the non-interest-bearing current account by one standard deviation* of the dinar deflator and the exchange rate compared to the baseline scenario during the projection period (2024-2033).
Test 5	Combined shocks of previous scenarios – growth rates of real GDP and non-interest-bearing current account deficit in the amount of 1/2 standard deviation*, and interest rates and GDP deflator in EUR in the amount of 1/4 of a standard deviation* compared to the basic scenario during the period projection (2024-2033).
Test 6	One-time depreciation of the dinar of 30% in 2026

* The standard deviation is calculated based on historical data over the past 10 years.

1/ Scenario of historical averages – interest rate on external debt, real GDP growth rate, GDP deflator growth in euro, non-interest-bearing current account deficit of the balance of payments and flows that do not create external debt as a % of GDP are expressed according to their historical values in period from 2014 to 2023.

2/ Under this scenario, the standard test with combined shocks is extended with the change in FDI. Thus, the real GDP growth rate and the non-interest-bearing current account deficit remain half a standard deviation below the 10-year historical average; the interest rate on external debt, the share of net FDI inflows, and the growth of the GDP deflator in EUR remain 1/4 of a percentage point below the 10-year historical average.

Source: Authors' calculations, SORS

especially net energy importers – Serbia belongs to this group. At the same time, it is expected that EU economies will record significantly lower growth rates, potentially resulting in reduced foreign demand for Serbian goods and services. To ensure debt sustainability and prevent the need for sudden macroeconomic policy corrections, decision-makers should carefully manage public finances and external borrowing.

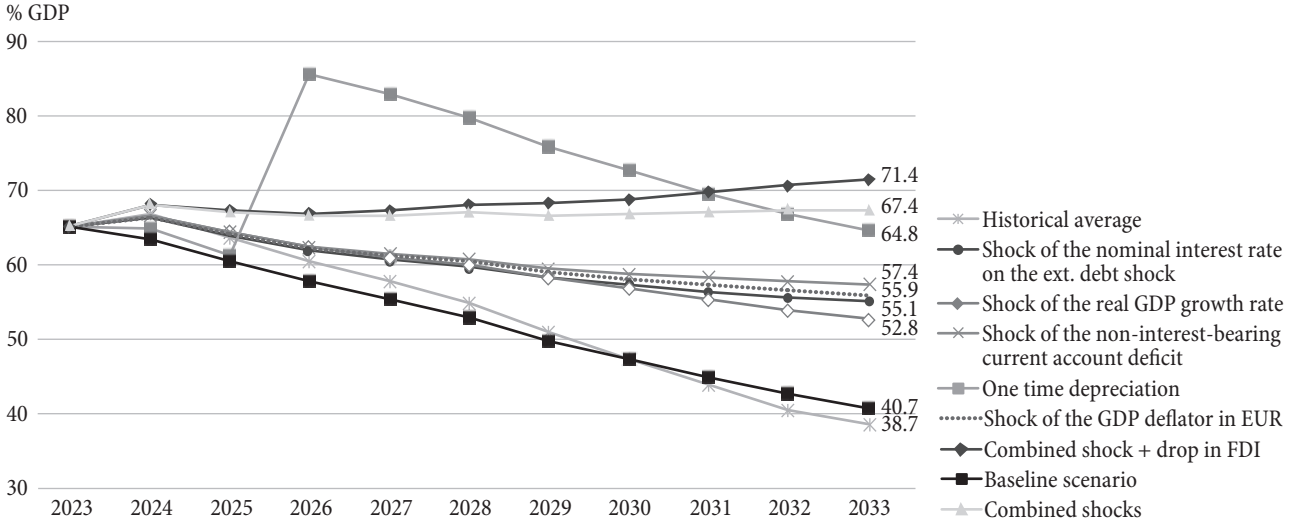
Currently, foreign exchange reserves are adequate and provide sufficient reserves to mitigate the impact of external shocks. However, policymakers should remain committed to sound macroeconomic policies and further build buffers to avoid debt problems. More importantly, to meet the country's fiscal needs without jeopardizing debt sustainability, further efforts are needed to strengthen public debt management, create additional fiscal space to increase productive investments at the expense of unproductive consumption. It is also necessary to further adjust structural policies with the aim of increasing the competitiveness of the national economy, greater participation of private investments in total investments, as well as greater commitment to institutional reforms (primarily regarding judiciary, education, and health system). This is important to ensure that the debt trajectory remains sustainable.

The dynamics of the share of external debt in GDP according to the baseline scenario is shown by the black line in Figure 10.

Deviation from the baseline projection – pessimistic scenario of economic growth: As a replacement for the concluding remarks

In contrast to the baseline scenario, the alternative outlook predicts slower economic growth. The annual growth rate from 2024 to 2033 is projected to be 2.0% in average. Additionally, the alternative scenario assumes an increasing share of the current transactions deficit in GDP, rising from 4.3% in 2024 to 6.4% in 2033.

Figure 10: Share of external debt in GDP in selected scenarios (two alternative scenarios and six band tests)*



Source: Authors' calculations, SORS

* *Combined shocks* in Figure 10 implies the combination of the following shocks: the real GDP growth rate and the non-interest-bearing current account deficit remain half a standard deviation below the 10-year historical average; the interest rate on external debt, the share of net FDI inflows, and the growth of the GDP deflator in EUR remain 1/4 of a percentage point below the 10-year historical average.
However, all the elements of Figure 10 are elaborated in Table 2.
The term *"non-interest bearing"* indicates that the deficit does not result in additional interest payments or debt service costs. In some cases, a country may be able to sustain a non-interest-bearing current account deficit in whole or in part if it is financed through non-debt creating means, such as foreign direct investment, foreign aid, or other forms of capital flows that do not require interest payments.
Inward Unilateral Transfers are transfers of money, goods, or services that flow into a country without the expectation of a quid pro quo. Inward unilateral transfers typically include items such as foreign aid, grants, remittances from overseas workers, and gifts. These transfers contribute positively to the receiving country's balance of payments. Conversely, *outward unilateral transfers* are transfers of resources or funds that a country makes to another country without expecting anything in return. This category includes foreign aid provided by the country, grants given to other nations, and other forms of assistance that involve the outflow of resources. Outward unilateral transfers have a negative impact on the country's balance of payments.

Figure 11: Cumulative GDP growth, 2024-2033, %

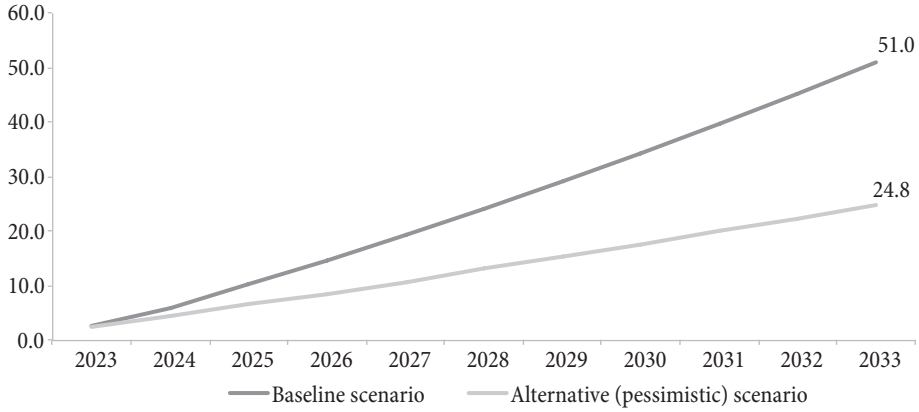
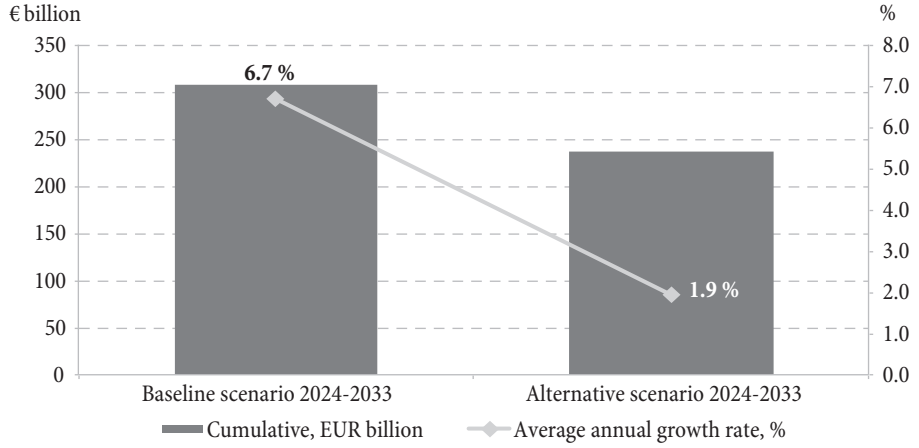


Figure 12: Gross fixed investments – cumulative and average annual growth rate, 2024-2033



Source: Authors' calculations, SORS

Targeted variables in the pessimistic development scenario include:

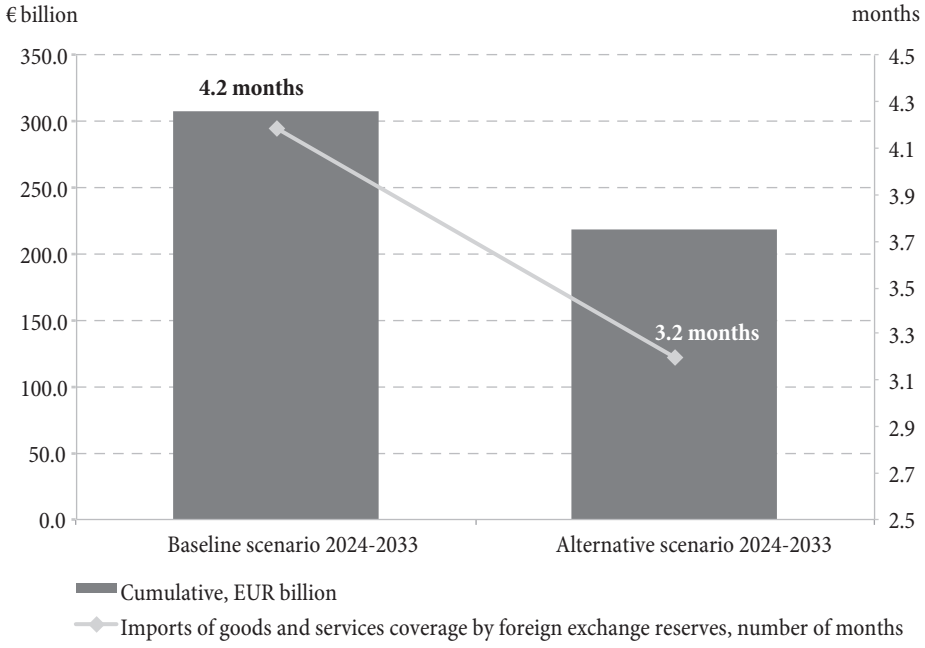
- Fixed investments maintaining a level of 23.7% GDP in 2024 until 2027, gradually declining to 22% GDP by 2033 (average annual growth of 1.9%)
- State consumption remaining at 17.0% of GDP throughout the entire projecting period
- Exports of goods and services decreasing from 59.5% GDP in 2024 to 55.0% GDP in 2033.
- A growing deficit in current transactions, reaching 6.4% of GDP by 2033.

Net exports are targeted at 7% throughout the projection, resulting in faster growth of final demands compared to GDP. The average annual growth rates for 2024-2033 are as follows: GDP with 2.0%, final consumption with 2.1%, and investments with 1.9%.

The alternative scenario, characterized by a low average annual growth rate of 2.0% and increased consumption, leads to inflation and RSD depreciation. By 2025, foreign exchange reserves would decline, reaching only 3.2 months of import coverage (from an initial 6.0 months). Borrowing at high interest rates becomes an alternative to depleting reserves. Consequently, external liquidity weakens, impacting long-term solvency. In this scenario, the external debt-to-exports ratio would reach 110.2% in 2033, with external debt comprising 61.8% of GDP. Reduced exports (from 59.5% in 2024 to 55.0% in 2033) contribute to decreased economic openness (from 125.3% to 118.0%). The deficit challenges economic structure and competitiveness. Lower GDP growth (2.0% vs. 3.9%) limits consumption growth to 2.1% annually. The alternative scenario predicts a decrease of EUR 6.9 billion in real GDP (at constant 2023 prices)[4] from 2024 to 2033 (Figure 11).

4 For further explanations on GDP calculations in constant prices see Kovacević & Stevović [10].

Figure 13: Foreign exchange reserves – cumulative and imports of goods and services, 2024-2033



Source: Authors' calculations, SORS

In the alternative scenario, investment growth averages approximately 1.9% annually, significantly lower than the baseline projection of 6.7% (Figure 12). As a result, cumulative investments over the projection period would decrease by EUR 71.0 billion. At the same time, the amount of cumulative foreign direct investment (FDI), would be reduced by approximately EUR 11.6 billion.

As shown in Figure 13, the amount of foreign exchange reserves would fall by EUR 87.9 billion compared to the baseline scenario. Simultaneously, they would be enough for approximately 3.2 months which contrasts with the 4.2 months projected in the baseline scenario.

In the alternative scenario, rather than depleting foreign exchange reserves, the country may resort to borrowing at high interest rates. However, this approach risks breaking external liquidity due to those elevated rates. Over the long term, the country's external solvency would deteriorate. Specifically, in the alternative scenario, the external debt-to-exports ratio would reach 110.2% by 2033, with external debt constituting 61.8% of GDP. Given this context, Serbia, still in the midst of reforms, must navigate two interconnected U-turns for sustainable growth. The first shift involves moving from consumption-driven to pro-investment and export-led economic growth. Simultaneously, accelerated reforms and European integration are essential for achieving this new growth model [9, p. 25].

References

1. Addison, D. (1989). *The World Bank revised minimum standard model (RMSM): concepts and issues* (Policy Research Working Paper Series. No 231). Washington: The World Bank.
2. Eurostat. (2013). *European System of Accounts – ESA 2010*. Luxembourg: European Commission.
3. Feenstra, R. C., & Taylor A. M. (2012). *International economics*. Third edition. New York: Macmillan (567-713).
4. Grupa autora. (2011). *Postkrizni model ekonomskog rasta i razvoja Srbije 2011-2020*. Beograd: USAID-SEGA.
5. IMF Institute for Capacity Development. (2013). *Financial programming and policies*. "The Policy Scenario" Part III in Volume I, Washington: International Monetary Fund.
6. International Monetary Fund. (2009). *Balance of payments manual (BPM6)*. Sixth edition. Washington: International Monetary Fund.
7. International Monetary Fund. (2002). *Assessing Sustainability, Prepared by the Policy Development and Review Department*. Retrieved from: http://www.imf.org/external/np/pdr/sus/2002/eng/052802.htm
8. Kovačević, M., & Stamenković, S. (2010). Methodological Basis for Macroeconomic Projections in Countries Exposed to Pressures and Shocks: Example of Serbia. *Panoeconomicus, 57*(2), 225-243.
9. Kovačević, M., & Stevović, M. (2019). *Model of macroeconomic projection for testing long-term debt and growth performances sustainability, 2019-2030*. Trends. Belgrade: Statistical Office of the Republic of Serbia.

10. Kovačević, M., & Stevović, M. (2022). Serbia 2030: Debt Sustainability and Growth Performance Testing. Ekomomika preduzeća, *70*(1-2), 41-56. DOI: 10.5937/EKOPRE2202041K
11. Ministarstvo finansija Republike Srbije. (2023). *Revidirana Fiskalna strategija za 2024. godinu sa projekcijama za 2025. i 2026. godinu*. Retrieved from https://mfin.gov.rs/dokumenti2/revidirana-fiskalna-strategija-za-2024-godinu-sa-projekcijama-za-2025-i-2026-godinu
12. Ministry of Finance. (2023). *Economic Reform Programme for the Period from 2023 to 2025*. Retrieved from https://mfin.gov.rs/en/documents2-2/economic-reform-program-erp-2
13. Polak. (1957). *Monetary Analysis of Income Formation and Payments Problems* (Staff Papers International Monetary Fund). Retrieved from http://www.jstor.org/stable/3866128?origin=pubexport
14. United Nations Statistical Commission. (2009). *System of National Accounts 2008*. New York: United Nations.
15. Law on budget of the Republic of Serbia for 2023, The Official Gazette RS, No.138/2022. Retrieved from https://www.paragraf.rs/propisi/zakon-o-budzetu-republike-srbije.html

Miladin Kovačević

served as the Director of the Statistical Office of the Republic of Serbia and as a member of the Council of the Governor of the National Bank of Serbia. He graduated from the Faculty of Mathematics, University of Belgrade, earning his BSc degree in Theoretical Mathematics in 1976. He then obtained his master's degree in Statistics from the Faculty of Economics at the University of Zagreb in 1978 and finally received his PhD in Statistics from the Faculty of Economics, University of Belgrade, in 1983. Kovačević taught at both the Faculty of Economics and the Faculty of Mathematics in Belgrade, where he continued to serve as a scientific adviser. He was a member of the International Statistical Institute. In the last decade, most of his work focused on macroeconomic analysis, and he was a member of several editorial boards of major publications dealing with current economic trends and economic policy analysis ("Macroeconomic Analyses and Trends" issued by the Serbian Chamber of Commerce, "Trends" issued by the Statistical Office of the Republic of Serbia, and "Panoeconomicus" issued by the Association of Economists of Vojvodina). Recently, Miladin Kovačević was a leading expert in the reform of the national accounts, the statistical system, and the integration of the macroeconomic framework. Since 2016, he devoted himself primarily to the creation and maintenance of the so-called Decision Making Support System, as a prerequisite for economic policies in various fields.

Milena B. Stevović

is an independent statistician and data analyst at the Statistical Office of the Republic of Serbia. From January 2020 until July 2023, she served as a teaching assistant for BSc and MSc-level courses in Agricultural Economics and Policy, Agricultural Extension Service, and Co-operative Economics at the Faculty of Agriculture, University of Belgrade. She has also been involved in scientific research in the fields of agricultural economics, agricultural policy and rural development, rural economy, market research and food supply chain analysis, global agriculture, and food security. Currently, she is involved in the development of the system of macroeconomic projections and policy impact analyses at the Statistical Office of the Republic of Serbia. During her professional career, she has participated in international projects in the field of official statistics, as well as in the field of rural development and agricultural policy.

ORIGINAL SCIENTIFIC PAPER
UDK: 339.727.22
330.34(497.11)
DOI: 10.5937/EKOPRE2404169N
Date of Receipt: February 17, 2024

Milan Nedeljković
Metropolitan University
FEFA Faculty
Belgrade

Ivana Todorović
Metropolitan University
FEFA Faculty
Belgrade

SECTORAL FDI AND DESTINATION COUNTRY FUNDAMENTALS: IMPLICATIONS FOR SERBIA

Sektorske strane direktne investicije i fundamenti zemlje primaoca – iskustva za Srbiju

Abstract

This paper implements a new empirical framework for identifying the key host country drivers of FDI flows and studies the performance of Serbia with respect to the identified indicators at the disaggregated sector level. We propose a new method for estimating country scores based on the estimated model parameters. We apply the methods to Serbian data and identify the main potential constraints for stronger production and R&D-type FDI inflows in higher value-added sectors. While we observe some heterogeneity in the performance across different sectors, the results also point to several priorities on the policy agenda.

Keywords: *FDI, nonlinear panel, accumulated local effects, sector analysis, structural policies*

Sažetak

Ovaj rad koristi novu empirijsku metodologiju za identifikaciju ključnih fundamenata zemlje primaoca koji utiču na priliv stranih direktnih investicija (SDI) na sektorskom nivou i analizira trenutnu poziciju Srbije u odnosu na identifikovane indikatore. U radu je predložen novi metod za procenu pozicije zemlje za svaki od pojedinačnih fundamenata pomoću ocenjenih modelskih parametara. Metodologija je primenjena na poslednjim raspoloživim podacima za Srbiju u cilju procene oblasti koje predstavljaju potencijalna ograničenja za veći priliv proizvodnih SDI i SDI u oblasti istraživanja i razvoja u sektorima koji generišu veću dodatu vrednost u privredi. Dobijeni rezultati pokazuju određen nivo različitosti u performansama između sektora i ukazuju na potencijalne prioritete u daljim reformama.

Ključne reči: *SDI, nelinearni paneli, akumulirani lokalni efekti, sektorska analiza, strukturalne politike*

Introduction

Global foreign direct investment (FDI) flows have increased strongly over the last three decades. Although the history of FDI research dates back to the1960s, there has been a considerable rise in academic interest since the 2000s indicating that globalization has increased not only in momentum but also in its characteristics during the last two decades [27]. Despite the moderate global contraction of FDI flows in relation to the COVID-19 crisis, FDI remains a significant source of financing investment needs at the current stage of economic development in Serbia, whilst also contributing to higher economic growth through a variety of channels discussed in the literature (see, e.g., Balasubramanyam et al. [5], Popovici [28], Ramondo et al. [29], Saurav & Kuo [32]). FDIs also played an important role in maintaining the sustainable external position of Serbia and helped ease the depreciation pressures, especially in times of increased uncertainty during the pandemic and recent episodes of increased inflation pressures. Enhancing FDI flows remains one of the key priorities on the policy agenda in Serbia and other emerging and developing economies. Identifying the key host country drivers of FDI flows and implementing policies to address detected constraints for FDI are the main elements of the pro-active policy approach.

The set of potential drivers or constraints discussed both in the economic literature and in policy and business practice is overwhelmingly large (see, e.g., Blonigen & Piger [8], Eicher et al. [13], Saurav & Kuo [32]), from traditional sources of a country's comparative advantage, such as endowments (production factors in the Heckscher-Ohlin framework), extended to institutional quality, to the more recent focus of the literature on the policy-amenable drivers of business and investment climate. The latter on its own includes a large number of potential barriers: i) undeveloped infrastructure (energy, telecommunications, transport, and logistics) and business enabling services (financial sector), which can hinder production capacity and/or increase trade costs; ii) inefficient government policies, which lead to various types of distortions in the economy (product and factor market conditions, property rights protection, general rule of law, ease of firm entry and exit, the presence of tariff and non-tariff barriers, distortive tax regimes); iii) policies that affect overall macroeconomic and political stability; iv) policies targeting specific types of investment or trade promotions.

While the cross-country determinants of FDI flows have been extensively studied in the literature with a focus on a particular narrow set of drivers, only a handful of studies (e.g., Blonigen & Piger [8]; Eicher et al., [13]) examined a broad set of potential determinants arising from economic theory, yet without providing inference on the estimated parameters of the empirical model. The ability to understand which variables, among a large number of indicators, are the statistically significant forces of the effects that we observe in reality is of the utmost importance for efficient decision-making at both the firm and economic policy levels. In this paper, we build upon the recent methodology proposed by Maur et al. [24], who introduced a new method for statistical inference in empirical models for FDI with a large number of explanatory variables. Maur et al. [24] considered more than 190 potential indicators of the host country characteristics in the worldwide sample along all policy-relevant dimensions and identified a subset of statistically significant drivers of FDI flows. We extend their results and study the performance of Serbia with respect to the identified indicators at the disaggregated sector level.

We find mixed results in studying the current state of indicators for attracting production and research and development (R&D) types of FDI in 20 broad sectors in Serbia. We also observe, to a certain extent, a heterogeneity in the performance across different sectors. Serbia performs well in trade openness indicators (tariffs and non-tariff measures), labor force educational level, and the general government net lending dimensions, on average across the different sectors. It displays moderate performance with respect to different indicators of macroeconomic stability, corporate tax regime, and domestic trade policies. Labor force size, political stability, the soundness of the domestic financial system, and the existing logistics infrastructure are areas that, on average, represent a constraint for stronger FDI flows across different sectors. Institutional quality, urban depopulation, and domestic scientific and technical capacity are identified

as the areas that present the largest constraints for FDI in multiple sectors.

The results contribute to the literature in two principal ways. First, we extend the existing empirical work to the case of Serbia, along with proposing an alternative method for the construction of country scores based on the estimated model parameters. Second, our results contribute to the policy discussion and prioritization of measures to alleviate constraints for stronger FDI inflows in Serbia. We focused our analysis on production and R&D types of FDI flows in higher value-added sectors given their stronger expected effect on the domestic economy, especially considering the recent, post-pandemic, shift towards the nearshoring of such types of FDI. The results can be easily applied to all other types of FDI activities or other sectors.

The remainder of the paper is structured as follows: The next section outlines relevant literature. The following section sets the conceptual framework, including a short discussion of the empirical approach of Maur et al. [24]. The subsequent section presents the data. The results and their discussion are provided before the concluding section.

Literature review

The literature studying the motives for locating production abroad distinguishes between two principal types of FDI: horizontal and vertical. Horizontal FDI theory assumes that a firm may want to locate production in the destination market to save on costs of supplying the market, such as tariffs or transport costs; this type of FDI assumes building duplicate plants in a foreign location in order to supply the host country market. Horizontal FDIs are therefore primarily motivated by the size of the destination market and potential impediments to trade. In contrast to horizontal FDI, the literature has emphasized comparative advantage across countries as a motive for the foreign location of some stages of production; this mode is known as vertical FDI. In this case, intra-firm trade between parents and affiliates producing vertically linked goods is a complement of FDI. In essence, vertical FDI leverages low factor prices in host countries to reduce production costs [29]. Vertical FDIs are primarily oriented towards export and tend to be unaffected by the size of the local market [23].

The other stream of literature, the growth theory, is focused on the role of FDI in the economic growth of the host country [5], indicating that improvements in technology, efficiency, and productivity spillovers coming from FDI should contribute to growth in the host country. FDI plays a significant role in transferring advanced technology, knowhow, management practices, and expertise from developed to developing countries, enhancing productivity, stimulating innovation, and upgrading local industries in the recipient country [1]. Moreover, FDI inflows contribute to capital formation, infrastructure development, and job creation, thereby bolstering domestic investment, consumption, and economic activity [23]. In addition, FDI inflows are associated with improvements in the labor market [3], the deepening of trade linkages [32] and fostering competitive pressures and market efficiencies, prompting domestic firms to improve their performance and adopt more efficient production methods. Conversely, the literature also identifies several potential negative effects of FDI on economic growth [7]: FDI may exacerbate income inequality and distort resource allocation by favoring capital-intensive sectors and large multinational corporations over small and medium-sized enterprises (SMEs) and local businesses. Furthermore, FDI can intensify the "resource curse" phenomenon, whereby countries rich in natural resources attract FDI that fails to translate into sustainable economic development due to governance challenges, corruption, and Dutch disease effects. Additionally, FDI may crowd out domestic investment or hinder the development of indigenous technological capabilities, especially in cases where foreign affiliates operate in a siloed environment, isolated from the local economy. Overall, the mixed empirical evidence on the association of FDI for economic growth (see, e.g., survey in [23]), also underscores the importance of effective policy frameworks, institutional reforms, and regulatory safeguards to mitigate potential risks and maximize FDI's positive contributions to sustainable development [25].

Motivated by alternative FDI theories, there arises a vast empirical literature investigating the drivers of FDI indicating size [36] and growth potential of the host

country [37], economic and political stability [33], [35], the market openness [34], tax policies [35], as well as quality of institutions [9] as main potential drivers of FDI. However, the literature has not yet reached the consensus on the key determinants of FDI, and the estimated coefficients on different destination country fundamentals tend to be ambiguous and sometimes contradictory [13], [22], [23], [26]. Using systematic literature review methodology, Islam & Beloucif [17] for example showed that the size of the host market is the most robust determinant, followed by trade openness, infrastructure quality, labor cost, macroeconomic stability, human capital, and the growth prospect of the host country. Market size is highly significant in all studies in their review, indicating that most of the world's FDI are market-seeking. Conversely, Balasubramanyam et al. [5] and Sekkat & Venganzones-Varoudakis [34] find trade openness to be the main driver of FDI. The subset of important determinants of FDI may also vary depending on the level of development of the economy. For example, Popovici et al. [28] find trade openness as the main determinant of FDI, while the rest of the determinants may vary for the high-income (their prospects for growth and infrastructure development), middle-income (quality of institutions and stability of the macroeconomic environment), and low-income economies (highly educated labor force). Dollar et al. [11] use surveys from 8 countries to assess the impact of policies affecting investment climates on firm international trade integration. Blonigen & Piger [8] use Bayesian Model Averaging of 56 potential covariates with FDIs, which include measures related to GDP, labor endowments, capital, land and natural resources endowments, trade openness, FDI and investment climate, tax policy, communication infrastructure, financial infrastructure, policy environment, as well as dyadic variables commonly included in gravity models: distance, cultural proximity, and geographic proximity measures. The results find a narrower set of variables (between 7 and 16) with a high inclusion probability as a predictor of FDI, thus suggesting that a parsimonious model could explain FDI outcomes. They find little support for policy variables controlled by the host country (such as multilateral trade costs, business costs, infrastructure, or political institutions) that influence FDI, with an exception for bilateral trade and investment policies. Bergstrand & Egger [6], Head & Ries [16], and Dorakh [12] use gravity models for testing potential determinants of FDI.

Increasing availability of firm level data has motivated more recent research on the firm-level determinants of FDI. Key firm-specific dimensions include research and development (R&D) potential and investment, human capital, differences in input costs, market costs and financial policies. However, similar to macro-level research, the literature has not yet reached consensus on the subset of key determinants. Sarker & Serieux [31] found that FDI depends on both firm- and country-level factors in the host countries, the set of firm level data is narrowed to communication, finance, and corporate governance quality, while Lee [21] distinguished innovation capabilities measured by R&D intensity and marketing capabilities measured by selling, general, and administrative intensity.

The recognized potential positive growth effects of FDI has motivated growing literature on the analysis of specific determinants of FDIs in the region of Western Balkans and Serbia [30]. The importance of government in stimulating the inflow of FDI is recognized by Arandjelovic & Petrovic-Randjelovic [4] and Jirasavetakul & Rahman [18], while the positive impact of tax incentives on the choice of a country as an investment destination is shown in Domazet et al. [10]. Analyses of FDI determinants in Visegrad Group and Serbia [20] indicate that external factors such as the overall business environment, economic crisis, political risks, positions in relevant institutions, and shocks such as pandemics determine the overall volume of FDI as well. Kastratovic & Loncar [19] analyze the effectiveness of bilateral investment treaties in promoting FDI outflows using a gravity model based on panel data for Serbia and 147 partner economies. The results show that bilateral investment treaties as well as unilateral liberalization of the FDI regime in the host country are positively affecting outflows of foreign direct investment from Serbia.

In this paper, we contribute to the literature by analyzing the position of Serbia based on the subsample of statistically significant indicators of FDI, which is chosen among more than 190 potential indicators of the host country's characteristics, relying on and extending the methodology proposed in Maur et al. [24].

Conceptual framework

The decision to undertake foreign direct investment, therefore, is a result of the complex analysis of the company's internal and external environment. The external environment includes both push (global/source country level) and pull (host country level) fundamentals. The empirical literature that studies country-level drivers of FDI flows surveyed above typically focuses on one or a small subset of potential FDI drivers and tests whether the estimated empirical relations corroborate with theoretical models. From the host country's policymaker's perspective, such approaches are relevant for the goal of testing how concrete policy measures are expected to impact future FDI inflows. However, empirical approaches that include a subset of potential FDI drivers are of limited policy use if the goal of the policymaker is to identify all areas in the domestic economy that may constitute a constraint for FDI inflows.

An alternative, quick-win policy approach has been different benchmarking indicators, such as the Global Competitiveness Indicator (GCI) series prepared annually by the World Economic Forum, the Distance to Frontier (DtF) approach of the now-infamous Doing Business indicators, or global or regional enterprise and investment climate surveys. The benchmarking indicators offer a readily available and comprehensive set of data that maps the country's performance in a particular indicator dimension vis-à-vis its global peers. However, the indicators do not enable formal assessment of whether they are actually important for FDI flows in a given sector, which value of the indicator constitutes the alarm for policymakers, and how the indicators interact with each other, limiting their usage for policymaking.

Maur et al. [24] proposed a new empirical approach targeted at addressing the shortcomings of both strands of literature. The approach starts with a large set of potential host country indicators of FDI inflows and, using recent advancements in econometric and machine learning literature, provides a new inference procedure for high-dimensional nonlinear panel data models typically employed in the analysis of FDI inflows. In this way, a manageable subset of statistically significant indicators can be obtained without restricting the set of potential indicators a priori.

In particular, nonlinear panel data models with individual effects ($i = 1, 2,..., j = 1, 2,..., N$) have the following representation:

$$Y_{i,j} = g\{\alpha_i + \gamma_j + \Sigma_{p=1}^{K} \beta_p W_{i,j}^{p} \geq \varepsilon_{i,j}\}, \varepsilon_{i,j} \mid W_{i,j}, \alpha, \gamma \sim F_{\varepsilon} \quad (1)$$

where function $g()$ is typically the indicator function, and error distribution is typically a logistic cumulative distribution function (CDF) or a standard normal CDF (in which cases the dependent variable $Y_{i,j}$ is binary). Other choices are also possible. Parameters α_i and γ_j are individual effects, and we are interested in estimating and conducting inference on the parameters β_p for a potentially large number K of explanatory variables $W_{i,j}^{p}$. The proposed algorithm estimates the unknown parameters and provides a method for inference on the estimated coefficients, building upon recent work on estimation and inference in nonlinear panel data models [15] and inference in high dimensional models [14]. The algorithm is as follows:

1) Split randomly the data (with no replacement) with respect one panel dimensions (say, N_1 and N_2) while maintaining the panel structure along the second dimension.
2) Use XGB algorithm (or alternative machine learning algorithms) to find the subset W^Q of the Q best predictors of $Y_{i,j}$ in the first subsample (keeping the fixed effects among the predictors).
3) Run separate nonlinear panel regression models for each explanatory variable on the second subsample using W^Q from step 2 as the additional regressors in these estimations.
4) Use analytic bias correction proposed in Fernandez-Val and Weidner [15] on the coefficient estimates from step 3.
5) Repeat the steps 1-4 M times.
6) Take the empirical mean from M random splits to get the final estimate $\widehat{\beta_p}$.

$$\widehat{\beta_p} = \Sigma_{m=1}^{M} \widehat{\beta_{p,m}} \quad (2)$$

7) Obtain the standard errors and the confidence intervals using nonparametric delta method (Efron, 2014) from the empirical distribution of $\widehat{\beta_{p,m}}$.

The algorithm efficiently controls for three types of bias which may be present in the estimated parameters, for more discussion please refer to the paper.

Applying the algorithm to 190 potential destination country drivers of FDI flows for 116 countries and 245 sectors over the 2010-19 period, Maur et al. [24] identified a subset of statistically significant drivers of global FDI flows. The drivers included destination country characteristics in all dimensions that foreign investors could potentially explore in their analysis. The indicators include variables that are policy-amenable over the short or medium run, as well as country fundamentals such as GDP growth or population size. The latter indicators may not be under the direct influence of policymakers in the short run; however, they sublime the effects of multiple policy initiatives and are also relevant preconditions for maximizing the effect of more focused policy initiatives. The empirical model displays strong forecasting performance, reaching an area under the ROC curve value of 0.92 in prediction of future FDI inflows over the five-year span.

In this paper, we extend the estimated model to Serbian data. Based on the estimated parameters and available data, our goal is to understand how Serbia performs along each statistically significant indicator of the country's attractiveness for FDI. Hence, we want to define a traffic light system that will map the actual value of the indicator for Serbia over the most recent period to the score on the scale between one and five, taking into account the estimated parameters from the global model sample and all interdependencies between the variables. In this way, we can obtain a transparent and easy-to-use identification of areas where Serbia performs well (score values of the indicator equal to four or five), where it has moderate performance (the score equals three), and where the constraint for stronger FDI inflows is present (the score equals one or two).

For calculating the scores at the sector level, we need to define four sector-specific boundary values for each statistically significant variable. These boundary values should be defined in the way that projects the space of all possible values the variable can take into five regions, which are: i) similar enough within the region and ii) dissimilar enough between the regions with respect to the estimated probability of receiving FDI in the sector. In addition, we need that the measure of probability is monotonically increasing going from the first to the last region and that it is a function of all model parameters.

To satisfy the required conditions, we combine a measure of nonparametric accumulated local effects (ALE) introduced by Apley and Zhu [2] with the K-means clustering algorithm to arrive at estimates of sector-specific boundary values for each variable. Using simulation methods, ALE produces a monotonically increasing estimate of the model probability of receiving FDI for any potential value ("local value") of the variable of interest, integrating out the effects of other variables on probability. Once we have the estimated ALE for all potential values of variables, we apply the K-means clustering approach to obtain the boundaries of the relevant regions. The algorithm is the following:

1) Load estimated model parameters.
2) Load data for all countries, and for each variable, calculate the worldwide minimum and maximum.
3) For each variable and sector, estimate ALE using 1,000 simulations on the range of values defined in step 2.
4) Apply K-means clustering on ALE realizations to get the boundary values for regions.
5) Repeat steps 3-4 for each variable and sector.

The result of the algorithm is the set of boundary values for each variable and sector pair, which we use later to obtain the scores for Serbia.

Table 1 provides an example of the estimated boundary values for one selected variable (GDP growth: five-year ahead average forecast) and for production and R&D types of FDI inflows in three sectors each. Depending on the estimated model parameters and sector characteristics, the boundary points may differ, as we see in the table. The boundary points are used to assign scores. For example, a country with a 5-year GDP growth forecast of 3.5% will receive a score of 3 for FDI flows in auto components (the actual value is higher than the second boundary point but lower than the third), but a score of 2 for FDI flows into biotech R&D. The heterogeneity in the boundary point values reflects the estimated differences in importance of

each variable for FDI inflows in a particular sector in the global sample.

Data

The data for country-level indicators over the 2018-2023 period primarily comes from the World Bank's TCdata360. The unique source of the data is used for data consistency purposes. Data for several macroeconomic indicators that were incomplete in the TCdata360 database is obtained from the IMF's World Economic Outlook (WEO) database. In line with the econometric approach used in Maur et al. [24] the raw annual indicator data is transformed into five-year averages over the most recent available period to mitigate the effects of cyclical fluctuations and pandemic-related potential outliers, thereby focusing on more structural changes in the indicators.

Our definition of sectors for FDI inflows is close to definition of sectors used by the Financial Times. We look at 35 granular sectors and also distinguish between potential types of FDI activities (production, research and development, customer service, retail, logistics, and others).. We focus our analysis on a subset of high-value-added sectors and on production and R&D types of FDI activities, given their relevance for achieving sustainable high economic growth rates through positive productivity spillovers, technology transfers, and deepening of trade linkages [32]. The results for other sectors and types of FDI activities are available from the authors.

Results and discussion

This section presents the estimated scores for each sector, FDI activity, and destination country indicator. Please recall that scores equal to one or two indicate that Serbia is performing relatively poorly in this dimension, constituting a potential constraint for higher FDI inflows. A score equal to three indicates moderate performance with some potential for improvement, while scores equal to four or five imply good performance with a small margin for further improvement. To ease interpretation, the scores are also reported in different colors. We first present the results for production-oriented FDIs and later for R&D FDI types.

We consider the indicators which are identified as statistically significant drivers of global FDI flows in Maur et al. [24]. The indicators, presented in Table 2, are grouped into nine types, reflecting their underlying characteristics and potential effects or motives for foreign investors: domestic demand size, production factor capacity, production support, taxes and regulatory barriers, rule of law, foreign trade contestability, home market contestability, macroeconomic and political stability, and past FDI performance. Higher values of some indicators may increase the likelihood of FDI inflows (such as, for example, domestic demand size for FDIs aimed at primarily serving the domestic market or production factor capacity variables for any types of FDI).

On the other hand, higher values of some indicators indicate potentially higher costs and/or uncertainty for investment and will have a negative effect on the FDI probability (for example, cost to import or export, tax rates, inflation). To avoid ambiguity, all values of the indicators are scaled in such a way that the higher assigned scores indicate more favorable conditions for investment.

Figures 1-2 present the results for production-type FDIs. Although for most indicators we observe some heterogeneity in the estimated scores across the sector,

Table 1: Example of estimated boundary points for selected sectors and one variable

Variable: GDP growth 5Y forecast (percentage)	FDI inflows					
	Production type			R&D type		
Boundary point	Auto components	Auto OEM (manufacturers)	Consumer products	Biotech	Communications	Industrial equipment
One	2.023	2.600	1.916	3.163	2.600	1.440
Two	3.371	4.159	4.000	4.000	3.706	2.600
Third	4.260	5.544	5.059	5.131	4.711	3.706
Four	6.303	6.940	6.669	6.452	6.117	5.317

Source: Authors' calculations

Note: The table reports estimated boundary points (rows) for sectors defined in columns for two types of FDI inflows and selected variable.

the results, on average, provide some guidance on areas which require policy attention.

The achieved trade openness does not represent a constraint for FDI inflows across the sectors, as the score for foreign trade contestability and past FDIs is generally above 4 (or even 5) for all indicators in this group, with some exceptions in the case of tariff rates, for which the estimated score is 3. Serbia also scores relatively strongly on taxes and regulatory barriers related to registering property, with an average score close to 4. The labor tax and contributions are areas within this dimension which could benefit from some improvements to further increase the attractiveness of FDI in the majority of sectors, as the obtained score is largely equal to 3.

We observe some heterogeneity in the scores for macroeconomic and political stability indicators. While

Table 2: The list of statistically significant destination country indicators

Type	Indicators
Domestic demand size	GDP growth (5Y forecast, %); Final consumption expenditure (% of GDP)
Production factors capacity	Labor force size (total); Tertiary education enrollment (gross %); Urban population (% growth); Industry value added (% growth); Scientific and technical journal articles (total)
Production support	Logistics performance index (1-5); Soundness of banks index (1-7)
Taxes and regulatory barriers	Labor tax and contributions (% of profit); Profit tax (% of commercial profits); Total tax & contribution rate (% of commercial profits); Time to pay taxes (hrs/year); Cost of registering property (% of property values)
Institutions: rule of law	Judicial independence index (1-7); Commencement of proceedings to resolve insolvency index (0-3)
Institutions: foreign trade contestability	Cost to Import: Documentary Compliance (USD); Cost to Export: Border Compliance (USD); Cost to Export: Documentary Compliance (USD); Tariff rate, most favored nation (simple mean all products, %)
Institutions: home market contestability	Prevalence of trade barriers (1-7); General government final consumption expenditure (% of GDP)
Macroeconomic and political stability	Inflation, consumer prices (annual %); General government gross debt (% of GDP); General government net lending/borrowing (% of GDP); Political Stability No Violence index (-3 to 3)
Past FDI	Foreign Direct Investment: Inward stock (USD per capita)

Source: Authors' calculations based on [25]

Figure 1: Estimated scores for production type FDIs (first part)

	Sectors									
Indicator	Auto components	Auto manufacturers	Beverages	Biotech	Building materials	Business equipment	Chemicals	Communications	Consumer electronics	Consumer products
GDP growth: 5Y forecast	3	2	3	4	2	4	2	4	3	3
Final consumption expenditure	3	3	3	4	3	4	3	4	4	3
Labor force, total	3	3	2	1	2	2	3	2	3	3
Tertiary education enrollment	4	4	4	4	4	4	5	4	3	4
Labor tax and contributions	3	3	3	3	3	3	3	3	4	3
Urban population growth	1	1	1	1	1	1	1	1	1	1
Industry, value added growth	3	3	3	3	3	3	3	3	3	3
Scientific and technical journal articles	2	2	2	3	2	2	3	2	3	3
Logistics performance index	3	3	2	2	3	2	3	2	3	3
Soundness of banks	2	3	3	2	2	2	3	3	3	2
Profit tax	4	3	3	4	3	4	4	3	3	3
Total tax and contribution rate	3	3	4	4	3	3	3	4	4	3
Time to pay taxes	3	3	4	3	4	3	4	3	4	4
Registering property: Cost	4	4	4	3	4	4	4	4	4	4
Commencement of proceedings to resolve insolvency	3	3	2	3	2	1	2	3	4	3
Judicial independence	2	2	2	2	2	2	2	2	2	2
Cost to Import: Documentary Compliance	5	5	5	5	5	5	5	5	5	5
Cost to Export: Border Compliance	5	5	5	5	5	5	5	5	5	5
Cost to Export: Documentary Compliance	5	5	5	5	5	5	5	5	5	5
Prevalence of trade barriers	3	3	4	2	3	2	3	2	2	3
Tariff rate, most favored nation	4	3	4	3	4	4	3	4	4	4
General gov. final consumption expenditure	3	4	3	2	3	3	3	3	3	3
Inflation, consumer prices	4	3	3	4	3	3	4	3	3	3
General government net lending/borrowing	4	4	4	4	4	5	4	4	4	4
General government gross debt	2	3	2	3	2	3	2	3	3	2
Political Stability: No Violence	3	3	3	2	3	2	3	2	2	3
Foreign Direct Investment: Inward stock	4	4	4	4	4	4	4	4	4	4

Source: Authors' calculations

the achieved fiscal prudence has positive effects on FDI inflows with a high score across the sectors, general government gross debt (as a percentage of GDP), despite recent contractions, is still at levels suggesting a potential small constraint for future production FDI flows, which should be monitored further. The estimated scores for the home country's political environment indicator also imply some room for improvement.

Analogously, production factors and capacity indicators display different behaviors. Serbia scores highly along tertiary education enrollment and relatively moderately with respect to domestic industry value-added growth, indicating a certain capacity to attract high-value-added FDIs. On the other hand, it scores below average with respect to the measure of scientific advancements (scientific and technical journal articles), which received a score of two for multiple sectors. The current size of the labor force presents a potential moderate constraint for FDI flows, receiving an average score between two and three, yet future labor dynamics, approximated by urban population growth, indicate a potential significant constraint for FDI, receiving the lowest score consistently across the sectors.

Serbia scores moderately with respect to the production support dimension, with the logistics quality and the soundness of the domestic financial system receiving mixed scores between two and three. The latter may be of less importance in the case of large FDIs, as foreign companies, given their significant exposure to the international financial system, are in a position to internalize the presence of these types of constraints. Conversely, despite some progress in insolvency regulation and de facto procedures, the institutional quality of the rule of law still represents a constraint for FDI inflows, receiving a score equal to two for the judicial independence index proxy. Domestic demand size, on average, does not represent a significant constraint for this type of FDI inflow, which is primarily export oriented.

Figures 3-4 present the results for R&D-type FDIs. The results are broadly qualitatively similar to the results for production-type FDIs. The indicators related to export and import costs, fiscal stability, and tertiary education enrollment still receive high scores, with slightly higher variation across the sectors. The labor force dynamics and the rule of law indicators remain the most important identified constraints for FDI inflows. In addition, the scores

Figure 2: Estimated scores for production type FDIs (second part)

	Sectors									
Indicator	Electronic compo-nents	Engines & turbines	Industrial equipm	Medical devices	Pharma-ceuticals	Plastics	Renewable energy	Rubber	Semi-conductors	Wood products
GDP growth: 5Y forecast	2	4	2	3	2	3	4	3	4	4
Final consumption expenditure	3	5	3	4	3	3	4	4	5	4
Labor force, total	3	2	3	2	3	2	3	2	2	2
Tertiary education enrollment	4	4	4	4	4	4	4	4	3	4
Labor tax and contributions	3	3	3	3	3	3	4	3	4	3
Urban population growth	1	2	1	1	1	1	2	1	1	2
Industry, value added growth	3	3	3	3	3	3	3	3	3	3
Scientific and technical journal articles	3	4	3	2	3	2	2	3	2	2
Logistics performance index	3	2	2	2	3	2	2	3	2	2
Soundness of banks	3	3	2	2	2	2	2	3	2	3
Profit tax	4	4	3	3	4	4	4	3	4	3
Total tax and contribution rate	3	4	3	4	3	4	4	4	4	3
Time to pay taxes	4	3	3	3	3	4	3	4	3	4
Registering property: Cost	4	4	4	4	4	5	4	4	4	4
Commencement of proceedings to resolve insolvency	3	4	2	3	3	3	3	2	4	3
Judicial independence	2	2	2	2	2	3	2	2	2	2
Cost to Import: Documentary Compliance	5	5	5	5	5	5	5	5	5	5
Cost to Export: Border Compliance	5	4	5	5	5	5	5	5	5	5
Cost to Export: Documentary Compliance	5	5	4	5	5	5	5	5	5	5
Prevalence of trade barriers	3	3	3	3	3	3	2	2	2	3
Tariff rate, most favored nation	4	3	4	4	4	4	4	4	4	4
General gov. final consumption expenditure	4	3	3	3	3	3	3	3	4	2
Inflation, consumer prices	3	2	4	4	4	4	3	4	3	3
General government net lending/borrowing	4	3	4	4	4	4	5	4	4	4
General government gross debt	2	3	2	3	2	2	3	2	3	3
Political Stability: No Violence	3	2	4	3	4	3	3	3	2	3
Foreign Direct Investment: Inward stock	4	4	4	4	4	4	4	4	4	4

Source: Authors' calculations

for the logistics performance index decreased, implying stronger constraints in multiple sectors.

The presented results convey several important policy implications. First, the obtained estimates suggest that FDI investors may give different importance to particular dimensions of the host economy depending on the sector in which they invest and the type of FDI. Therefore, while improving general investment and institutional climate is expected to be beneficial for the entire economy, the sequencing of the reforms may have disproportional effects on individual sectors, depending also on their importance for the economy. Second, and in line with the recent reform focus, trade openness, macroeconomic fundamentals, and regulatory barriers related to property registration contribute positively to FDI dynamics across the sectors. Third, the labor force dynamics already constitute a potential barrier to higher FDI inflows, with even stronger negative effects expected in the future. The weak performance in the scientific work points to an additional dimension of the constraint. The policymakers can address these constraints through a combination of policies yielding short-term wins and long-term sustainable progress, including a more open immigration regime for highly skilled workers to address skills shortages, additional reforms to support scientific and technical research through different incentive schemes for researchers, and further support for partnership programs between the companies (both domestic and foreign) and research institutions. Moreover, relatively low scores for logistics performance indicate a potentially negative effect of high logistics costs on FDI. Such developments call for short-term initiatives which policymakers can consider to overcome shortcomings in this area, such as spatial solutions to reduce transport costs and disadvantages related to remote locations. Fourth, institutional quality, especially with respect to the rule of law, remains one of the largest constraints for FDI flows. The improvements and changes in the de jure and de facto institutional strength, in addition to strengthening the domestic economy, are also expected to have strong positive effects on future FDI flows.

Conclusions

The role of FDI as an important factor contributing to the economic growth, employment, and sustainable external position of developing economies has been largely recognized by the literature. Over the past several decades, emerging and developing economies have been making increasing efforts to position themselves as attractive host

Figure 3: Estimated scores for R&D type FDIs (first part)

	Sectors								
Indicator	Auto components	Auto manu-facturers	Biotech	Business equipment	Business services	Chemicals	Commu-nications	Consumer electronics	Consumer products
GDP growth: 5Y forecast	3	3	3	4	3	3	3	3	3
Final consumption expenditure	5	4	5	5	4	4	3	4	4
Labor force, total	2	3	2	3	3	2	3	2	3
Tertiary education enrollment	3	4	4	4	5	4	4	4	4
Labor tax and contributions	3	3	3	3	3	3	3	3	4
Urban population growth	1	1	1	1	1	1	2	1	1
Industry, value added growth	3	3	3	3	3	3	3	3	3
Scientific and technical journal articles	4	3	2	3	2	3	2	4	3
Logistics performance index	2	2	2	1	3	2	2	2	2
Soundness of banks	3	3	2	2	2	3	2	2	3
Profit tax	3	3	2	4	3	3	3	4	2
Total tax and contribution rate	4	4	3	4	3	4	4	4	5
Time to pay taxes	3	3	3	3	3	4	3	3	3
Registering property: Cost	3	3	5	5	4	5	5	3	5
Commencement of proceedings to resolve insolvency	3	3	4	4	3	3	3	3	3
Judicial independence	2	2	2	2	2	2	3	2	2
Cost to Import: Documentary Compliance	4	4	5	5	5	5	5	5	5
Cost to Export: Border Compliance	5	5	5	5	5	5	5	5	5
Cost to Export: Documentary Compliance	5	5	5	5	5	5	4	5	5
Prevalence of trade barriers	2	3	2	2	3	2	2	3	2
Tariff rate, most favored nation	4	3	4	4	4	4	4	3	4
General gov. final consumption expenditure	3	2	4	4	3	2	3	3	3
Inflation, consumer prices	3	3	3	3	4	3	3	2	2
General government net lending/borrowing	4	4	4	4	4	4	4	5	5
General government gross debt	2	3	3	3	2	3	3	3	3
Political Stability: No Violence	2	3	2	3	3	2	3	2	2
Foreign Direct Investment: Inward stock	4	4	4	4	4	4	4	4	4

Source: Authors' calculations

countries for foreign investments. The countries used a variety of different policies, including different types of subsidy schemes, to attract foreign investors. The state of destination country fundamentals, however, remains the key determinant of average FDI inflows and should represent the focus for policymakers considering policies to maximize the positive effects of FDI flows.

The increasing availability of large volumes of economic, financial, and various other types of data (the "big data" paradigm) has allowed policymakers to advance their understanding of many relevant questions. However, the proliferation of data made the interpretation of the uncovered economic relations more complicated. The "black box" character of modern artificial intelligence (AI) and machine learning (ML) models, while particularly suitable for improving the predictions of economic relations of interest, has posed a significant obstacle to utilizing these models in effective economic policy.

In this paper, we implemented a new empirical framework for identifying the key host country drivers of FDI flows and studied the performance of Serbia with respect to the identified indicators at the disaggregated sector level. The framework bridges the gap between the typical focus on one or several policy dimensions in the empirical FDI literature and the lack of statistical rigor in the big data policy benchmarking literature, enabling the identification and analysis of multiple policy-relevant dimensions.

We focused our analysis on the production and R&D types of FDI inflows in twenty high-value-added sectors in Serbia. Building upon the estimates from the global sample of countries and sectors, we outlined a method for identifying whether individual policy dimensions constitute a potential constraint for FDI inflows in a given sector.

The results reveal a certain level of heterogeneity in the current performance of specific policy dimensions across the sectors. Aggregating the results, we obtained that trade openness, labor force educational level, and fiscal policy are policy dimensions in which Serbia performs well and does not represent a constraint for FDI inflows in the majority of considered sectors. Moreover, the results imply that Serbia displays moderate performance with respect to different indicators of macroeconomic stability, corporate tax regime, and domestic trade policies, with some room for potential improvements. Current labor force size, political stability, and the existing logistics infrastructure are areas that tend to present constraints for stronger FDI flows in multiple sectors. Institutional quality, depopulation trends, and domestic scientific and technical capacity are identified as the areas that present

Figure 4: Estimated scores for R&D type FDIs (second part)

	Sectors								
Indicator	Electronic components	Engines & turbines	Industrial equipment	Medical devices	Pharmaceutic ls	Plastics	Rubber	Semi-conductors	Software & IT services
GDP growth: 5Y forecast	3	5	4	4	4	4	4	4	3
Final consumption expenditure	5	5	4	5	5	4	5	4	3
Labor force, total	2	3	2	2	4	3	3	2	3
Tertiary education enrollment	4	4	4	5	4	4	4	4	5
Labor tax and contributions	3	3	3	4	3	3	4	3	3
Urban population growth	1	1	1	1	1	1	1	1	1
Industry, value added growth	3	4	3	4	3	3	3	3	3
Scientific and technical journal articles	3	2	3	2	2	2	4	3	3
Logistics performance index	2	1	2	1	2	1	1	1	3
Soundness of banks	3	1	3	2	2	2	3	3	2
Profit tax	3	4	3	2	4	4	2	3	3
Total tax and contribution rate	4	4	4	4	4	4	4	4	3
Time to pay taxes	3	3	3	3	2	4	3	3	4
Registering property: Cost	5	4	4	5	5	5	5	4	4
Commencement of proceedings to resolve insolvency	3	3	3	3	3	3	4	4	3
Judicial independence	2	1	2	2	2	2	2	2	3
Cost to Import: Documentary Compliance	4	5	5	5	5	5	5	5	5
Cost to Export: Border Compliance	5	5	5	5	5	5	5	5	5
Cost to Export: Documentary Compliance	5	5	5	5	5	5	5	5	5
Prevalence of trade barriers	2	2	2	2	2	2	2	2	4
Tariff rate, most favored nation	3	4	4	3	4	4	3	4	4
General gov. final consumption expenditure	3	4	3	4	4	3	2	3	3
Inflation, consumer prices	3	2	3	3	2	2	3	4	4
General government net lending/borrowing	4	4	4	4	4	4	4	4	4
General government gross debt	3	3	2	4	3	3	4	3	2
Political Stability: No Violence	3	3	3	3	2	3	2	2	3
Foreign Direct Investment: Inward stock	4	4	4	4	4	4	4	4	4

Source: Authors' calculations

the largest constraint for FDI in multiple sectors and call for policymakers' attention.

Our results can be extended to multiple areas. We focused our analysis on production and R&D types of FDI flows in high-value-added sectors, given their stronger expected effect on the domestic economy. This is especially important considering the post-pandemic shift towards the nearshoring of such types of FDI, which puts Serbia in a better pole position for attracting higher value-added FDIs. The results can be easily applied to all other types of FDI activities or other sectors, providing a comprehensive assessment of potential constraints for higher FDI inflows. Moreover, the proposed empirical approach can be applied to study other policy-relevant questions of interest: identification of constraints for export performance across sectors, identification of constraints for nearshoring, and many more.

References

1. Aitken, B., Hanson, G., H., & Harrison, A., E. (1997). Spillovers, Foreign Investment and Export Behavior. *Journal of International Economics*, *43*, 103-32.
2. Apley, D. W., & Zhu, J. (2020). Visualizing the effects of predictor variables in black box supervised learning models. *Journal of the Royal Statistical Society Series B: Statistical Methodology*, *82*(4), 1059-1086.
3. Arandarenko, M., Aleksić, D., & Lončar, D. (2021). Expansion of direct investment and resilience of Serbian labour market: A regional and sectoral perspective. *Ekonomika preduzeća*, *69*(3-4), 203-216.
4. Aranđelović. Z., & Petrović-Ranđelović, M. (2011). The Impact of the State on Inflow and Efficiency on Foreign Direct Investment. *Ekonomika preduzeća, 59*(3-4), 143-156.
5. Balasubramanyam, V. N., Salisu, M, & Sapsford, D. (1996). Foreign Direct Investment and Growth in EP and is Countries. *The Economic Journal, 106*(434), 92-105.
6. Bergstrand J., & Egger, P. (2007). A Knowledge and Physical Capital Model of International Trade Flows, Foreign Direct Investment, and Multinational Enterprises. *Journal of International Economics*, 2007, *73*(2), 278-308.
7. Blomström, M., & Kokko, A. (1998). Multinational corporations and spillovers. *Journal of Economic Surveys*, *12*(3), 247-277.
8. Blonigen, B., & Piger, J. (2014). Determinants of Foreign Direct Investment. *Canadian Journal of Economics, 47*(3), 775-812.
9. Dellis, K., Sondermann, D., Vansteenkiste, I. (2017). *Determinants of FDI inflows in advanced economies: Does the quality of economic structures matter* (ECB Working Paper Series, No 2066/May 2017).
10. Domazet, I., Marjanović, D., Stošić, I. (2018). Attractiveness Of The Domicile Economy Through Tax Incentives. *Ekonomika preduzeća*, *66*(7-8), 434-445.
11. Dollar, D., Hallward-Driemeier, M., & Mengistae, T. (2006). Investment climate and international integration. *World Development*, *39*(9), 1498-1516.
12. Dorakh, A. (2020). A Gravity Model Analysis of FDI across EU Member States. *Journal of Economic Integration*, *35*(3), 426-456.
13. Eicher, T.S., Helfman, L, & Lenkoski, A. (2012). Robust FDI Determinants: Bayesian Model Averaging In The Presence Of Selection Bias. *Journal of Macroeconomics*, *34*(3), 637-651.
14. Fei, Z., & Li, Y. (2021). Estimation and Inference for High Dimensional Generalized Linear Models: A Splitting and Smoothing Approach. *Journal of Machine Learning Research*, *22*, 1-32.
15. Fernandez-Val, I., & Weinder, M. (2016). Individual and time effects in nonlinear panel models with large N, T. *Journal of Econometrics*, *192*(1), 291-312.
16. Head, K. & Ries, J. (2008). FDI as an outcome of the market for corporate control: Theory and evidence. *Journal of International Economics*, *74*(1), 2-20.
17. Islam, M. S., Beloucif, A. (2023). Determinants of Foreign Direct Investment: A Systematic Review of the Empirical Studies. *Foreign Trade Review, 59*(2), 1-29.
18. Jirasavetakul, L-B. F., & Rahman. J. (2018). *Foreign Direct Investment in New Member States of the EU and Western Balkans: Taking Stock and Assessing Prospects* (IMF Working Paper, WP/18/187).
19. Kastratovic, R., & Lončar, D. (2023). The Role of Bilateral Investment Treaties in Promoting the Internationalization of Enterprises in Serbia. *Ekonomika preduzeća, 71*(1-2), 47-63.
20. Kemiveš, A., & Barjaktarović, L. (2020). Influence of External Factors on Foreign Direct Investment Flows Using the Example of the Visegrad Group and Serbia. *Ekonomika preduzeća*, *69*(3-4), 80-94.
21. Lee, I. H., & Rugman, A. M. (2012). Firm-Specific Advantages, Inward FDI Origins, and Performance of Multinational Enterprises. *Journal of International Management 18*(2), 132-146.
22. Lensik, R., Morrisey, O. (2006). Foreign Direct Investment: Flows, Volatility, and the Impact on Growth. *Review of International Economics*, *14*(3), 478-493.
23. Lim, E-G. (2001). *Determinants of and the relationship between Foreign Direct Investments and growth: A Summary of Recent Literature* (IMF Working Paper, WP/01/175).
24. Maur, J-C., Nedeljkovic, M., & Uexkull E.V. (2022). *FDI and Trade Outcomes at the Industry Level—A Data-Driven Approach* (World Bank Policy Research Working Papers 9901).
25. Moran, T. H. (2006). *Harnessing foreign direct investment for development: Policies for developed and developing countries*. Peterson Institute.
26. Nguyen, P. C., Nguyen, T. B., Su, D. T., Schinckus, C. (2020). Determinants of foreign direct investment inflows: The role of economic policy uncertainty. *International Economics*, *161*, 159-172.
27. Paul, J., & Feliciano-Cestero, M. (2021). Five decades of research on foreign direct investment by MNEs: An overview and research agenda. *Journal of Business Research, 124*. 800-812.

28. Popovici, O. C., Calin, A. C., & Ivana, D., & Dan, S. (2021). FDI Determinants Revisited: Extensive Evidence. *Romanian Journal of Economic Forecasting*, *XXIV*(4), 103-123.
29. Ramondo, N., Rappoport, V., & Ruhl, K. J. (2016). Intrafirm trade and vertical fragmentation in US multinational corporations. *Journal of International Economics*, *98*, 51-59.
30. Rapaić, S. (2017). The Impact of FDI on the Economic Development of Serbia. *Ekonomika preduzeća*, *65*(5-6), 381-392.
31. Sarker, B., & Serieux, J. (2023). Multilevel determinants of FDI: A regional comparative analysis. *Economic Systems*, *47*(3), 101095.
32. Saurav, A. & Kuo, R. (2020). *The Voice of Foreign Direct Investment. Foreign Investor Policy Preferences and Experiences in Developing Countries* (World Bank Policy Research Working Paper 9425).
33. Schneider, F., & Frey, B. S. (1985). Economic and Political Determinants of Foreign Direct Investment. *World Development*, *13*(2), 161-175.
34. Sekkat, K., & Venganzones-Varoudakis, M-A. (2007). Openness, Investment Climate, and FDI in Developing Countries. *Review of Development Economics*, *11*(4), 607-620.
35. Singh, H., Jun, K.W. (1999). *Some New Evidence on Determinants of Foreign Direct Investment in Developing Countries* (World Bank Policy Research Working Paper, November 1999).
36. Tsai, P. (1994). Determinants of Foreign Direct Investment and its Impact on Economic Growth. *Journal of Economic Development*, *19*(1), 137-163.
37. Walsh, J. P., & Yu, J. (2010). *Determinants of Foreign Direct Investments: A Sectoral and Institutional Approach* (IMF Working Paper, WP/10/187).

Milan Nedeljković

is a professor at FEFA, Metropolitan University, an external affiliate at CESifo, Munich, and a senior consultant at the World Bank, Washington, DC. His research interests include econometrics, machine learning, and international finance. Beyond the academic work, he is the co-founder and managing partner of the award-winning company producing AI-based software solutions for financial and FMCG industries.

Ivana Todorović

is an assistant professor at FEFA, Metropolitan University, where she teaches Banking in the undergraduate program. She defended her Ph.D. thesis entitled "Monetary and Macroprudential Policy in the Euroized Economy" in 2020 at the Faculty of Economics, the University of Belgrade. She was awarded the award of the Scientific Society of Serbian Economists for the best doctoral dissertation defended in 2019 and 2020, as well as the first award of the National Bank of Serbia "Aleksa Spasić" for the best scientific research work in the field of monetary economy, supervision of financial institutions, and financial stability (in 2016). She is a member of the Association of Financial Analysts of Serbia (CFA Society Serbia) and the Scientific Society of Economists of Serbia (NDES).

ORIGINAL SCIENTIFIC PAPER
UDK: 332.122:338.45(497.11)
DOI: 10.5937/EKOPRE2404182L
Date of Receipt: November 21, 2023

Milena Lutovac Đaković
University of Belgrade
Faculty of Economics and Business
Department for Economic Policy and Development

NEW INDUSTRIAL POLICY OF SERBIA: POSSIBILITIES AND LIMITATIONS

Nova industrijska politika Srbije - mogućnosti i ograničenja

Abstract

Numerous factors have contributed to the growing interest in industrial policy. In recent years, industrial policy has been increasingly used as a response to crises. Developed countries of the world strongly intervened in their industries after the global economic crisis in 2008, and it has become much more intense after the crisis caused by the COVID-19 pandemic (with the goal of restarting economic growth). Finally, industrial policy has become a significant instrument for the industrial transition to a green and digital economy. The goal of the new industrial policy of Serbia is to promote structural changes in the industry in favor of the production of goods and services with greater added value, modernization and increasing the role of industry. New industrial policy has become more complex with new goals beyond conventional industrial development and structural changes, such as integration and upgrading into global value chains (GVCs), developing a knowledge-based economy, building sectors related to sustainable development goals and competitive positioning for a new industrial revolution [12, p. 199]. The paper analyzes the effects of state aid in 72 successfully implemented investment projects to attract investment in Serbian industry in the period from 2006 to 2016. Four bootstrap confidence intervals were used: bootstrap-t interval, percentile interval, BCa interval, and ABC interval. The constructed intervals give us information on the assessment of the average number of newly created jobs and average investments in realized projects in the period from 2006 to 2016.

Keywords: *industrial policy, state incentives, bootstrap method, new industrial policy of Serbia*

Sažetak

Brojni faktori su doprineli većem interesovanju za industrijsku politiku. U novije vreme, industrijska politika se sve češće koristi kao odgovor na krize. Razvijene zemlje sveta su snažno intervenisale u svojim industrijama nakon svetske ekonomske krize 2008. godine, da bi to postalo mnogo intenzivnije nakon krize izazvane pandemijom COVID-19 (sa ciljem da ponovo pokrenu privredni rast). Konačno, industrijska politika je postala značajan instrument za industrijsku tranziciju prema zelenoj i digitalnoj ekonomiji. Cilj nove industrijske politike Srbije je da promoviše strukturne promene u industriji u korist proizvodnje roba i usluga sa većom dodatom vrednošću, modernizacijom i povećanjem uloge industrije. Nova industrijska politika postala je složenija sa novim ciljevima izvan konvencionalnog industrijskog razvoja i strukturnih promena, poput integracije i nadogradnje u globalne lance vrednosti, razvoj ekonomije zasnovane na znanju, izgradnju sektora vezanih za ciljeve održivog razvoja i konkurentno pozicioniranje za novu industrijsku revoluciju [12, p. 199]. U radu se analiziraju efekti državne pomoći u 72 uspešno realizovana investiciona projekta za privlačenje investicija u industriju Srbije od 2006. do 2016. godine. Za istraživanje ovog pitanja korišćena su četiri *bootstrap* intervala poverenja: *bootstrap-t* interval, percentilni interval, BCa interval i ABC interval. Konstruisani intervali nam daju informaciju o oceni prosečnog broja novootvorenih radnih mesta i prosečnih investicija kod realizovanih projekata u periodu od 2006. do 2016. godine.

Ključne reči: *industrijska politika, državni podsticaji, bootstrap metod, nova industrijska politika Srbije*

Introduction

Industrial policy is defined as a "concerted, focused, conscious effort on the part of government to encourage and promote a specific industry or sector with an array of policy tools" [33, p. 14]. A commonly used and widely cited definition is that of Pack and Saggi, who defined industrial policy as "any type of selective intervention or government policy that attempts to alter the structure of production toward sectors that are expected to offer better prospects for economic growth than would occur in the absence of such intervention" [33, p. 16]. Rodrik uses the term "industrial policy" to denote policies that stimulate specific economic activities and promote structural change [19, p. 4]. A number of factors have led to the growing interest in industrial policy. Although there is a wide range of definitions of industrial policy, in this paper we decided to use one proposed in the Industrial policy strategy of the Republic of Serbia from 2021 to 2030, "industrial policy is a set of objectives and measures defining the intended Government intervention in the industry structure segment so as to promote general economic growth" [28, p. 7].

Firstly, the success of East Asian countries is often linked to industrial policy. The role of the "good state" is to generate and implement policies to mitigate the consequences of market failures. Countries like South Korea, Taiwan, and China have not developed suddenly just by improving their institutions, but with industrial policies that have overcome market barriers [9, p. 5], [11, p. 356], [18, p. 147]. "Economists from developing countries were concentrated on explanation of the necessity for industrial policy as a lever for convergence and catch up" [3, p. 235].

Secondly, there is a consensus among economists that the COVID-19 pandemic has only worsened the problems of economies and societies around the world, which were serious and evident long before it [1, pp. 293-299], [14, p. 18], [22, p. 1], [7, pp. 1-15]. Increasing inequality within and between countries, the social exclusion of millions of people around the world and the unsustainability of modern patterns of production and consumption, all combined with the atrophy in the capacity of state institutions is the result of unjustified reliance on the invisible hand of the market. The impact of the COVID-19 pandemic on different social classes, generations, social groups, countries is indisputable and has only just begun to be revealed [17, p. 1], [16, p. 1], [23, p. 2]. However, it had the greatest impact on the most vulnerable social groups and economies that were already in danger [27, pp. 280-286].

Thirdly, the high costs caused by the COVID-19 pandemic around the world encourage us to make fundamental changes in our economic and social systems [8, pp. 359-381], [6, p. 20], [14, p. 18]. Strengthening the industrial sector is the key to the recovery. "To achieve this important goal, industrial policies must be at the center of governments' reactions" [25, p. 1]. Sustainable development goals (SDGs) need to be put at the center of industrial strategy. "The post-pandemic recovery must be transformative, and countries should place a primary focus not only on economic growth but also on the direction of growth" [25, p. 1]. The current situation offers an opportunity to place social responsibility and environmental awareness firmly at the center of the decision-making process, and to redefine the paradigm of the link between production dynamics, well-being, and sustainability.

Finally, industrial policy is increasingly seen as a powerful instrument for the industrial transition to a green and digital economy [5, p. 1]. Industrial policy is considered as the main part of recovery strategies of renewal for the necessity of government intervention. Governments in many countries clearly promote actions intended for their manufacturing sectors [26, p. 6]. As the dynamics of production in each state are greatly under the influence of crisis, renewed industrial policy must be part of the response for solving economic and social problems [25, p. 1].

The specific strategic goals of the new Serbian industrial policy are to improve the competitiveness of Serbian industry and build sectors connected to the goals of sustainable development through competitive integration for Industry 4.0 [12, p. 205].

The subject of research in this paper is the analysis of the effects of state incentives in successfully implemented investment projects to attract investments in Serbian industry. The paper has four parts. As part of the first, an overview of changes in the perception of the industrial

policy of Serbia over time was given. The second part of the paper explains the concept of the new industrial policy of Serbia. After a brief review of the state incentives for attracting investments and new employment in the Republic of Serbia in the period from 2006 to 2018, the fourth part of the paper follows a detailed explanation of the methodological procedure used. The bootstrap method was used in the research. Four bootstrap confidence intervals were used: bootstrap-*t* interval, percentile interval, BCa interval and ABC interval. Constructed intervals give us information about the average number of newly created jobs and average investments in realized projects in the period from 2006 to 2016. Empirical research was done as part of Milena Lutovac's PhD thesis.

Industrial policy of Serbia: Changing perception over the course of time

Industrialization was the basic model of our country's development after the Second World War. Achieved industrial growth and the attained level of development were the basis of economic development of the former Yugoslavia, which was based on the strategy of import substitution. The collapse of post-war industrialization began with the process of the disintegration of the former Yugoslavia and continued into the first decade of the 21st century. Serbian industry has a large number of problems (low-tech, unequal regional development, low export competitiveness, unfavorable structure of industrial production...). "All efforts during the past two decades were focused on reviving economic growth. Initially, the main source of growth was consumer demand financed by external grants and privatization proceeds, followed by industrial revival and new jobs financed by external borrowing and strong FDI flows" [32, p. 161]. Serbian industry is facing great challenges. "The crisis for the most part could be explained by political and professional inability to find the right answers to inherited and evolving geopolitical challenges as well as limited economic policy capacity to respond quickly and adequately to old and emerging macroeconomic imbalances" [2, p. 2].

There is a pressing need to replace the current strategy for the development of Serbian industry to contribute to economic progress and raise living standards in Serbia. Based on the experience of successful countries, it can be seen that after a certain stage of development, they replaced the strategy of import substitution with the strategy of export expansion. Although it cannot be expected that the path of development characteristic of the developed countries of the world will be copied to Serbia, the most acceptable strategy of industrialization for our country would be the strategy of export expansion.

In order to implement the strategy of export expansion, it is necessary to increase the competitiveness of Serbian industry. It requires the development of a modern industrial structure, production diversification of industry and systematic expansion of the production and export economic base. To achieve all the aforementioned objectives, the basic condition is the development of competitiveness at all levels, from individual companies, through industries, to the national economy as a whole.

The industrial policy goals that are determined must be based on realistic foundations. At the same time, they should take into account institutional capacity and the level of economic development.

In addition, the new industrial policy is needed, "which must be in the function of supporting the chosen directions of development" [21, p. 498]. The goal of Serbia's new industrial policy is to promote structural changes in the industry towards the production of goods and services with higher added value, modernization, and an increased role of industry. The new industrial policy has become more complex, encompassing new goals beyond conventional industrial development, such as integration into global value chains, the development of a knowledge-based economy, building sectors related to sustainable development goals (SDGs), and competitive positioning for Industry 4.0. However, even though technology-intensive industries should be a major part of the new industrial structure, traditional industries (textiles, leather and footwear, and the furniture industry) should not be ignored. As traditional industrial sectors dominate in Serbian industry, their further development should continue only with the application of digital technologies. Bearing in mind that the level of development of a country is reflected in the structure of its exported goods, intensive digitalization

of these sectors could enable Serbia to raise the level of added value and increase exports. Monitoring the ongoing digital transformation leads to the need to master new skills. The advantages of electronic over traditional business are evident in increased quality and efficiency, but also lower sales prices, reduced time to market and the implementation of various transactions [30, p. 1].

Having in mind that the Communication of the European Commission from March 2020 and the Action Plan for the implementation of the Industrial Policy Strategy of the Republic of Serbia from 2021 to 2030, for the period from 2021 to 2023 [15, p. 1], are two most important guidelines for economic growth and recovery, state digitalization and the circular economy, the activities were focused on digitalization, innovation, investment, export restructuring and the circular economy.

The biggest negative effects of the COVID-19 pandemic on economic activity in Serbia were felt in April 2020. According to the estimates of the Statistical Office of the Republic of Serbia, the decline in domestic demand led to a year-on-year GDP decrease of approximately 6.3% in the second quarter of 2020. The decline in the GVA industry in the second quarter of 2020 was 7.6%, year-on-year. The decline was influenced by a significant slowdown in external demand, difficult transport, and temporary disruption in global supply chains [15, p. 1].

From May 2020, a recovery followed, partly encouraged by the measures taken by the government. Due to the implemented measures, the recovery in most production and service activities was faster than expected. The decline in industrial production slowed to 9.3% in May 2020, and already in the subsequent months, positive year-on-year growth rates were achieved, which are the result of an increase in the production volume of the manufacturing industry.

To reduce the negative effects of the COVID-19 crisis and provide conditions for faster growth of the industry, it is necessary to work on approaching innovative and technology-intensive sectors, investing in human capital, attracting investment projects which engage high-level technology, high added value and significant spillover effects, better education and training in accordance with the requirements of the economy and the circular economy, the use of the advantages of digital technologies [30, p. 1]. The implementation of the Smart Specialization Strategy in the Republic of Serbia is one of the key documents adopted by the Government of the Republic of Serbia in order to develop a knowledge-based society [29, p. 1].

The concept of the new industrial policy of Serbia

The key driver of the future growth of Serbian industry is the increase in productivity and competitiveness in accordance with the macroeconomic situation in the country. The specific strategic goals of the new Serbian industrial policy are to improve the competitiveness of Serbian industry and build sectors connected to the goals of sustainable development through competitive integration for Industry 4.0 [12, p. 205].

Industrial policy represents a vision for the future development of industry. The vision of Serbia's new industrial policy is to create a favorable business environment through various activities, eliminate government and market failures, satisfy the specific needs of individual sectors with products and services of high added value, all aimed at increasing the competitiveness of the industry, the development of sustainable sectors, and positioning Serbian industry competitively for the Fourth Industrial Revolution.

By developing a new strategy of industrial development, the Republic of Serbia at the same time lays the foundation for defining the basic directions of economic development. When setting goals, the priority must be to strengthen national competitiveness, i.e. to increase the competitiveness of industry. In order to increase competitiveness, it is necessary to make the business environment more favorable.

The goal of the new industrial policy of Serbia is to promote structural changes in the industry in favor of the production of goods and services with greater added value, modernization and increasing the role of industry. Certain strategic goals and sub-goals are:

- Improving the competitiveness of Serbian industry,
- Increasing investments in Serbia's industry,
- Increasing the export of domestic products with higher added value,

- Developing a high level of workforce skills and improving the quality of education,
- Establishing sectors related to sustainable development goals and competitive positioning for the Fourth Industrial Revolution [12, p. 205].

Policymakers need to choose a particular development path and apply a range of different measures that affect the industry's movement toward that path. Industrial policy instruments serve as tools available to governments for implementing industrial policy. They range from direct and indirect support to specific firms and industries (grants, subsidies, loans, tax breaks) to very broad ones, which include all government initiatives to improve business. For many years, selective industrial policy instruments have been used. They were most often related to the protection of young industry and applied at the sector, branch, and enterprise levels. After that, non-selective instruments have been made available, affecting all industry entities equally.

The instruments of the new industrial policy of Serbia must be harmonized with the requirements imposed by the EU candidate status. Direct state intervention measures must be reduced to a minimum and have a limited lifespan. "The key to the success of state incentive reforms lies in the reallocation of incentives to those sectors that eliminate market failures and thus affect the increase in living standards" [20, p. 261].

Industrial policy, with its instruments and measures, can intervene only in cases of market failure and in the process of implementing structural adjustments in sectors where it is most needed. Preference should be given to non-selective instruments of a general type that will facilitate the creation of favorable business environment for faster product, enterprise, or industry development [24, p. 161].

Proposed instruments for basic industrial policy aimed at supporting business and regional development include subsidies, loans, favorable loans, guarantees [10, p. 24], "state incentives of small value" (*de minimis* state incentives) [10, p. 29], promotion of business startups (business incubators, accelerators, micro loans, startup capital, training for business startups, micro and small enterprises, development of human resources), development of infrastructure and connection of industrial centers, and adoption of EU standards [12, p. 212].

Further in this paper, incentives for attracting the investments and new employment in Republic of Serbia in the period from 2006 to 2018, as one of the instruments of industrial policy of Serbia, are introduced.

Incentives for attracting investments and new employment in the Republic of Serbia in the period from 2006 to 2018

In the period from 2006 to January 1, 2019, a total of 381 projects were supported with funds from the Budget of the Republic of Serbia for attracting investments and encouraging new employment, of which 168 domestic and 213 foreign, with 632,156,352.04 euros (see Table 1). In that period, incentive funds were paid or have been paid for 274 projects, of which 133 projects have been successfully completed, 66 are in the process of monitoring, and there are 75 active projects. Incentives in the total amount of 538,380,602.2 euros were allocated for the realization of these projects. In the same period, 107 contracts were terminated, of which 80 were domestic and 27 foreign investors. 79,481,109.10 euros were set aside for these projects, and 25,222,650.66 euros were paid until the termination of the contract, while court disputes are being conducted for the amount of 22,228,525.66 euros. The most common reason for termination of the contract is non-fulfillment of contractual obligations (impossibility of realization or withdrawal from investments).

During the signing of the contract on the allocation of incentive funds, 102,576 new jobs are planned, 6,947 in projects implemented by domestic investors and 75,790 in projects implemented by foreign investors. Due to the termination of the contract, the planned employment was reduced by 19,839 new workers, 7,182 in projects implemented by domestic investors and 12,657 in projects implemented by foreign investors [12, p. 135].

Empirical research

In this paper, the author analyzed the employment of 72 successfully implemented investment projects in the period from 2006 to 2016, to which incentive funds were allocated. The term a "completed project" means that

Table 1: Overview of investment projects accomplished in the 2006-2019 period according to the origin of the investor

Project status	Origin of the investor	Number of the projects	Investment value in euros	Number of new hires	Value of incentives granted in euros	Value of paid incentives in euros
Projects which are implemented or are in the process of implementation	Domestic	88	222,208,067.5	6,947	39,268,246.74	24,524,109.3
	Foreign	186	1,980,809,108	75,790	513,406,996.2	364,102,160
	Domestic and foreign	274	2,203,017,175,5	82,737	552,675,242.94	388,626,269.3
Terminated projects	Domestic	80	241,875,456	12,657	376,081.25	10,214,850.66
	Foreign	27	120,251,561	7,182	79,105,027.85	15,007,800
	Domestic and foreign	107	362,127,017	19,839	79,481,109.10	25,222,650.66
Total	Domestic	168	464,083,523.5	19,604	39,644,327.99	34,738,959.96
	Foreign	213	2,101,060.669	82,972	592,512,024.05	379,109,960
	Domestic and foreign	381	2,565,144,192.5	102,576	632,156,352.04	431,848,919.96

Source: Author's processing based on database of the Ministry of Economy

investments have been made, new employees were hired, the monitoring period was completed, the number of new employees was kept. Empirical research on these companies was conducted using a different method outlined in the work of Savić and Lutovac [20, p. 261].

The decision to analyze only successfully implemented projects during this period stems from the fact that it only makes sense to talk about the effects of investment incentives in such projects. Taking into account that: "in the case of active projects, the allocated funds are paid in installments, in accordance with the Agreement, and the beneficiary is obliged to report to the Ministry on the implementation of the investment project for which the funds were allocated." [31, p. 10], it becomes clear that analyzing the effects of incentives makes sense when the contractual obligations end, in order to see what the state of the company's development indicators is without incentives.

Application of bootstrap method

In this paper, the bootstrap method was used for empirical research on the impact of incentives in the industry on selected development indicators of the Serbian economy. This method represents one of the resampling methods. During its application, a great number of resamples are generated from the original sample, all of which are of the same size as the original sample. In each resample, values of some statistics are calculated, and a bootstrap distribution is generated that way. Using this distribution, it is possible to construct various parameter estimate intervals. The most common intervals used in literature are the following four: bootstrap-*t* interval, percentile interval, BCa interval, and ABC interval [4, pp. 184-186]. Through various comparisons with standard intervals, it was observed that the bootstrap method provides more accurate interval estimates. Therefore, in this paper, the bootstrap method is preferred over traditional methods. The bootstrap-t interval is determined based on the percentile of the bootstrap distribution of the Studentized statistic. The percentile interval is determined using the percentiles of the bootstrap distribution of the considered statistic. The BCa (bias-corrected and accelerated) interval uses two constants when determining percentiles: acceleration and bias-correction. ABC interval is approximation of BCa bootstrap confidence intervals.

The constructed intervals give us information on the assessment of the average number of newly created jobs and average investments in implemented projects in the period from 2006 to 2016. A confidence level of 95% was used, which means that with 95% confidence it can be claimed that the mean value is in the estimated intervals.

The determination to analyze only completed projects lies in the need to establish whether investment projects implemented through incentives have clear and measurable effects on established economic and industrial development goals.

Interval estimate of average employment per project

Using a sample[1] of 72 implemented investment projects, in which funds from the Ministry of Economy were allocated, in the period from 2006 to 2016, it is possible to estimate

1 In the further work, it will be assumed that these realized investment projects represent a random sample selected from the set of all implemented projects.

the average employment in all implemented projects in the previous period. Bootstrap confidence intervals can be used for this purpose: bootstrap-*t* interval, percentile interval, BCa interval and ABC interval [4, pp. 184-186]. In the case of using 95% confidence level, the interval estimates given in Table 2 are obtained.

Table 2: 95% bootstrap confidence intervals for the average number of newly created jobs per project

Confidence intervals	Lower boundary	Upper boundary
Percentile interval	141.7431	285.2500
BCa	137.4642	275.3141
ABC	148.7932	305.8364
Bootstrap-t	132.3203	278.8741

Source: Based on MATLAB output

Table 2 shows that the interval estimates are approximately the same width for bootstrap-*t* (132.3203; 278.8741), percentile (141.7431; 285.2500), and ABC method (148.7932; 305.8364). However, the most precise interval (which is expected) is the BCa interval whose range is from 137.4642 to 275.3141. Thus, with 95% confidence, it can be claimed that the average employment in all implemented projects is in the range from 137.4642 to 275.3141.

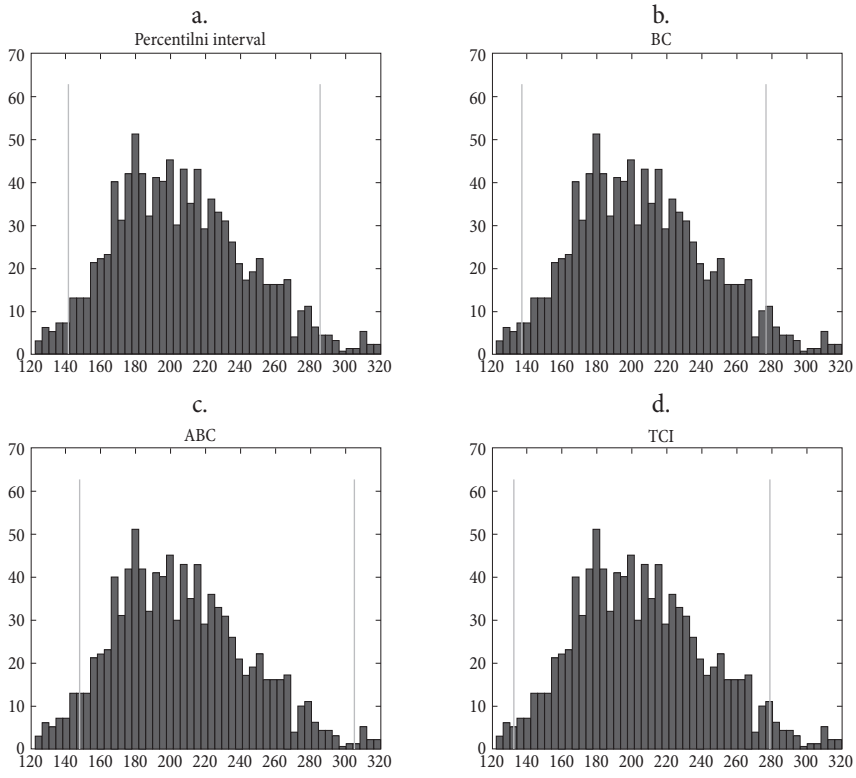
In addition to the tabular presentation, Figure 1 shows histograms of the corresponding bootstrap distributions, with the interval boundaries indicated.

From Table 2, it can be seen that the bootstrap-*t*, percentile and ABC intervals have approximately the same width. Wider confidence interval has lower precision, so it can be said that the most precise interval is obtained using the BCa method and is of the form (137.4642; 275.3141). Consequently, it can be claimed with 95% confidence that the average number of newly created jobs in completed projects is between 137 and 275. Based on the results obtained, it can be concluded that job creation incentives have a positive effect on employment growth in Serbian industry.

Interval estimates of average investments

The bootstrap confidence intervals for the assessment of average investments in all implemented projects in the previous period are shown in Table 3. In the case of using 95% confidence level, the interval estimates given in Table 3 are obtained.

Figure 1: Bootstrap distribution and different confidence intervals for average number of newly created jobs per project (a. percentile interval, b. BCa interval, c. ABC interval, d. bootstrap-t interval)



Source: MATLAB output

Table 3 shows that the interval estimates are approximately the same width for bootstrap-*t* (3.7117; 8.3248), percentile (3.9816; 8.4047), and ABC method (3.6972; 8.2969). The most accurate is again the BCa interval whose boundaries are from 4.3108 to 8.6114. Thus, with 95% confidence, it can be claimed that the average level of investment per project is in the range of 4.3108 to 8.6114 million euros.

Table 3: 95% bootstrap confidence intervals for average investments in all implemented projects

Confidence intervals	Lower boundary	Upper boundary
Percentile interval	3.9816	8.4047
BCa	4.3108	8.6114
ABC	3.6972	8.2969
Bootstrap-t	3.7117	8.3248

Source: Based on MATLAB output

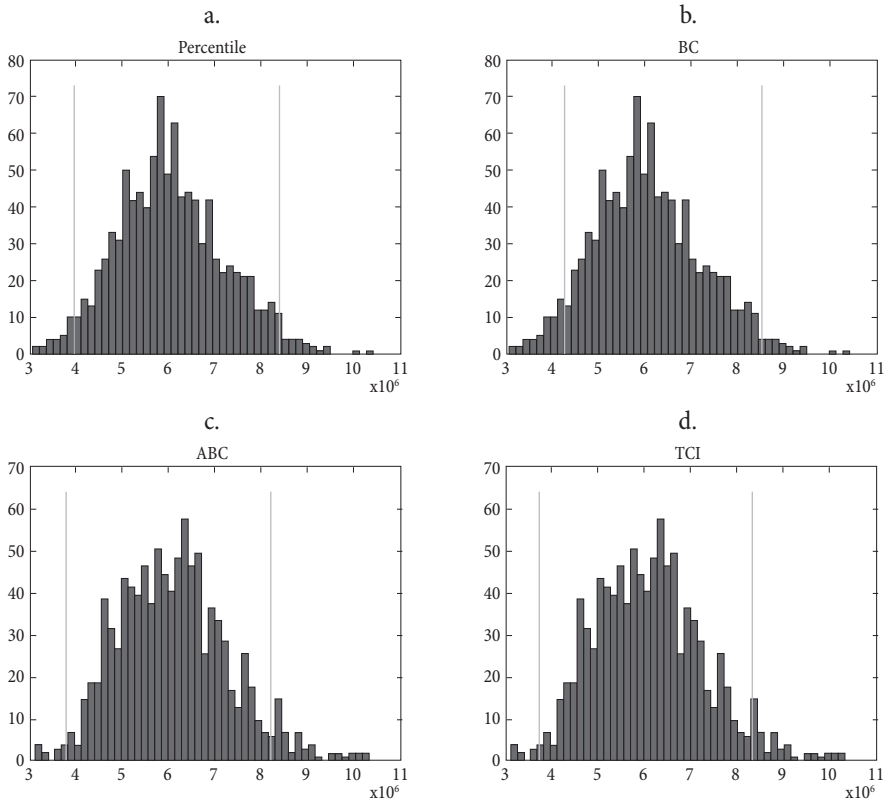
In addition to the tabular presentation, Figure 2 shows histograms of the corresponding bootstrap distributions, with the indicated interval limits.

From Table 3, it can be seen that the bootstrap-*t*, percentile and ABC intervals have approximately the same width. The most accurate interval was obtained using the BCa method and is in the form of (4.3108; 8.6114). The rated intervals provide information on the estimate of the average level of investments per project. A confidence level of 95% was used, which means that with 95% confidence it can be expected that the mean value of investments is in the interval from 3.7117 to 8.6114 million euros. Since the compressed investment confidence intervals are quite wide, it can be concluded that, under the existing circumstances, investment activity in the given sample is quite heterogeneous in nature. Under existing conditions, average investments are unlikely to go outside the constructed interval. Finally, the introduction of incentive programs for direct investments, especially direct financial incentives in combination with other factors had a positive effect in increasing the number of investment projects implemented in the Republic of Serbia.

Conclusion

Increasing the competitiveness of Serbian industry is the first and basic goal of Serbia's new industrial policy.

Figure 2: Bootstrap distribution and different confidence intervals for average investments per project (a. percentile interval, b. BCa interval, c. ABC interval, d. bootstrap-t interval)



Source: MATLAB output

The establishment of sectors related to the sustainable development goals and competitive positioning for the new industrial revolution is identified as the second goal of the new industrial policy of Serbia. Digitization is at the core of the new industrial revolution. Relying on new sectors in the field of digital technologies and strengthening traditionally strong sectors, Serbian industry can take advantage of the potential opportunities offered by the Fourth Industrial Revolution, thereby securing its place in new markets for future products and services. Achieving this goal is only possible with interventions in other areas such as: strengthening of human resources, innovation, investments, international dimension, and circular economy.

Different measures and instruments can be used to achieve the goals of Serbia's new industrial policy. The new industrial policy of Serbia, with its instruments and measures, can intervene in the process of implementing structural changes in the sectors where it is most needed. Nevertheless, emphasis should be placed on those instruments that will influence the creation of a favorable business environment for faster development of products, companies, or branches (of the chosen development directions) related to Industry 4.0 [12, p. 205].

The European Commission has given a recommendation for reducing the general level of state aid and moving from sectoral to horizontal incentives. The emphasis is on achieving horizontal goals related to employment, regional development, environmental protection, training and research and development. Unlike the European Union, where an average of 0.6% of GDP is allocated for state incentive, in the Republic of Serbia, this amount ranges between 2-3% of GDP. In this sense, the Republic of Serbia would have to gradually reduce state incentives in the coming period [12, p. 173].

Based on the empirical analysis carried out in the paper, it can be concluded that the incentives of the Government of the Republic of Serbia, aimed at increasing the number of new jobs and investments, have a positive effect on employment growth and the increase in the number of investment projects implemented in the Republic of Serbia.

In the process of researching incentives, the question remains whether the nature of the program to attract direct investments was optimally designed, and to what extent it was really aimed at attracting investments versus facilitating projects that might have been realized even without direct financial incentives. In addition, by giving subsidies, an effort was made to create as many new jobs as possible, even if they were for a low-skilled workforce. For the above reasons, it is necessary to change the defensive development strategy, where the demands imposed by investors are practically accepted unconditionally and there are no clear conditions that must be met by investors.

References

1. Anand, P., Ferrer, B., Gao, Q., Nogales, R., & Unterhalter, E. (2020). COVID-19 as a capability crisis: Using the capability framework to understand policy challenges. *Journal of Human Development and Capabilities, 2(3),* 293-299.
2. Đuričin, D., & Vuksanović Herceg, I. (2019). Three things an economy needs in the era of the fourth industrial revolution. *Ekonomika preduzeća, 67*(1-2), 1-15.
3. Đuričin, D., & Vuksanović, I. (2014). Quest for new development model and economic policy platform for Serbia: The role of industrial policy. *Ekonomika preduzeća, 62*(5-6), 229-250.
4. Efron, B., & Tibshirani, R. J. (1993). *An Introduction to the Bootstrap*. Chapman and Hall CRC: Florida, USA, pp. 184-186.
5. Europski gospodarski i socijalni odbor. (2020). *Industrijska tranzicija prema zelenom i digitalnom europskom gospodarstvu: Regulatorni zahtjevi i uloga socijalnih partnera i civilnog društva*. Europski gospodarski i socijalni odbor.
6. Fernandes, N. (2020). *Economic effects of coronavirus outbreak (COVID-19) on the world economy*. IESE Business School Working Paper No. WP-1240-E.
7. Ferrannini, A., Barbieri, E., & Di Tommaso, M. (2021). Industrial policy for sustainable human development in the post-Covid19 era. *World Development, 137,* January 2021, 1-15.
8. Hepburn, C., O'Callaghan, B., Stern, N., Stiglitz, J. E., & Zenghelis, D. (2020). *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?* Oxford Smith School of Enterprise and the Environment, Working Paper No. 20 02, 359-381.
9. Holcombe, R. (2013). South Korea's economic future: Industrial policy, or economic democracy? *Journal of Economic Behavior & Organization, 88,* 3-13. Amsterdam: Elsevier.
10. Izveštaj o dodeljenoj državnoj pomoći u Republici Srbiji 2018. godine. (2018). Republika Srbija: Komisija za kontrolu državne pomoći, 24-29.
11. Lim, W. (2013). The Chaebol and Industrial Policy in Korea. *The Industrial Policy Revolution I, The Role of Government Beyond Ideology*, eds. J. Stiglitz and J. Yifu Lin. New York: Palgrave Macmillan.
12. Lutovac, M. (2020). *Nova industrijska politika kao pretpostavka efikasnog razvoja industrije Srbije*. Doktorska disertacija. Beograd: Ekonomski fakultet.

13. MATLAB2017
14. Mazzucato, M. (2020). *The Covid-19 crisis is a chance to do capitalism differently.* The Guardian, 18 (2020). Retrieved from https://www.theguardian.com/commentisfree/2020/mar/18/the-covid-19-crisis-is-a-chance-to-do-capitalism-differently
15. Ministarstvo privrede Republike Srbije. (2021). *Akcioni plan za sprovođenje Strategije industrijske politike Republike Srbije od 2021. do 2030. godine, za period od 2021. do 2030. godine*. Retrieved from https://privreda.gov.rs/sites/default/files/documents/2021-08/Akcioni-Plan-2021-2023-Industrijska-Politika.pdf
16. OECD. (2020*). COVID-19: Protecting people and societies, Tackling coronavirus (Covid19) - Contributing to a global effort.* Paris: OECD.
17. Rodrik, D. (2020). *Reshaping Economic Strategy after COVID-19*. OECD: New Approaches to Economic Challenges. Retrieved from https://www.oecd.org/naec/events/will-covid-19-remake-the-world.htm
18. Rodrik, D. (2013). *Paradoks globalizacije*. Beograd: Služ̌beni glasnik.
19. Rodrik, D. (2008). Industrial policy: Don't ask why, ask how. *Middle East Development Journal, Demo Issue (2008)*. 1-29, Economic Research Forum.
20. Savić, Lj., & Lutovac, M. (2019). Industrial policy and state incentives in Serbia. *Ekonomika preduzeća, 67*(3-4), 261-272.
21. Savić, Lj. (2017). *Ekonomika industrije*. Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu.
22. Sen, A. K. (2020). A better society can emerge from the lockdowns. Financial Times, 15 April 2020. Retrieved from https://www.ft.com/content/5b41ffc2-7e5e-11ea-b0fb-13524ae1056b
23. Stiglitz, J. (2020). *Recovering from the pandemic: an appraisal of lessons learned*. Foundation for European Progressive Studies.
24. UNCTAD. (2018). *World Investment Report 2018, Investment and New Industrial Policies*. United Nations: New York and Geneva.
25. UNIDO (2020). *Industrial policy and the road to the recovery.* Retrieved from https://www.unido.org/news/industrial-policy-and-road-recovery
26. United Nations. (2009). *The relationship between competition and industrial policies in promoting economic development*. Geneva: United Nations Conference on Trade and Development.
27. Venkatapuram, S. (2020). Human capabilities and pandemics. *Journal of Human Development and Capabilities*, *21*(3), 280-286.
28. Vlada Republike Srbije. (2020). Industrijska strategija. Strategija industrijske politike Republike Srbije od 2021. do 2030. godine. Beograd: Vlada Republike Srbije.
29. Vlada Republike Srbije. (2020). Strategija pametne specijalizacije u Republici Srbiji 2020-2027. Beograd: Vlada Republike Srbije. Retrieved from https://mpn.gov.rs/wp-content/uploads/2021/12/Strategija-pametne specijalizacije_SR_WEB.pdf
30. Vlada Republike Srbije. (2020). Strategija razvoja digitalnih veština u Republici Srbiji za period od 2020. do 2024. godine, 1. Retrieved from http://www.pravno-informacioni-sistem.rs/SlGlasnikPortal/eli/rep/sgrs/vlada/strategija/2020/21/2/reg/
31. Vlada Republike Srbije. (2019). Uredba o uslovima i nač̌inu privlač̌enja direktnih investicija: 1/2019, č̌lan 15. Beograd: Vlada Republike Srbije.
32. Vujović, D. (2022). Innovations, productivity and growth: reform and policy challenges for Serbia. *Ekonomika preduzeća, 70*(3-4), 161-178.
33. Warwick, K. (2013). *Beyond Industrial Policy: Emerging Issues and New Trends*. OECD Science, Technology and Industry Policy Papers, No. 2. Paris: OECD Publishing.

Milena Lutovac Đaković

is an assistant professor at the Faculty of Economics and Business, University of Belgrade. At the undergraduate level, she teaches the following courses: Industrial Economics and Technological Development and Policy. Also, she teaches the following master courses: Industrial Policy and Economic Development, Modern Trends in Global Economy, Scientific and Technological Policy and Economic Development. She is the author of a large number of papers in the field of industrial policy and a participant in numerous domestic and international conferences.

ORIGINAL SCIENTIFIC PAPER
UDK: 336.225.66(497.11)
339.13:336.221.4
339.727.22(497.11)"2001/2019"
DOI: 10.5937/EKOPRE2404192D
Date of Receipt: February 17, 2024

Ivana Domazet
Institute of Economic Sciences
Belgrade

Darko Marjanović
Institute of Economic Sciences
Belgrade

NON-FISCAL LEVIES AND OTHER TAXES IN THE FUNCTION OF SERBIA'S FISCAL COMPETITIVENESS

Nefiskalni nameti i druge dažbine u funkciji poreske konkurentnosti Srbije

Abstract

Fiscal policy, as an integral part of the tax competitiveness of the state, is a powerful tool for attracting foreign investments. When designing tax policy, the state tries to reduce the burden and help attract new investments to the country, i.e. prevent them from flowing out. Accordingly, the goal of this paper is to determine whether non-fiscal levies and other taxes affect the fiscal competitiveness of Serbia. More specifically, whether the business of foreign investors in Serbia depends on the level of non-fiscal levies and other taxes imposed in Serbia. In order to collect primary data, an online survey was conducted with the participation of 88 (from abroad) investors in Serbia in 2001-2019. The research method used was a one-factorial analysis of variance of different groups (ANOVA) and a t-test for independent samples. The results show that non-fiscal levies have a significant impact on tax competitiveness. Namely, foreign investors consider non-fiscal levies to be an extremely important factor when it comes to doing business in Serbia. As for the other taxes analysed (customs duties, excise duties, contributions, and fees), their importance for foreign investors' is neutral and therefore not decisive when choosing Serbia as an investment location.

Keywords: *non-fiscal levies, contributions, customs duties, fees, excise duties, tax competitiveness*

Sažetak

Fiskalna politika, kao sastavni deo poreske konkurentnosti države, predstavlja moćan instrument za privlačenje stranih investicija. Pri kreiranju fiskalne politike država nastoji da kroz smanjenje poreskog opterećenja doprinese povećanju investicija, odnosno sprečavanju njihovog odliva iz zemlje na druge lokacije. Shodno tome, cilj ovog rada jeste da utvrdi da li i u kojoj meri nefiskalni nameti i druge dažbine utiču na poresku konkurentnost Srbije. Konkretnije, da li je poslovanje stranih investitora u Srbiji uslovljeno visinom nefiskalnih nameta i drugih dažbina koje se primenjuju u Srbiji. Za prikupljanje primarnih podataka korišćeno je anketno online istraživanje u kom je učestvovalo 88 stranih investitora koji su u periodu od 2001. do 2019. godine uložili kapital u Srbiju. Korišćena metodologija istraživanja bila je jednofaktorska analiza varijanse različitih grupa (ANOVA) i t-test nezavisnih uzoraka. Rezultati istraživanja su pokazali da nefiskalni nameti u značajnoj meri utiču na poresku konkurentnost. Naime, strani investitori nefiskalne namete smatraju izuzetno važnim faktorom kada je u pitanju njihovo poslovanje u Srbiji. Kada je reč o ostalim analiziranim nametima (carine, akcize, doprinosi i naknade), njihov značaj na poslovanje stranog investitora u Srbiji je neutralan i samim tim nemaju odlučujući značaj za investitora prilikom odabira Srbije kao investicione destinacije.

Ključne reči: *nefiskalni nameti, doprinosi, carine, naknade, akcize, poreska konkurentnost*

Introduction

Foreign direct investment (FDI) is a dynamic force that shapes the global economic landscape, contributing to the growth and development of economies worldwide. Understanding global trends in capital movement helps policymakers and businesses make informed decisions to attract and benefit from FDI. Thus, attracting FDI is a common goal for many countries, and it is viewed as a key factor for the success of the national economy on the global stage. While there are clear benefits to attracting FDI, it is essential for countries to balance their economic interests with social and environmental considerations. Creating an attractive business environment, implementing transparent policies, and addressing potential challenges are crucial for sustained success in attracting and retaining FDI.

Tax competition is a strategic approach employed by governments to attract FDI and businesses by implementing preferential tax measures. This competition involves creating an environment with favourable tax conditions compared to other jurisdictions, aiming to encourage businesses to establish operations, invest capital, and conduct economic activities within the country. Tax competition is a dynamic and evolving strategy, and governments need to balance attracting investments with ensuring that the overall tax system contributes to sustainable economic development. It involves continuous efforts to enhance the competitiveness of the country in the global marketplace. Countries that strategically manage their tax policies and provide an attractive overall business environment are more likely to attract FDI and foster economic growth. Creating a favourable environment for investors is crucial to engage in tax competition effectively and attract FDI. Governments and policymakers must establish conditions that make their country an appealing destination for investors. It's important to strike a balance between offering incentives for investors and ensuring that the overall tax system remains fair and contributes to the country's development.

In the pursuit of attracting FDI, countries often leverage tax policy measures as a key tool to enhance their competitiveness on the international capital market. A strategic and well-crafted tax policy can make a country more appealing to foreign investors (FI). In essence, a well-calibrated and investor-friendly tax policy is a crucial component of a country's broader strategy to attract FDI and foster economic growth. It requires a careful balance between providing incentives for investors and ensuring that the tax system contributes to sustainable development. Continuous evaluation, adaptability, and global awareness are essential for success in the competitive landscape of international capital markets.

Given the significant advantages that countries can derive from the inflow of FDI, tax policymakers indeed have a responsibility to regularly review and adapt tax rules to ensure the country remains attractive for FDI. A proactive and adaptive approach to tax policymaking is crucial for maintaining and enhancing a country's attractiveness for FDI. Policymakers must be responsive to changes in the global economy, investor preferences, and industry dynamics to ensure that their tax policies contribute to sustainable economic development. Continuous review and adjustment allow countries to remain competitive and capitalize on opportunities in the ever-evolving landscape of international investments.

The paper is structured in five interconnected parts. After the introductory considerations, the second part of the paper presents the current positions and views of a number of authors on the issue of tax policy, tax competitiveness (TC) and FDI on the basis of the bibliographical reference material. The research methodology is presented in detail in the third part of the paper. The fourth section of the paper offers the empirical results of the research as well as a detailed analysis of the findings, while the fifth section is dedicated to concluding thoughts.

Literature review

The relationship between FDI and economic growth has been extensively examined in economic literature. The authors mention that the relationship between FDI and economic growth is very significant [5], [30], [7]. FDI inflows have the capacity to affect economic growth, competitiveness, financial sector development, and technical progress in the host country, which in turn affects tax revenues (TR) [2]. According to Camara [4], the results for 90 developing countries from 1996 to 2017

using a System GMM estimator strongly suggest that FDI inflows result in a significant increase in TR. Although the influence of taxes on FDI inflows varies widely depending on the type of tax, most empirical research implies that nations with high tax rates would not be as appealing to FDI inflows as countries with low tax rates [17], [6], [18]. FDI promotes economic growth in the host country. FDI increased dramatically between 1984 and 2010, and Spain provided optimal conditions for FDI to have the expected positive effects on growth [3]. According to Đuričin & Vuksanović Herceg [11], Serbia's growth strategy based on FDI may not be sustainable without a demographic bonus typical of developing economies.

Many developing countries' governments strive to encourage inbound FDI by using tax incentives for multinational firms [1], [22], [24]. To encourage FDI, growing EU economies frequently employ tax reduction policies, particularly lowering effective average tax rates [31], [29], [26], [25]. It is necessary to provide stimulant fiscal incentives and subsidies to domestic and FI in R&D, in addition to the support granted to FI in Serbia [9]. To encourage FDI and match investors' expectations, the government continues to grant subsidies. This policy measure generated criticism from some representatives of the business sector, who pointed out that, due to an apparent lack of vision about the targeted structure of output, the government has actually favoured holistic interests of foreigners [10]. FI consider tax incentives, particularly those approved in the income tax system, when making investment decisions [20], [15].

Countries' tax systems face severe competition as the tax base grows more mobile as globalization progresses. Nonetheless, the current stage of globalization indicates a large degree of differentiation at both the national and regional levels [28], [27]. The current level of globalization definitely determines increased competition between countries in terms of the attractiveness of their own tax environment [23], [13]. Where it works, competition thrives. Unfortunately, competition fails in nascent businesses too frequently [12], [19]. The empirical research conducted by Domazet et al. [8] confirms the link between innovation and competitive advantage, describing it as direct and positive.

Horobet et al. [16] highlight the elements determining competitiveness in Central and Eastern European countries, which also influence FI location decisions. The findings indicate that market size, economic digitization, labour force characteristics, and economic potential market are the most important criteria in attracting FDI to the CEE region. Galgánková [14] focused her research on evaluating and comparing the international competitiveness of the Visegrad countries, which included the Slovak Republic, Czech Republic, Hungary, and Poland. She evaluates how countries achieve and sustain economic growth, as well as how competitiveness affects business in all countries. High-quality financial reports increase a company's competitiveness and encourage investors to invest in it. Marjanović and Domazet [21] examined Serbia's TC compared to other European countries, categorizing it by area and globally. According to the findings, the majority of FI consider Serbia's TC is roughly the same as that of other European countries in the surveyed regions. These findings may be of interest to fiscal policymakers, and it is critical that competitiveness improves in the next years since this can have a favourable impact on both FDI inflows and the country's economic growth and development.

Research methodology

The purpose of the conducted research was to determine whether non-fiscal levies and other taxes (customs duties, excise duties, contributions, and fees) affect Serbia's TC. In other words, are non-fiscal levies and other taxes an important factor for a FI when deciding to invest in Serbia? In the empirical research itself, a quantitative approach (using the research method, i.e. the survey technique) was applied. The survey technique based on the use of a structured questionnaire was chosen due to several advantages over other research techniques: (a) it is easy to administer, (b) the responses obtained are consistent as respondents are limited in their answers to a few fixed alternatives and (c) the coding, analysis and interpretation of the data obtained is relatively simple. In view of the possibility of choosing between several data collection techniques (telephone, personal contact, post, e-mail), the electronic survey, i.e. by e-mail, was chosen to conduct

this study. The advantage of conducting the survey by e-mail lies in (a) the speed with which the research can be carried out, (b) the large number of responses that can be obtained in a relatively short time, (c) the relatively low costs (the costs for printing the questionnaires and the postage costs for sending them to the respondents are not taken into account), (d) the quality and quantity of data obtained, (e) the elimination of possible researcher/respondent bias, (f) the much quicker contact with the respondent, (g) the direct monitoring of the respondent's receipt of the survey material. The answers obtained are very consistent. This is due to the fact that the respondents (in this case FI) were limited to a few fixed alternatives when answering.

The research on the impact of the above-mentioned tax forms to which FI investing capital in Serbia are exposed was conducted in the period from September to December 2023. The base group for the research consisted of the 300 largest FI who invested capital in Serbia in the period from 2001 to 2019 (list of investors provided by the Ministry of Economy of the Republic of Serbia). A questionnaire and the accompanying material were sent to the official e-mail addresses of all 300 investors, with the note that the questionnaire should only be completed by the company owner or the director responsible for investments, as it is assumed that these persons are most familiar with the company's activities in Serbia. After the first e-mail with the questionnaire and accompanying material was sent out at the beginning of September, two further requests to complete the questionnaire were sent to respondents four weeks apart, as such an approach can increase the response rate to the survey. After the official closing of the survey, 88 responses were received from FI, which corresponds to a response rate of 29.3%.

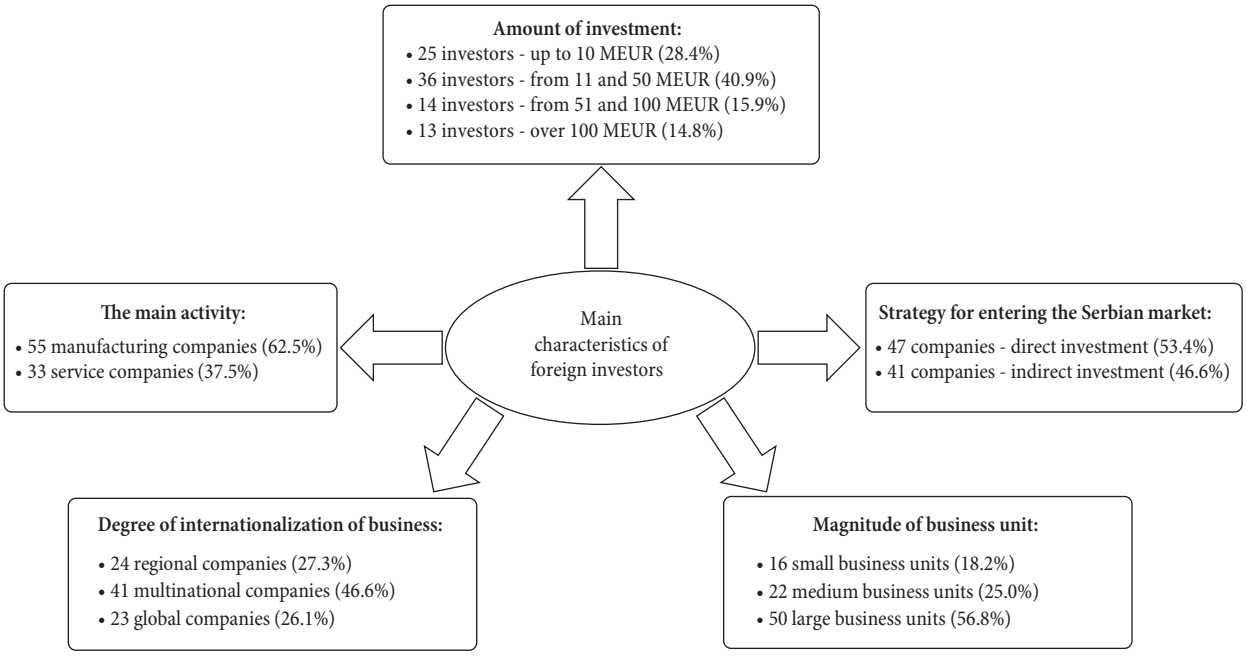
Figure 1 shows the key characteristics of the FI who participated in the survey, with a detailed visualisation through the distribution of frequencies and percentages.

The research approach was based on a *t-test* (comparing the differences between two groups of subjects) and *ANOVA* (comparing the differences between three or more groups of subjects).

Empirical findings

The conducted empirical research focused on analysing the attitudes of FI operating in Serbia regarding the degree of influence of non-fiscal levies and other taxes, i.e. contributions, fees, excises and customs duties, on the tax competitiveness (TC) of Serbia. In other words, the TC of Serbia was analysed by determining the degree

Figure 1: Main characteristics of FI



Source: Authors, based on survey results

of influence of non-fiscal levies and other taxes on the business activities of FI. The results of the study are shown graphically in Figure 2.

Based on the results obtained, it is noticeable that most FI consider the influence of taxes, i.e. levies, fees, excise duties and customs duties, on Serbia's overall TC as neutral. However, when it comes to non-fiscal levies, FI consider their impact on overall TC to be significant. The impact of taxes, i.e. contributions, fees, excise duties and customs duties, as well as non-fiscal levies on Serbia's overall TC in the form of descriptive statistics is presented in Table 1.

The existence of statistically significant differences (S.S.D.) between FI in assessing the impact of non-fiscal levies and other taxes on the TC of Serbia was analysed using ANOVA and t-test. In accordance with the hypotheses, the analysis focused on (a) the activities of FI, (b) the degree of internationalisation of FI business, (c) the way FI enter the Serbian market, (d) the size of FI business unit in Serbia and (e) the amount of FI investments in Serbia.

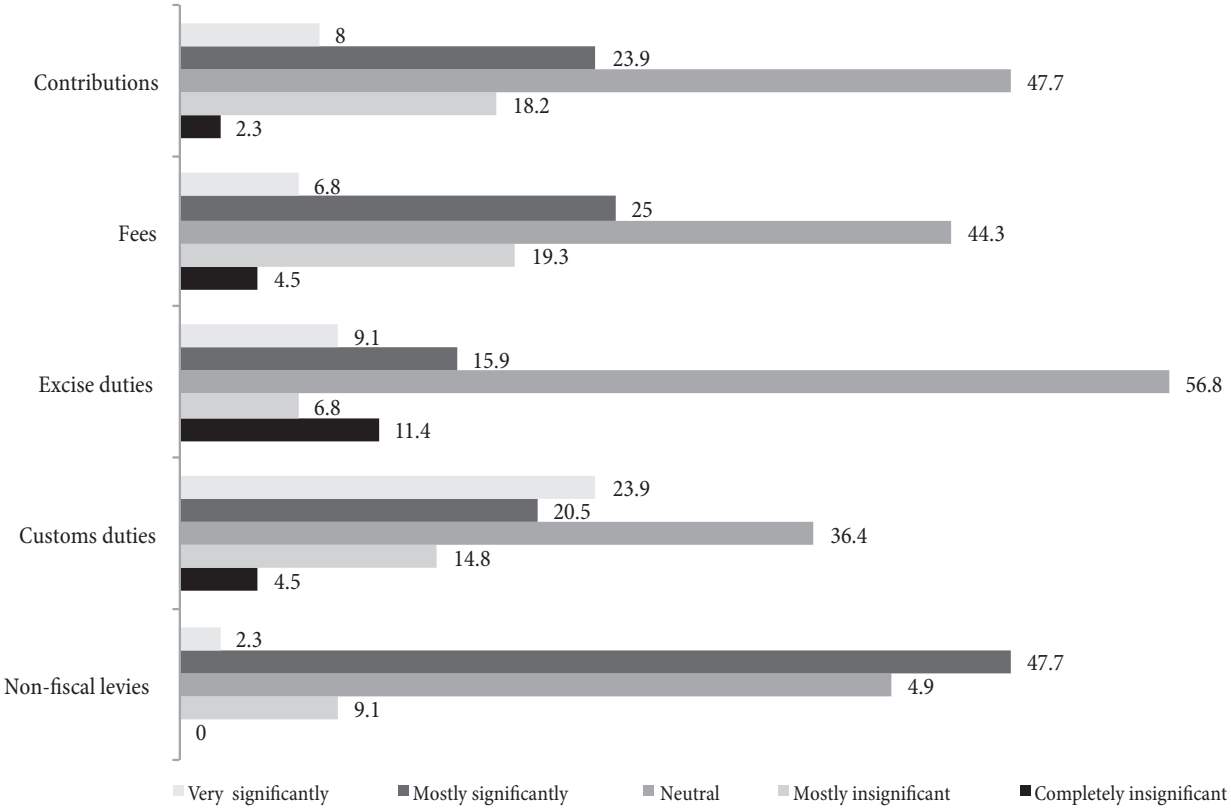
The first part of the analysis aimed to determine whether non-fiscal levies and other taxes, considered according to the activities of FI, affect the TC of Serbia. The results of t-test for the existence of S.S.D. between FI whose main activity is in the manufacturing sector (MS) and those whose main activity is in the service sector (SS) in assessing the influence of non-fiscal levies and other taxes on Serbia's TC are presented in Table 2.

Table 1: Analysis of non-fiscal levies and other taxes - descriptive statistics

	Degree of valuation					M	SD	V
	1	2	3	4	5			
	f (%)	f (%)	f (%)	f (%)	f (%)			
Contributions	2 (2.3)	16 (18.2)	42 (47.7)	21 (23.9)	7 (8.0)	3.1705	0.89983	0.810
Fees	4 (4.5)	17 (19.3)	39 (44.3)	22 (25.0)	6 (6.8)	3.1023	0.94735	0.897
Excise duties	10 (11.4)	6 (6.8)	50 (56.8)	14 (15.9)	8 (9.1)	3.0455	1.02732	1.055
Customs duties	4 (4.5)	13 (14.8)	32 (36.4)	18 (20.5)	21 (23.9)	3.4432	1.14328	1.307
Non-fiscal levies	0 (0)	8 (9.1)	36 (40.9)	42 (47.7)	2 (2.3)	3.4318	0.69142	0.478

Source: Authors' research

Figure 2: The impact of non-fiscal levies and other taxes on Serbia's tax competitiveness



Source: Authors' research

The results of t-test showed that there are no S.S.D. between FI in the assessment of the impact of non-fiscal levies and other taxes on the TC of Serbia, depending on the activity of FI. These S.S.D. were not found, as there was no S.S.D. at the level $p < 0.05$ in the assessment of the influence of non-fiscal levies and other taxes on the TC of Serbia, i.e. contributions, fees, excise duties, customs duties and non-fiscal levies between FI belonging to the group of manufacturing industries on the one hand and FI belonging to the group of service industries on the other.

The second part of the analysis aimed to determine whether non-fiscal levies and other taxes, considered according to the degree of internationalization of the FI company, affect the TC of Serbia. The results of ANOVA on the possible existence of S.S.D. in the assessment of the influence of non-fiscal levies and other taxes on the TC of Serbia depending on the degree of internationalization of FI business are shown in Table 3.

The results of the ANOVA showed the following S.S.D.:

1. When evaluating the impact of contributions on Serbia's TC, $F(2,85) = 6.482$, $p = 0.002$, the magnitude of the discrepancy between distinct groups of FI, expressed by the Eta-squared indicator, is $\eta 2 = 0.132$ and can be considered a large difference. The subsequent comparison by the T-HSD test (Table 4), revealed that the above-mentioned S.S.D. exists between the group of FI belonging to R.C. ($M = 2.6667$, $SD = 0.96309$) on the one hand and those belonging to M.C. ($M = 3.2683$, $SD = 0.70797$) and G.C. ($M = 3.5217$, $SD = 0.94722$) on the other. This means that FI belonging to R.C. rate the impact of contributions on Serbia's TC with a lower average score compared to those belonging to M.C. and G.C.
2. When evaluating the impact of fees on Serbia's TC, $F(2,85) = 3.244$, $p = 0.044$, the magnitude of the discrepancy between distinct groups of FI, expressed by the Eta-squared indicator, is $\eta 2 = 0.070$ and can be considered a mean difference.

Table 3: Importance of non-fiscal levies and other taxes (depending on the degree of internationalization of business activities)

		M (SD)	95% CIM		F	p*
			Lower	Upper		
Contributions	R.C. N = 24	2.6667 (0.96309)	2.2600	3.0733	6.482	0.002
	M.C. N = 41	3.2683 (0.70797)	3.0448	3.4918		
	G.C. N = 23	3.5217 (0.94722)	3.1121	3.9313		
Fees	R.C. N = 24	2.7500 (1.18872)	2.2480	3.2520	3.244	0.044
	M.C. N = 41	3.1220 (0.87164)	2.8468	3.3971		
	G.C. N=23	3.4348 (0.66237)	3.1484	3.7212		
Excise duties	R.C. N = 24	2.1667 (1.00722)	1.7414	2.5920	16.442	0.000
	M.C. N = 41	3.3415 (0.91131)	2.5920	3.6291		
	G.C. N = 23	3.4348 (0.66237)	3.1484	3.7212		
Customs duties	R.C. N =24	2.5833 (1.21285)	2.0712	3.0955	11.845	0.000
	M.C. N = 41	3.7073 (0.98092)	3.3977	4.0169		
	G.C. N = 23	3.8696 (0.86887)	3.4938	4.2453		
Non-fiscal levies	R.C. N=24	3.2500 (0.73721)	2.9387	3.5613	5.687	0.005
	M.C. N = 41	3.6829 (0.56741)	3.5038	3.8620		
	G.C. N = 23	3.1739 (0.71682)	2.8639	3.4839		

* At the level $p < 0.05$, a S.S.D. is present
Note: R.C. (regional companies); M.C. (multinational companies); G.C. (global companies)
Source: Authors' research

Table 2: Importance of non-fiscal levies and other taxes (by activity of FI)

	M (SD)		MD	95% CID		t	p*
	MS, N = 55	SS, N = 33		Lower	Upper		
Contributions	3.0909 (0.77633)	3.3030 (1.07485)	-0.21212	-0.64232	0.21808	-0.989	0.327
Fees	3.1636 (1.04993)	3.0000 (0.75000)	0.16364	-0.25197	0.57924	0.783	0.436
Excise duties	3.1636 (1.11826)	2.8485 (0.83371)	0.31515	-.013207	0.76237	1.401	0.165
Customs duties	3.6000 (1.06458)	3.1818 (1.23629)	0.41818	-0.07712	0.91348	1.678	0.097
Non-fiscal levies	3.4182 (0.73764)	3.4545 (0.61699)	-0.03636	-0.34067	0.26794	-0.238	0.813

* At the level $p < 0.05$, a S.S.D. is present
Note: MS (manufacturing sector); SS (service sector)
Source: Authors' research

The subsequent comparison by the T-HSD test (Table 5), revealed that the above-mentioned S.S.D. exists between the group of FI belonging to R.C. (M = 2.7500, SD = 1.18872) on the one hand and the group belonging to G.C. (M = 3.4348, SD = 0.66237), on the other.

The results obtained show that FI belonging to R.C. rate the impact of the fees on Serbia's TC with a lower average score compared to those belonging to M.C. and G.C.

3. When evaluating the impact of excise duties on Serbia's TC, F(2,85) = 16.442, p = 0.000, the magnitude of the discrepancy between distinct groups of FI, expressed by the Eta-squared indicator, is η2 = 0.279 and can be considered a large difference. The subsequent comparison by the T-HSD test (Table 6), revealed that the above-mentioned S.S.D. exists between the group of FI belonging to R.C. (M = 2.1667, SD = 1.00722) on the one hand and the group belonging to M.C. (M = 3.3415, SD = 0.91131) and G.C. (M = 3.4348, SD = 0.66237), on the other.

The results of the research show that FI belonging to R.C. rate the impact of excise taxes on Serbia's TC with a lower average score than those belonging to M.C. and G.C.

4. When evaluating the impact of customs duties on Serbia's TC, F(2,85) = 11.845, p = 0.000, the magnitude of the discrepancy between distinct groups of FI, expressed by the Eta-squared indicator, is η2 = 0.218 and can be considered a large difference. The subsequent comparison by the T-HSD test (Table 7), revealed that the above-mentioned S.S.D. exists between the group of FI belonging to R.C. (M = 2.5833, SD = 1.21285) on the one hand and those belonging to M.C. (M = 3.7073, SD = 0.98092) and G.C. (M = 3.8696, SD = 0.86887), on the other.

FI belonging to R.C. rated the impact of tariffs on Serbia's TC with a lower average score compared to those belonging to M.C. and G.C.

Table 4: Results of the T-HSD test on the differences between FI depending on the degree of internationalisation of the company when assessing the impact of contributions on the TC of Serbia

	(I)	(J)	MD (I-J)	p*	95% CIM Lower	95% CIM Upper
Contributions	R.C.	M.C.	-0.60163	0.019	-1.1215	-0.0817
		G.C.	-0.85507	0.002	-1.4453	-0.2648
	M.C.	R.C.	0.60163	0.019	0.0817	1.1215
		G.C.	-0.25345	0.488	-0.7804	0.2735
	G.C.	R.C.	0.85507	0.002	0.2648	1.4453
		M.C.	0.25345	0.488	-0.2735	0.7804

* At the level p < 0.05, a S.S.D. is present
Source: Authors' research

Table 5: Results of the T-HSD test on the differences between FI depending on the degree of internationalization of business activities when assessing the impact of fees on the TC of Serbia

	(I)	(J)	MD (I-J)	p*	95% CIM Lower	95% CIM Upper
Fees	R.C.	M.C.	-0.37195	0.266	-0.9383	0.1944
		G.C.	-0.68478	0.034	-1.3278	-0.0417
	M.C.	R.C.	0.37195	0.266	-0.1944	0.9383
		G.C.	-0.31283	0.399	-0.8869	0.2613
	G.C.	R.C.	0.68478	0.034	0.0417	1.3278
		M.C.	0.31283	0.399	-0.2613	0.8869

* At the level p < 0.05, a S.S.D. is present
Source: Authors' research

Table 6: Results of the T-HSD test on the differences between FI depending on the degree of internationalisation of business activities when assessing the impact of excise taxes on the TC of Serbia

	(I)	(J)	MD (I-J)	p*	95% CIM Lower	95% CIM Upper
Excise duties	R.C.	M.C.	-1.17480	0.000	-1.7159	-0.6337
		G.C.	-1.26812	0.000	-1.8824	-0.6538
	M.C.	R.C.	1.17480	0.000	0.6337	1.7159
		G.C.	-0.09332	0.913	-0.6418	0.4551
	G.C.	R.C.	1.26812	0.000	0.6538	1.8824
		M.C.	0.09332	0.913	-0.4551	0.6418

* At the level p < 0.05, a S.S.D. is present
Source: Authors' research

Table 7: Results of the T-HSD test on the differences between FI depending on the degree of internationalisation of the company when assessing the impact of tariffs on the TC of Serbia

	(I)	(J)	*MD* (I-J)	p*	95% CIM Lower	95% CIM Upper
Customs duties	R.C.	M.C.	-1.12398	0.000	-1.7511	-0.4969
		G.C.	-1.28623	0.000	-1.9982	-0.5743
	M.C.	R.C.	1.12398	0.000	0.4969	1.7511
		G.C.	-0.16225	0.816	-0.7979	0.4734
	G.C.	R.C.	1.28623	0.000	0.5743	1.9982
		M.C.	0.16225	0.816	-0.4734	0.7979

* At the level p < 0.05, a S.S.D. is present
Source: Authors' research

5. When evaluating the impact of non-fiscal levies on Serbia's TC, $F(2,85) = 5.687$, $p = 0.005$, the magnitude of the discrepancy between distinct groups of FI, expressed by the Eta-squared indicator, is $\eta 2 = 0.118$ and can be considered a large difference. The subsequent comparison by the T-HSD test (Table 8), revealed that the above-mentioned S.S.D. exists between the group of FI belonging to M.C. (M=3.6829, SD=0.56741) on the one hand and those belonging to R.C: (M = 3.2500, SD = 0.73721) and G.C. (M=3.1739, SD=0.71682), on the other.

This means that FI belonging to M.C. give a lower average score to the impact of non-fiscal levies on Serbia's TC compared to those belonging to R.C. and G.C.

The third part of the analysis aimed to determine whether non-fiscal levies and other taxes, considered according to the way a FI enters the Serbian market, affect the TC of Serbia. The results of the independent samples t-test for the existence of S.S.D. in the assessment of the influence of non-fiscal levies and other taxes on the TC of Serbia between FI who entered the Serbian market through direct investment (D.I.) or indirect investment (I.I.) are presented in Table 9.

Table 8: Results of the T-HSD test on the differences between FI depending on the degree of internationalisation of business activities when assessing the impact of non-fiscal levies on the TC of Serbia

	(I)	(J)	MD (I-J)	p*	95% CIM Lower	95% CIM Upper
Non-fiscal levies	R.C.	M.C.	-0.43293	0.032	-0.8357	-0.0302
		G.C.	0.07609	0.917	-0.3812	0.5334
	M.C.	R.C.	0.43293	0.011	0.0302	0.8357
		G.C.	0.50901	0.488	0.1008	0.9173
	G.C.	R.C.	-0.07609	0.917	-0.5334	0.3812
		M.C.	-0.50901	0.011	-0.9173	-0.1008

* At the level $p < 0.05$, a S.S.D. is present
Source: Authors' research

However, the results of the t-test showed that, depending on the way FI entered the Serbian market, there are no S.S.D. between them in terms of evaluating the degree of influence of non-fiscal levies and other taxes on Serbia's TC. These S.S.D. were not found, because there was no S.S.D. at the $p < 0.05$ level in assessing the degree of influence of non-fiscal levies and other taxes on Serbia's TC, i.e. contributions, fees, excise duties, customs duties and non-fiscal levies between FI who entered the Serbian market through D.I., on the one hand, and FI who entered the Serbian market through I.I., on the other hand.

The fourth part of the analysis aimed to determine whether non-fiscal levies and other taxes, viewed according to the size of the FI business unit in Serbia, affect Serbia's TC. The results of the ANOVA on the possible existence of S.S.D. in assessing the degree of influence of non-fiscal levies and other taxes on Serbia's TC and depending on the size of the business unit of FI in Serbia, are shown in Table 10.

The results of ANOVA showed the existence of a S.S.D. in the assessment of the impact of contributions on the TC of Serbia, $F(2,85) = 4.483$, $p = 0.014$, the magnitude of the discrepancy between distinct groups of FI, expressed by the Eta-squared indicator, is $\eta 2 = 0.095$ and can be considered a difference of medium size. The subsequent

Table 9: Importance of non-fiscal levies and other taxes (according to the type of entry of FI into the Serbian market)

	M (SD) D.I. N = 47	M (SD) I.I. N = 41	MD	95% CID Lower	95% CID Upper	t	p*
Contributions	3.1064 (0.72932)	3.2439 (1.06725)	-0.13752	-0.53196	0.25692	-0.695	0.489
Fees	3.1915 (1.03500)	3.0000 (0.83666)	0.19149	-0.21121	0.59419	0.945	0.347
Excise duties	3.1702 (1.04921)	2.9024 (0.99511)	0.26777	-0.16741	0.70296	1.223	0.225
Customs duties	3.5319 (1.01833)	3.3415 (1.27691)	0.19045	-0.29634	0.67724	0.778	0.439
Non-fiscal levies	3.5319 (0.71782)	3.3171 (0.64958)	0.21484	-0.07698	0.50666	1.464	0.147

* At the level $p < 0.05$, a S.S.D. is present
Note: D.I. (direct investment); I.I. (indirect investment)
Source: Authors' research

comparison by the T-HSD test (Table 11), showed that the above-mentioned S.S.D. exists between the group of FI whose business unit in Serbia is a S.B.E. (M = 3.6875, SD = 0.79320) and the group whose business unit in Serbia is a L.B.E. (M = 2.9600, SD = 0.87970).

This means that FI whose business unit in Serbia is a S.B.E. assess the degree of impact of contributions on Serbia's TC higher than FI whose business entity in Serbia is a L.B.E.

The fifth part of the analysis aimed to determine whether non-fiscal levies and other taxes, considered according to

Table 10: Significance of non-fiscal levies and other taxes (according to the size of the FI business unit in Serbia)

		M (SD)	95% CIM Lower	95% CIM Upper	F	p*
Contributions	S.B.E. N = 16	3.6875 (0.79320)	3.2648	4.1102	4.483	0.014
	M.B.E. N = 22	3.2727 (0.88273)	2.8813	3.6641		
	L.B.E. N = 50	2.9600 (0.87970)	2.7100	3.2100		
Fees	S.B.E. N = 16	3.0625 (0.99791)	2.5307	3.5943	0.472	0.625
	M.B.E. N = 22	3.2727 (0.88273)	2.8813	3.6641		
	L.B.E. N = 50	3.0400 (0.96806)	2.7649	3.3151		
Excise duties	S.B.E. N = 16	3.2500 (0.44721)	3.0117	3.4883	1.522	0.224
	M.B.E. N = 22	3.2727 (1.31590)	2.6893	3.8562		
	L.B.E. N = 50	2.8800 (1.00285)	2.5950	3.1650		
Customs duties	S.B.E. N = 16	3.8125 (1.22304)	3.1608	4.4642	1.447	0.241
	M.B.E. N = 22	3.5455 (0.91168)	3.1412	3.9497		
	L.B.E. N = 50	3.2800 (1.19591)	2.9401	3.6199		
Non-fiscal levies	S.B.E. N = 16	3.5000 (0.51640)	3.2248	3.7752	0.639	0.530
	M.B.E. N = 22	3.5455 (0.80043)	3.1906	3.9003		
	L.B.E. N = 50	3.3600 (0.69282)	3.1631	3.5569		

* At the level p < 0.05, a S.S.D. is present
Note: S.B.E. (small business entity); M.B.E. (medium business entity); L.B.E. (large business entity)
Source: Authors' research

Table 11: Results of the T-HSD test on the differences between FI depending on the size of the business unit in Serbia in the assessment of the degree of impact of contributions on the TC of Serbia

	(I)	(J)	MD (I-J)	p*	95% CIM Lower	95% CIM Upper
Contributions	S.B.E.	M.B.E.	0.41477	0.316	-0.2638	1.0934
		L.B.E.	0.72750	0.012	0.1343	1.3207
	M.B.E.	S.B.E.	-0.41477	0.316	-1.0934	0.2638
		L.B.E.	0.31273	0.339	-0.2157	0.8411
	L.B.E.	S.B.E.	-0.72750	0.012	-1.3207	-0.1343
		M.B.E	-0.31273	0.339	-0.8411	0.2157

* At the level p < 0.05, a S.S.D. is present
Source: Authors' research

Table 12: Significance of non-fiscal levies and other taxes (according to the level of investment by FI in Serbia)

		M (SD)	95% CIM Lower	95% CIM Upper	F	p*
Contributions	Less than 10 MEUR, N = 25	3.2800 (0.84261)	2.9322	3.6278	0.389	0.761
	From 11 to 50 MEUR, N = 36	3.0556 (0.79082)	2.7880	3.3231		
	From 51 to 100 MEUR, N = 14	3.2857 (1.06904)	2.6685	3.9030		
	Over 100 MEUR, N = 13	3.1538 (1.14354)	2.4628	3.8449		
Fees	Less than 10 MEUR, N = 25	3.2800 (1.13725)	2.8106	3.7494	1.341	0.267
	From 11 to 50 MEUR, N = 36	2.8611 (0.86694)	2.5678	3.1544		
	From 51 to 100 MEUR, N = 14	3.2857 (0.72627)	2.8664	3.7051		
	Over 100 MEUR, N = 13	3.2308 (0.92681)	2.6707	3.7908		
Excise duties	Less than 10 MEUR, N = 25	3.1600 (1.21381)	2.6590	3.6610	0.454	0.715
	From 11 to 50 MEUR, N = 36	3.0278 (0.90982)	2.7199	3.3356		
	From 51 to 100 MEUR, N = 14	3.1429 (1.02711)	2.5498	3.7359		
	Over 100 MEUR, N = 13	2.7692 (1.01274)	2.1572	3.3812		
Customs duties	Less than 10 MEUR, N = 25	3.6800 (1.21518)	3.1784	4.1816	0.511	0.676
	From 11 to 50 MEUR, N = 36	3.3611 (0.99003)	3.0261	3.6961		
	From 51 to 100 MEUR, N = 14	3.2857 (1.06904)	2.6685	3.9030		
	Over 100 MEUR, N = 13	3.3846 (1.50214)	2.4769	4.2923		
Non-fiscal levies	Less than 10 MEUR, N = 25	3.4800 (0.65320)	3.2104	3.7496	2.330	0.080
	From 11 to 50 MEUR, N = 36	3.2222 (0.72155)	2.9781	3.4664		
	From 51 to 100 MEUR, N = 14	3.7143 (0.72627)	3.2949	4.1336		
	Over 100 MEUR, N = 13	3.6154 (0.50637)	3.3094	3.9214		

* At the level p < 0.05, a S.S.D. is present
Source: Authors' research

the size of FI investment in Serbia, affect Serbia's TC. The results of ANOVA on the possible existence of S.S.D. in the assessment of the impact of non-tax levies and other taxes on the TC of Serbia and depending on the amount of investment made in Serbia are presented in Table 12.

However, the results of ANOVA show that there are no S.S.D. between FI in Serbia, depending on their level of investment, when it comes to assessing the influence of non-fiscal levies and other taxes on Serbia's TC.

These S.S.D. were not found, as there was no S.S.D. at the $p < 0.05$ level in the assessment of the influence of non-tax levies and other taxes on the TC of Serbia, i.e. the difference in the impact of taxes, fees, excise duties, customs duties and non-fiscal taxes between the group of FI who invested up to 10 MEUR in Serbia and groups of FI who invested between 11 and 50 MEUR in Serbia, on the one hand, groups of FI who invested between 11 and 50 MEUR in Serbia and groups of FI who invested between 51 and 100 MEUR in Serbia, on the other hand, on the other side, a group of FI who have invested between 51 and 100 MEUR in Serbia and a group of FI who have invested over 100 MEUR in Serbia on the third side, and a group of FI who have invested up to 10 MEUR in Serbia and a group of FI who have invested over 100 MEUR in Serbia on the fourth side.

Conclusions

Tax competitiveness refers to a country's ability to attract and retain FDI through favourable and competitive tax policies. It shapes investor perceptions, influences decision-making processes and contributes to a country's overall economic development. Policy makers must carefully review and adjust tax policies to maintain competitiveness in the global marketplace and capitalise on FDI opportunities. Countries that manage FDI effectively generally see improvements in a variety of economic competitiveness indicators, contributing to long-term economic growth and development.

The goal of every country is to create a favourable environment for investors, which is reflected in the fact that it offers better business conditions than competing countries. All developing countries, including Serbia, consider FDI as an important source of economic development. Therefore, it is very important for Serbia to succeed in attracting a significant amount of FDI every year, which contributes to the economic growth and development of the country. In this regard, Serbia has received more than 4 billion dollars in FDI every year for the last five years. This clearly indicates that the state expects FDI to exceed 5 billion dollars in the next period.

The relationship between non-fiscal levies and FDI is a key factor in creating a favourable and competitive investment environment. Countries that manage non-fiscal costs effectively, ensuring transparency, efficiency and alignment with global standards, are more likely to attract and retain FDI. Beyond taxes, policymakers should also consider the broader regulatory landscape to create a business-friendly climate that promotes sustainable economic development. The impact of duties, tariffs, fees, and excise taxes on FDI is complex and affects a country's cost structure, competitiveness and overall attractiveness as an investment location. Policy makers must carefully consider the impact of these financial obligations in order to create a business-friendly environment that favours both domestic and FDI.

The main goal of this research was to determine whether non-fiscal levies and other taxes (customs duties, excise duties, contributions, and fees) affect Serbia's TC, based on primary data obtained through the use of the survey technique (by e-mail). That is, to what extent are non-fiscal levies and other taxes important for FI when deciding whether to invest capital in Serbia or to continue their investments if the investor is already operating in Serbia. Regarding the impact of non-fiscal levies and other taxes on Serbia's TC, the largest number of FI believe that the impact of taxes, i.e. contributions, fees, excises, and levies, on Serbia's overall TC is neutral. However, when it comes to non-tax levies, their impact on overall TC is considered significant by the largest number of FI, especially from the group of global and multinational companies.

The findings of this study reveal several crucial facts:

1. No S.S.D. were found in the assessment of the impact of non-fiscal levies and other taxes on Serbia's TC between FI operating in the manufacturing sector and FI operating in the services sector.

2. FI belonging to the group of M.C. and G.C. assessed the impact of contributions, fees, excise duties and customs duties on the TC of Serbia as more significant than the opinion of FI belonging to the group of R.C. On the other hand, FI belonging to the group of R.C. and G.C. estimated that the impact of non-tax levies on the TC of Serbia is more significant than the opinion of FI belonging to the group of M.C.
3. No S.S.D. were found between FI depending on the way they entered the Serbian market, which clearly indicates that non-fiscal levies and other taxes are not of crucial importance for a FI, regardless of whether it is an indirect or direct investment.
4. Investors categorised as small companies believe that the impact of taxes on Serbia's TC is more significant than investors categorised as large companies.
5. The impact of non-fiscal levies and other taxes on TC was not determined when considered according to the size of a FI investment in Serbia, regardless of whether the investment is up to 10 MEUR, between 11 and 50 MEUR, between 51 and 100 MEUR and over 100 MEUR.

A competitive tax system can attract business, encourage investment and stimulate economic growth. By focussing on these criteria and consistently refining its tax policy, Serbia can promote business growth, attract international investment and support long-term economic development. The designers of future reforms of the Serbian tax system should pay special attention to the reduction of non-tax levies and create opportunities to do so, as this research has shown that most FI consider their impact on overall TC to be very significant, especially those FI belonging to G.C. and M.C. In this way, the Serbian economy can become even more competitive, which will create the conditions for Serbia to be a very attractive investment destination in the future.

Acknowledgment

The research presented in this paper was funded by the Ministry of Science, Technological Development, and Innovation of the Republic of Serbia under contract number 451-03-47/2023-01/200005.

References

1. Azémar, C., & Dharmapala, D. (2019). Tax sparing agreements, territorial tax reforms, and foreign direct investment. *Journal of public economics*, *169*, 89-108.
2. Bayar, Y., & Ozturk, O.F. (2018). Impact of foreign direct investment inflows on tax revenues in OECD countries: A panel co-integration and causality analysis. *Theoretical & Applied Economics*, *25*(1), 31-40.
3. Bermejo Carbonell, J., & Werner, R.A. (2018). Does foreign direct investment generate economic growth? A new empirical approach applied to Spain. *Economic geography*, *94*(4), 425-456.
4. Camara, A. (2023). The effect of foreign direct investment on tax revenue. *Comparative Economic Studies*, *65*(1), 168-190.
5. Cicea, C., & Marinescu, C. (2021). Bibliometric analysis of foreign direct investment and economic growth relationship. A research agenda. *Journal of Business Economics and Management*, *22*(2), 445-466.
6. Dang, V.C., & Nguyen, Q.K. (2021). Determinants of FDI attractiveness: Evidence from ASEAN-7 countries. *Cogent Social Sciences*, *7*(1).
7. Domazet, I., Marjanović, D., Ahmetagić, D., Bugarčić, M., & Simović, V. (2024). Business Sector Investment in R&D as a Factor for Improving Innovation-Evidence from Hungary, Romania, Bulgaria, and Serbia. *Eastern European Economics*, *62*(1), 50-68.
8. Domazet, I., Marjanović, D., & Ahmetagić, D. (2022). The Impact of High-Tech Products Exports on Economic Growth: The Case of Serbia, Bulgaria, Romania and Hungary. *Ekonomika preduzeća*, *70*(3-4), 191-205.
9. Domazet, I., Marjanović, D., Ahmetagić, D., & Bugarčić, M. (2021). The Impact of Innovation Indicators on Increasing Exports of High Technology Products. *Ekonomika preduzeća*, *69*(1-2), 31-40.
10. Đuričin, D., Vuksanović Herceg, I., Kuč. V. (2023). How a structural crisis is flipping the economic script and calling for the green transition in Serbia. *Ekonomika preduzeća, 71*(1-2), 1-29.
11. Đuričin, D., & Vuksanović Herceg, I. (2022). Envisioning a new economic system after the transition from pandemic to endemic: Serbia's perspective. *Ekonomika preduzeća, 70*(1-2), 1-22.
12. Đuričin, D., & Lončar, D. (2020). Shaping the future of Serbia's economy: the new growth model and related economic policy platform. *Ekonomika preduzeća, 68*(1-2), 1-21.
13. Egger, P., & Raff, H. (2015). Tax rate and tax base competition for foreign direct investment. *International tax and public finance*, *22*, 777-810.
14. Galgánková, V. (2020). Competitiveness of V4 Countries Using the Global Competitiveness Index. In *SHS Web of Conferences*. EDP Sciences.
15. Han, W., Wang, J., & Wang, X. (2022). FDI and firm productivity in host countries: The role of financial constraints. *Journal of International Money and Finance*, *124*.
16. Horobet, A., Popovici, O.C., & Belaşcu, L. (2021). Shaping competitiveness for driving FDI in CEE countries. *Romanian Journal of European Affairs*, *21*(2), 48-68.

17. Jovanović, M., Domazet, I., & Marjanović, D. (2023). *Quality of Government as an Attracting Factor of FDI - Evidence from Chosen Southeastern European Countries*. *Economic Analysis*, *56*(2), 1-18.
18. Kumari, R., & Sharma, A.K. (2017). Determinants of foreign direct investment in developing countries: a panel data study. *International Journal of Emerging Markets*, *12*(4), 658-682.
19. Marjanović, D., Domazet, I., & Vukmirović, I. (2022). Social Environment as a Factor of Capital Investment in Serbia. *Eastern European Economics*, *60 (3),* 247-264.
20. Marjanović, D., Beraha, I., & Domazet, I. (2022). Belt and Road Initiative as a Development Chance for the Western Balkan Countries: The Case of Serbia. In Bhuiyan, M.A. & Beraha, I. (Eds) *Opportunities and challenges for multinational enterprises and foreign direct investment in the belt and road initiative*, 172-193. Hershey: IGI Global.
21. Marjanović, D., & Domazet, I. (2021). Tax competitiveness as a significant factor in attracting foreign investment – the case of Serbia. *Argumenta oeconomica*, *2*(47), 63-80.
22. Marjanović, D., & Domazet, I. (2021). Foreign Direct Investments: A Key Factor for Business Globalization. In Bayar, Y. (Eds), *Institutional, Economic, and Social Impacts of Globalization and Liberalization,* 96-116. Hershey: IGI Global.
23. Marjanović, D., & Domazet, I. (2018). *Unapređenje makro konkurentnosti: fiskalni aspekti*. Beograd: Institut ekonomskih nauka.
24. Munongo, S., Akanbi, O.A., & Robinson, Z. (2017). Do tax incentives matter for investment? A literature review. *Business and Economic Horizons*, *13*(2), 152-168.
25. Montmartin, B., & Herrera, M. (2015). Internal and external effects of R&D subsidies and fiscal incentives: Empirical evidence using spatial dynamic panel models. *Research policy*, *44*(5), 1065-1079.
26. Pankova, V.A., & Pekhalskiy, D.I. (2023). Technological proximity of countries as a factor of inward foreign direct investment to developing economies. *Voprosy Ekonomiki*, *12*, 66-85.
27. Pekarskiene, I., & Susniene, R. (2015). Features of foreign direct investment in the context of globalization. *Procedia-Social and Behavioral Sciences*, *213*, 204-210.
28. Podviezko, A., Parfenova, L., & Pugachev, A. (2019). Tax competitiveness of the new EU member states. *Journal of Risk and Financial Management*, *12*(1), 34.
29. Tian, Y. (2018). Optimal policy for attracting FDI: Investment cost subsidy versus tax rate reduction. *International Review of Economics & Finance*, *53*, 151-159.
30. Wang, X., Xu, Z., Qin, Y., & Skare, M. (2022). Foreign direct investment and economic growth: a dynamic study of measurement approaches and results. *Economic research, 35*(1), 1011-1034.
31. Zagler, M. (2023). Foreign direct investment, legal uncertainty and corporate income taxation. *International Economics*, *173*, 19-28.

Ivana Domazet

is a principal research fellow at the Institute of Economic Sciences and a professor at the Faculty for Banking, Insurance and Finance at Union University. She teaches Marketing Management, Digital Marketing and Integrated Communications (postgraduate studies). Her scientific interests include competitiveness, market research, innovation, and digital economy. She published three scientific monographs in the competitiveness and integrated marketing communications field. Also, she published more than 100 scientific papers in journals, thematic publications, conference proceedings, and national and international monographs as an author and/or co-author. She is vice president of the National Scientific Committee for Law, Economics and Political Sciences of the Republic of Serbia; vice president and board member of the Institute of Economics Sciences; board member of the Institute of Social Sciences; member of the Scientific Society of Economists in Serbia and member of the Serbian Marketing Association

Darko Marjanović

is a senior research associate at the Institute of Economic Sciences. He completed his graduate, master, and doctoral studies at the Faculty of Economics in Subotica, University of Novi Sad. He served as a financial director (CFO) in a large trading company BB Trade ad from 2015 to 2018. His current areas of professional interest are public finance, competitiveness, and foreign direct investment. He has published, as author or co-author, more than 60 scientific papers. He has participated in a few international projects, as well as several research and scientific projects, financed by the Ministry of Education, Science, and Technological Development of the Republic of Serbia and Provincial Secretariat for Science and Technological Development of the Autonomous Province of Vojvodina. He is vice president of the Scientific Board at the Institute of Economic Sciences and an associate member of the Scientific Society of Economists of Serbia.

ORIGINAL SCIENTIFIC PAPER
UDK: 658.8:004.738.5
659.122:366.1
DOI: 10.5937/EKOPRE2404204T
Date of Receipt: July 21, 2023

Slaviša Trajković
University of Priština
in Kosovska Mitrovica
Faculty of Economics

Srđan Milosavljević
University of Priština
in Kosovska Mitrovica
Faculty of Economics

Ivana Aleksić
University of Priština
in Kosovska Mitrovica
Faculty of Economics

THE ROLE AND IMPORTANCE OF DIGITAL MARKETING TECHNIQUES IN CREATING USER EXPERIENCE AND CUSTOMER ENGAGEMENT IN THE PROCESS OF JOINT CREATION (CO-CREATION)

Uloga i značaj tehnika digitalnog marketinga u kreiranju korisničkog iskustva i angažovanju kupaca u procesu zajedničkog stvaranja (ko-kreiranja)

Abstract

Modern business conditions, characterized by the accelerated development of technique and technology, resulted from the globalization process, have completely changed the environment in which companies operate. The era of the Internet is characterized, on the one hand, by new business models, which have conditioned the digitization of business and especially marketing, and, on the other hand, consumers who are "loud and active", save their time, want quick feedback, individual offers and, consequently, participation in product design or service. In this regard, the subject of research in this paper involves correlational tests, on the one hand of respondents' attitudes towards digital marketing techniques and, on the other, their willingness to accept promotional content on the Internet, make a purchase decision, access electronic transactions and participate in interaction with company. The aim of the research is to analyze the contribution of digital marketing techniques in the creation of user experience and customer engagement in the process of joint creation (co-creation). A total of 335 respondents participated in the research conducted through a survey method. The results of the research show that the marketing content that companies place through digital marketing techniques influences consumers' decision to buy a certain product, while the quality and the way the marketing content is placed affect their loyalty. Also, user experience and customers' willingness to participate in different segments of co-creation are conditioned by the application of the mentioned techniques, as well as by interaction with the company through which customers can share their opinion and creativity, but also express their needs and wishes regarding the characteristics of products and services, which represents a way of personalizing the company's offer. The potential for business improvement through the application of digital marketing techniques is great, that's why investments in the aforementioned techniques represent an investment, not an expense.

Keywords: *digital marketing techniques, user experience, co-creation, social media, email, mobile marketing, website, search engine advertising*

Sažetak

Savremeni uslovi poslovanja koje karakteriše ubrzani razvoj tehnike i tehnologije, nastao kao posledica procesa globalizacije, u potpunosti menjaju okruženje u kojem preduzeća funkcionišu. Eru Interneta karakterišu, s jedne strane novi poslovni modeli, koji su uslovili digitalizaciju poslovanja i posebno marketinga i, s druge strane, potrošači koji su „glasni i aktivni", štede svoje vreme, žele brzu povratnu informaciju, individualnu ponudu i posledično učešće u dizajniranju proizvoda ili usluga. S tim u vezi, predmet istraživanja u ovom radu su korelaciona ispitivanja, s jedne strane stavova ispitanika o tehnikama digitalnog marketinga i s druge strane, njihove spremnosti da prihvate promotivni sadržaj na Internetu, donesu odluku o kupovini, pristupe elektronskim transakcijama i učestvuju u interakciji sa kompanijom. Cilj istraživanja je analiza doprinosa tehnika digitalnog marketinga u kreiranju korisničkog iskustva i angažovanju kupaca u procesu zajedničkog stvaranja (ko-kreiranja). U istraživanju sprovedenom kroz metod anketiranja učestvovalo je ukupno 335 ispitanika. Rezultati istraživanja pokazuju da na odluku potrošača o kupovini određenog proizvoda utiče marketing sadržaj koji kompanije plasiraju putem tehnika digitalnog marketinga, dok kvalitet ali i način plasiranja marketing sadržaja utiču na njihovu lojalnost. Takođe, korisničko iskustvo i spremnost kupaca da učestvuju u različitim segmentima zajedničkog stvaranja uslovljeni su primenom navedenih tehnika, ali i interakcijom sa kompanijom kroz koju kupci mogu da podele svoje mišljenje i kreativnost ali i izraze svoje potrebe i želje u pogledu karakteristika proizvoda i usluga, što predstavlja put personalizacije ponude preduzeća. Potencijal unapređenja poslovanja kroz primenu tehnika digitalnog marketinga je veliki, zato ulaganja u pomenute tehnike predstavljaju investiciju, a ne trošak.

Ključne reči: *tehnike digitalnog marketinga, korisničko iskustvo, ko-kreiranje, društvene mreže, elektronska pošta, mobilni marketing, veb-sajt, oglašavanje na pretraživačima*

Introduction

Facing an extremely unstable, competitive and unpredictable environment, companies are forced to adapt to existing and to develop new strategies based on the digitization of their activities. The use of modern information and communication technologies is one of the key factors in achieving competitiveness, productivity and business efficiency [8, p. 43]. Given that the digital transformation has caused a gradual but almost complete change in traditional patterns of production, decision-making, communication, promotion, distribution, purchasing, designing and product development, the importance of digital technology that is talked about every day and which is, increasingly, the subject of numerous researches and analysis, involving scientists from different fields is completely justified.

It is a real challenge to find a way to integrate digital marketing into the strategic marketing function and towards business goals in the time of fast development of new technologies and the tendency of today's customers towards digital sales channels and media [17, p. 306]. Particularly relevant in the last two decades, the digitalization of marketing has created a new business horizon in which two-way communication and promotion through the Internet, replacing going to the store with sit-back shopping, meeting the growing needs for personalization of the product and service offers, intensive involvement of customers in the process of co-creation, as well as the characteristics of digital marketing, represent the foundation of the survival and development of a company. In the sphere of electronic business, digital marketing has become so important that modern business cannot be imagined without it and therefore the possibilities of applying digital marketing do not depend on the size of the company, so even small and medium-sized companies have the obligation to keep up with trends, acquire digital literacy and develop effective digital marketing strategies [28].

Given the fact that active and "loud" consumers are increasingly present today and they communicate daily with companies whose products they are buying and using and who want to participate in product design, and on the other hand companies, through the use of the Internet and digital technologies, strive to find consumers on the right place, at the right time and with the right message, the subject of research in this paper is the role and importance of digital marketing techniques in attracting new and retaining existing customers, creating user experience and engaging consumers in the co-creation process. Given that digital marketing occurs due to technological changes and the influence of technological changes on consumers [28, p. 2], the motive of the research is of a dual nature and stems from the mutual connection and conditioning of two extremely current processes, on the one hand digitalization and, on the other, the marketing function, profiled as one of the most important business functions in the company.

Literature review

We live in a time where power is being redirected from the organization to the consumer, who plays an increasingly important role, who is active, engaged and has control over communications, while on the other hand, it is increasingly difficult to build brand trust, and communications and recommendations represent a kind of currency [8, p. 44]. Given that communication with customers is extremely important for the creation of a base of loyal customers, digital marketing, or as it is more often called Marketing 4.0, represents the foundation for the realization of marketing goals.

By reviewing the literature, it has been noticed that digital, Internet, online, E-marketing and web marketing are often viewed as synonyms, however, Veleva and Tsvetanova note the difference among the above- mentioned terms and point out that digital marketing, as a more complex term with a wider aspect of meaning, includes the marketing activities of an organization that are an integral part of the overall marketing strategy, and not only various digital channels and new but also traditional techniques and tools are used for their implementation [34]. On the other hand, the same authors state that the Internet and online marketing have a very close meaning to the concept of digital marketing, but that their primary orientation is focused only on interacting and attracting the attention and interest of the users based on the

opportunities offered by the Internet environment. Smith and Chaffey view e-marketing as a way of thinking and a way of positioning the consumer in the center of online activities, which can effectively identify, predict and meet consumer needs [31]. Miller defines web marketing as a set of different components: online presence (website), search engine marketing, online advertising, blog marketing, online public relations, multimedia marketing, and social media marketing [21]. Although there is a tendency in the literature to equate the terms analyzed, the differences in conceptual definitions are evident and indisputable, therefore, for the purposes of this work, the term digital marketing will be used, as the most comprehensive and complex one that includes all other terms. In this regard, Chaffey defines digital marketing as the use of information and communication technologies to support marketing activities in order to meet consumer needs [5]. Similarly, Mahmutović states that Marketing 4.0. represents the achievement of marketing goals through the use of the Internet and other digital technologies in business [19]. Quinton and Simkin believe that digital marketing enables consumers, businesses and other stakeholders to create exchange and access digital content [27]. Summarizing the above-mentioned definitions, we notice that digital marketing primarily includes the implementation of modern technology in order to meet the consumers' needs, and as Jevremović et al. state, includes the following:

- Applying these technologies which form online channels to the market: Web, email, databases, mobile/wireless and digital TV;
- Support marketing activities aimed at achieving profitable acquisition and retention of customers within a multichannel buying process and customer lifecycle;
- Through using marketing tactics recognizing the strategic importance of digital technologies and developing a planned approach to reach, migrate, and retain customers to online services through ecommunications [14, p. 186].

Noticing the changes caused by the development of digital marketing, both for the company and consumer, Kotler and Keller highlight as the greatest, but also at the same time the most important changes for consumers as following opportunities:

- The use of the Internet as an extremely powerful tool for finding information and efficient shopping;
- Search, communication and shopping available on the go and 24 hours a day;
- The possibility of active and two-way communication with companies (reception of marketing and sales materials, notifications about coupons, the possibility of writing a review, etc.);
- Social networks through which consumers can express their opinions and loyalty;
- The possibility of rejecting marketing activities that consumers consider inappropriate (there us the possibility of blocking online messages, ignoring advertisements and avoiding marketing incentives), [16, pp. 16-17].

Various digital marketing techniques are used in order to realize the mentioned opportunities and as such to contribute to the achievement of marketing goals, which, with a properly formulated marketing strategy, contribute to attracting new and retaining existing customers, but their role in creating a user experience and engaging consumers in co-creation is particularly noteworthy. Among the others, Veleva and Tsvetanova highlight the following as the most important digital marketing techniques:

1. Websites
2. E-mail marketing
3. Social media
4. Mobile marketing and
5. Search engines advertising [34].

Today's belief is that companies that are not present on the Internet do not exist at all, so the presence of the companies on the Internet is very significant. According to the Statistical Office of the Republic of Serbia 83.5% of households uses the Internet, while the 100% of companies that took part in research uses the Internet in the Republic of Serbia in 2022 [29].

Websites as an extremely up-to-date technique of digital marketing influence the user experience and enable the company to present and sell products and services on the Internet, communicate with the target group, identify the needs and wishes of consumers, as well as their involvement in the process of joint creation

(co-creation). Lalević points out that the environment for placing products on the market is a strategic determinant in digital marketing and the creation of an adaptable site is crucial, so that consumers can virtually research, order and monitor the availability and delivery of products and services [18]. Entrepreneurs should design a website that will be an expression of their activity, history, product, vision and at the same time attractive at first glance and interesting enough to actuate the visitor to visit it again [11]. There are corporate and marketing websites and while the corporate websites usually offer basic information about a company's history, mission and philosophy, products and services and are created to support customer-initiated interactive communication, the marketing websites are designed to engage customers in seller-initiated interaction, and which will bring them closer to purchase or to other marketing outcomes [3]. E-mail marketing has been considered one of the most effective methods of online marketing which enables sending promotional messages to internet users [4], as well as interactive communication between the company and its consumers. Chittenden and Rettie recognize electronic mail as a major tool for customer retention, primarily due to its advantages in terms of speed and low marketing costs [7]. Considering the fact that consumers treat their inbox as a personal domain, the same authors point out that as long as companies do not abuse this privilege they have the ability to build profile, awareness and, ultimately, a profitable relationship with persons they communicate with [7].

Njegomir emphasizes the importance of social media and states that with their help, marketers can build or join online communities, invite consumers to participate in something and thus create long-term marketing assets in that process [26]. Although the same author points out that Social Networks, as one of the forms of social media, have a non-commercial purpose [26], Bostanshirin believes that marketing through the mentioned technique is especially promising for small businesses because it increases their competitive advantage and therefore becomes more and more a priority [4]. This is supported by the fact that small entrepreneurial firms that are at the beginning of their life cycle start their Internet sales through social networks. Opening a Facebook page has become a business requirement for many companies [24]. For entrepreneurs, feedback from their consumers and service users about the level of satisfaction and user experience is particularly important, that's why Milić, among others, states low costs and interaction with consumers as one of the most significant advantages of social media [20], [13].

Mobile marketing is developed with the expansion of mobile technologies, and it uses mobile devices as the main interactive way of communication between the company and the user [32, p. 21]. The Mobile Marketing Association, as a world professional organization for mobile marketing, defines this term as a set of practices providing organizations opportunities to connect with their target market in an interactive and relevant way with and through any mobile network or device [23]. Research shows that 95.5% of the population used a mobile phone [29] in the Republic of Serbia in 2022 year therefore the intensive growth of this form of communication and sales is completely justified. In mobile marketing, entrepreneurs can use: text and MMS messages, mobile applications, mobile web, location services, social media and advertising to connect with consumers through their "smart" phones or tablets [32]. As an advantage of the mentioned technique, Njegomir states that mobile devices give entrepreneurs the opportunity to personalize their messages, advertisements and applications based on demographic, geographic and other characteristics of consumer behavior, thus ensuring more relevant messages and better targeting, while saving limited financial resources [26].

Search engine advertising is paid for by businesses that are interested in displaying ads for their products, services and sites alongside search engine results. Businesses bid for keywords, and their ad is displayed when the keyword is queried in the search engine [12]. Companies must carefully approach the selection of keywords and the success of this technique often requires the development of a special plan, because as Steel states, the display of a company's ad next to or above the search results depends on how much money that company has offered and on the algorithm that the search engine uses to determine the relevance of an ad for a specific search [33]. Although the advantage of the mentioned technique seems to be reduced to the informative function, marketers believe

that consumers who have already expressed interest by starting a search on the Internet are the primary potential consumers [26], therefore, paid ads at the top of the search results are an effective digital marketing technique that can help the company in the creation of its consumer base.

Marketing as a business function in the company makes its contribution to the creation of user experience and the engagement of consumers in the process of co-creation, given that it emphasizes the customer to the fore. However, the presented characteristics of digital marketing technique, as well as consumers' behavior today, indisputably confirm that the contribution of the mentioned techniques is far greater than traditional marketing techniques. Namely, the Nielsen-Norman Group views the user experience as all aspects of the end-user's interaction with the company, its services, and its products [25]. Allam et al., point out that user experience's unit of analysis is very flexible, and it can be a single aspect of "an individual end-user" interaction with a "standalone application" or aspects of "multiple end-users" interactions with the "company and its merging of services from multiple disciplines" and therefore we must understand how the user feels about the system [1]. Given that Veleva and Tsvetanova, as the primary advantage of digital marketing, emphasize a high level of interactivity – the possibility for interactive communication with consumers [34], and that on the other hand, user experience is related to the interaction between the company and the consumer, the correlation between digital marketing techniques and user experience is obvious. The connection between digital marketing and user experience can also be observed through the increasingly frequent meeting of consumer expectations and needs precisely through online interaction and services, because as Ćuzović and Labović state, there is a kind of competition on the stage between companies that base their competitive recognition and business performance on novelties that brings with it modern informatics and electronics, while the number of users who communicate and buy via the Internet is constantly growing [9].

In addition to the connection with the user experience, the advantages of digital marketing highlight its contribution to the engagement of consumers in the co-creation process. Doorslaer defines the process of co-creation as a partnership with the customers where value is created by both the firm and the customer can get involved at just about any stage of the value chain [10]. Co-creation is creating an experience environment in which customers can have an active dialogue and co-construct personalized experiences and product may be the same, but customers can construct different experiences [10]. Veleva and Tsvetanova point out that digital marketing creates opportunities for developing new business models and strategies such as mass customization, co-creation and consequently provides the opportunity to be more responsive to their needs and understandings [34]. In this regard, companies use various digital techniques in order to allow customers to write a review, share their experience, select the features or functions they want their product to have, choose the method and time of delivery, etc.

Research methodology

In accordance with the presented analysis of the theoretical basis, the authors present the subject of research which, as stated in the introductory part of this paper, refers to the role and importance of digital marketing techniques in building a base of loyal consumers, as well as the advantages of using them in creating a user experience and engaging customers in the process of joint creation. The aim of this research is multiple and is reflected primarily in the analysis of the respondents' presence on the Internet, with special reference to the frequency and purpose of its use, and therefore the examination of the respondents' opinions and attitudes about the techniques that are the subject of the analysis, specifically: websites, social networks, mobile marketing, search engine advertising, and email marketing. Also, the aim is to analyze the reaction of the respondents to the promotional content placed through the aforementioned techniques, as well as the examination of their willingness to accept it. The subjects of the special analysis are the factors that determine, on the one hand, the decision to purchase products or services and, on the other hand, loyalty to a particular brand. Considering all the above, the author's goal is to analyze the contribution of the quality of online services and interaction with the company, to examine

the contribution of digital marketing techniques in the creation of user experience and co-creation, with special reference to the respondents' views on the possibility of writing a review via digital platforms, as well as on their willingness to participate in the same.

The basic hypothesis put forward by the authors of this paper is as follows:

- The decision of respondents, primarily Internet users, to choose and purchase a certain product is conditioned by the promotional content available to them through digital marketing techniques, while their user experience is conditioned by the quality of online services.

In addition to the basic one, the authors also define auxiliary hypotheses:

1. Respondents who are more often present on the Internet are more willing to accept promotional content placed through digital marketing techniques;
2. Respondents of different age groups are not equally ready to interact with the company and approach the realization of electronic transactions;
3. Digital marketing techniques contribute to the creation of user experience;
4. Respondents show a high degree of willingness to participate in surveys sent to them by companies through various platforms, especially through e-mail, mobile applications and websites;
5. Respondents who accept the use of digital techniques try to express their opinion, creativity and imagination, as well as their needs for products or services, through reviews on digital platforms;
6. Respondents who write reviews on digital platforms are more willing to take part in different segments of the product co-creation process and consider co-creation useful for the offer personalization.

335 respondents participated in the research process, conducted in the period from April to June 2023, in municipalities on the territory of the Republic of Serbia. The research was conducted through a survey, actually through a questionnaire that contained 30 questions in total and was distributed to randomly selected respondents on paper and electronic form (Google Forms). The questions in the questionnaire are classified into five groups. The first group (consists of 9 questions) includes basic information about the respondents: gender, age, marital status, municipality where they live, level of education, work status, average income, number of household members. The second group (10 questions) is related to the use of the Internet, and as such contains questions related to the frequency and purpose of Internet use, attitudes, reactions and readiness of respondents to accept promotional content marketed through the analyzed techniques, as well as the factors that determine the decision about purchases and consumers loyalty. The third group of questions (5 questions) is aimed at examining the views of the respondents on the implementation of electronic transactions, but also on the motivational factors that influenced trust building. The fourth group includes one question presented in the form of a scale for measuring the quality of online services [35, p. 1163] and contains 20 items in total distributed in 6 analyzed dimensions, namely: reliability (3), responsiveness (3), employee competence (3), ease of use (3), product portfolio (4) and security (4), while the answers are shown on a five-point Likert scale (1 – strongly disagree 2 – disagree, 3 – neither agree nor disagree, 4 – agree, 5 – strongly agree). The fifth group (5 questions) is related to the quality of interaction with the company and the importance of being able to write a review in creating the user experience and engaging customers in the co-creation process. In this regard, the last group contains questions related to respondents' willingness to write reviews on digital platforms, their opinion about their contribution to the personalization of the offer, as well as questions about their willingness to participate in certain segments of joint creation of products or services.

Furthermore, the methodology of the work is focused on the review of the literature and through the method of comparison a comparative analysis of the obtained results and previous research on the mentioned topic was performed. The IBM SPSS Statistics-version 26 platform was used for data processing. Descriptive statistics, cross-tabulation, Cronbach's alpha coefficient, the Kolmogorov-Smirnov test, and the Pearson correlation coefficient were performed in the mentioned platform.

Results of the research

A five-point Likert scale, from 1 – strongly disagree, to 5 – strongly agree, was used to determine the views of the respondents on the influence of the quality of online services on the perception and creation of user experience, as well as to analyze the views on digital marketing techniques, the importance of reviews and customer interactions. Cronbach's α coefficient values ranged from 0.928 to 0.943, which shows high reliability and internal agreement of the observed scales.

The gender structure of the sample shows that 186 women (55.5%) and 149 men (44.5%) took part in the research. Although respondents from various municipalities throughout the Republic of Serbia (out of a total of 31 municipalities) participated in the survey, the largest number of respondents came from Kosovo and Metohija, namely from: Leposavić (22.1%), then Kosovska Mitrovica (14.9%), Zvečan (13.7%), Zubin Potok (6.6%) and Gračanica (3%), while a significant number of participants came from Raška (7.8%), Belgrade (4.8%) and Niš (3.3 %).

As shown in Table 1, the majority of respondents are between 26 and 35 years old (36.1%), while the approximate participation of those who are surveyed is between 16 and 25 years old (33.1%). The educational structure shows that they are mostly respondents with bachelor's degree (34.9%), with master's degree (14.0%), and doctoral degree (2.1%). The analysis of work status found that the participation of respondents who are unemployed dominates (35.2%), while the cross-analysis shows that it is a student population, i.e., respondents who are still studying. The largest number of respondents earns income in the amount of 40,000 to 60,000 dinars (28.1%), and the cross-tabulation shows that those are temporary and permanent employees (30.4%).

The data shown in Table 2 also show that the use of the Internet is growing exponentially, considering that all respondents use the Internet. 84.8% of them use it regularly on a daily basis. Also, looking at the past month, we conclude that the participation of respondents who use the Internet 6 or more times a day (43%) dominates, while the participation of those who use it 2-3 times per day (27.5%), and 4-5 times per day (23.9%) is significant. The respondents were asked the question "For what purpose do you use the Internet?", and the largest number of respondents answered for getting information (71.6%) and for communication with other people (69.3%), while education (42.1%), entertainment (38.5%), and shopping (36.1%) were chosen by smaller number of respondents. In order to support above-mentioned results, there is a fact that the majority of respondents use social networks 30 minutes to an hour and a half per day (34.3 %) given that social networks have an informative, but also an interactive function.

The respondents were asked the question "*What is your attitude towards the use of digital marketing*

Table 1: Structure of the sample according to age, level of education and work status

	Variables	Number of respondents	
		N	%
Age	16-25	111	33.1
	26-35	121	36.1
	36-45	60	17.9
	46-55	34	10.1
	More than 55 years old	9	2.7
Level of education	Primary education	2	0.6
	Intermediate education	98	29.3
	College for applied studies	64	19.1
	Bachelor's degree	117	34.9
	Master's degree	47	14.0
	Doctoral degree	7	2.1
Work status	Unemployed	118	35.2
	Temporary employees	102	30.4
	Permanent employees	102	30.4
	Entrepreneur (the owner of his/her own business)	3	0.9
	Retiree	10	3.0

Source: Authors' research

Table 2: The use of the Internet by respondents

Number of respondents	Questions									
	Do you use the Internet?				How often did you use the Internet last month?					
	No, never	Sometimes	Several times a month	Several times a week	Regularly on a daily basis	Once a week	Once a day	2-3 times a day	4-5 times a day	6 or more times a day
N	0	16	5	30	284	6	13	92	80	144
%	0	4.8	1.5	9.0	84.8	1.8	3.9	27.5	23.9	43.0

Source: Authors' research

techniques (marketing via website, social networks, search engines, mobile applications and e-mail)?", and the largest number of respondents give an answer that they agree with the use of the mentioned techniques, specifically 49.3% of them points out that they accept in most cases, and 25.1% fully accept the use of them. Considering that the mentioned techniques are mostly used for the placement of promotional content, respondents were asked the question "*How do you react to promotional content placed through digital marketing techniques?*", to which the majority of respondents answered that they notice content placed in that way, however 46.3% of them notice, but partially accept the same, while 22.1% of respondents fully accept promotional content placed through the aforementioned techniques. Analyzing the respondents' opinions on which technique they consider most suitable for placing promotional content, it was found that 49.3% of respondents consider social networks the most suitable technique, then 28.7% of them vote for a website, and 13.7% of them consider Internet browsers as the most suitable. The subject of a special analysis was the evaluation of respondents to what extent they are personally ready to accept promotional content placed through different digital marketing techniques. Regarding this, the participation of those who rate their readiness with the highest rate in order to accept promotional content via social networks (44.5%), websites (33.7%) and mobile applications (29.3%) dominates, which can be justified by the fact that an increasing number of companies use the above-mentioned platforms for promotional purposes.

The importance of digital marketing techniques is confirmed by the data shown in Figure 1, which clearly show that the decision to buy a certain product among the majority of respondents is conditioned by the company's promotional content placed through digital marketing technique. Through cross-analysis, it was established that it is primarily a matter of respondents who accept promotional content placed through the mentioned techniques, so it is not surprising that the decision to buy is conditioned by the same factors. The

Figure 1: Respondents' attitude toward the question "Is your decision to buy a certain product conditioned by the company's promotional content placed through digital marketing techniques?"

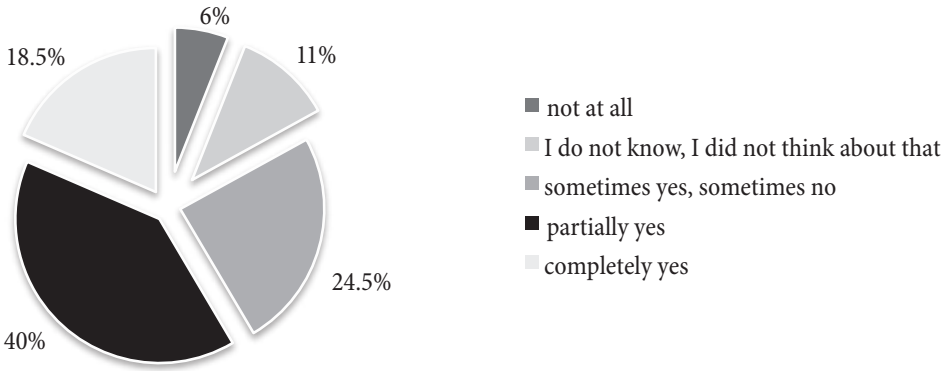
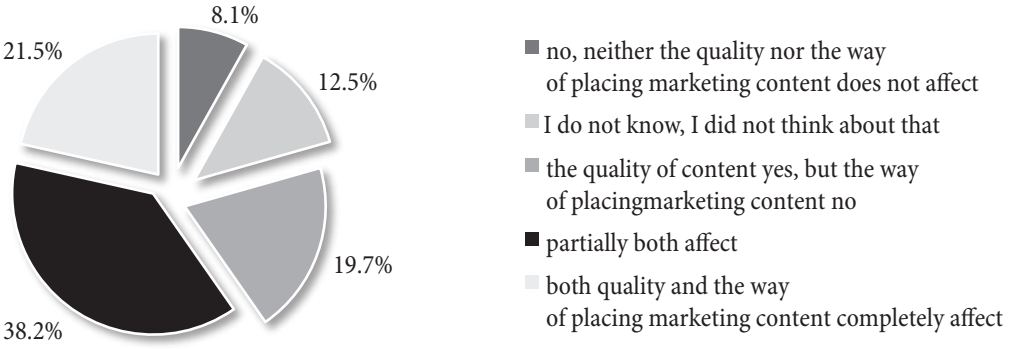


Figure 2: Respondents' attitude toward the question "Does the quality and way of placing marketing content affect your loyalty to a particular product or brand?"



Source: Authors' research

fact that 24.5% of respondents had a neutral attitude (the decision to buy a product is sometimes conditioned by promotional content, and sometimes not) can be justified by the existence of other factors such as: product value, delivery conditions, payment method which influence purchase decision.

The majority of respondents point out that their loyalty to a certain brand is partially influenced by the quality and way of placing marketing content (38.2%), while more than one fifth (21.5%) of respondents consider that their loyalty to a certain brand is completely influenced by the quality and way of placing marketing content (Figure 2). The authors start from the assumption that the use of digital marketing techniques affects the getting of new and retention of existing customers, which is confirmed by the data indicating that the decision to purchase, as well as the loyalty of respondents, is conditioned by the use of the mentioned techniques.

We analyzed the opinion of respondents on the importance and influence of the mentioned dimensions on the perception and creation of user experience with the scale on the quality of online services, through several segments: reliability, responsiveness, employee competence, ease of use, product portfolio and security. The results shown in Table 3 clearly show that, for the majority of respondents, the mentioned variables from all areas are particularly important for the process of perceiving and creating user experience. In this regard, companies need a properly formulated marketing strategy, the implementation of which will create a quality package of online services that is in line with the needs and wishes of consumers. Following up on the segments that influence the creation of the user experience, the respondents were asked the question "*Does the interaction with the company whose products you buy, as well as the possibility to write a review, affect your user experience*?", and 38.5% of the respondents answered that it influences partially, while 22.7% of them stated that it influences completely, and only 5.1% of respondents had a negative attitude (no, not at all). It is about the dominant participation of respondents who are ready to communicate with the company and express their opinion, creativity, imagination, needs and wishes, but also share their experiences through leaving reviews via digital platforms.

Table 3: Respondents' opinion on the importance of the quality of online services for the perception and creation of user experience

Variables	Respondents' answers * %				
	1	2	3	4	5
The company performs the service correctly for the first time.	2.4	12.5	27.5	**41.8**	15.8
My online transactions are always accurate.	1.2	8.1	20.9	**47.8**	22.1
The company keeps my records accurately.	1.8	11.3	28.4	**35.8**	22.7
I get quick responses to my requests via email.	1.5	12.5	22.1	**41.5**	22.4
The company quickly resolves any issues I encounter.	1.8	9.3	28.1	**38.8**	22.1
The employees of the company provide me with fast service.	1.8	10.4	26.0	**38.5**	23.3
The employees of the company have the knowledge to answer to my questions.	1.8	9.6	22.1	**44.5**	22.1
Employees of the company properly solve all problems that arise.	1.8	8.1	27.8	**40.3**	22.1
The employees of the company meet my requirements.	1.8	9.6	23.0	**46.3**	19.4
Using a company website requires a lot of effort.	8.7	13.7	23.3	**34.0**	20.3
The organization and structure of online content is easy to follow.	0.6	4.8	19.1	**43.3**	32.2
It is easy for me to make a transaction via the company's website.	1.5	5.4	16.4	**45.1**	31.6
All my service needs are included in the menu options.	0.3	9.3	18.2	**43.9**	28.4
The company offers a wide range of products.	1.2	6.9	14.6	**43.6**	33.7
The company provides services with the features I want.	0.9	8.1	17.0	**42.1**	31.9
The company provides most of the services with features I need.	1.2	6.0	18.2	**43.3**	31.3
The company will not abuse my personal information.	2.7	6.3	17.6	**40.9**	32.5
I feel safe while doing online transactions.	2.1	8.7	15.2	**40.3**	33.7
I feel safe providing sensitive information (for example credit card number) for online transactions.	2.4	10.7	16.7	**38.2**	31.9
I feel that the risk associated with online transactions is low.	2.7	7.2	18.2	**38.2**	33.7

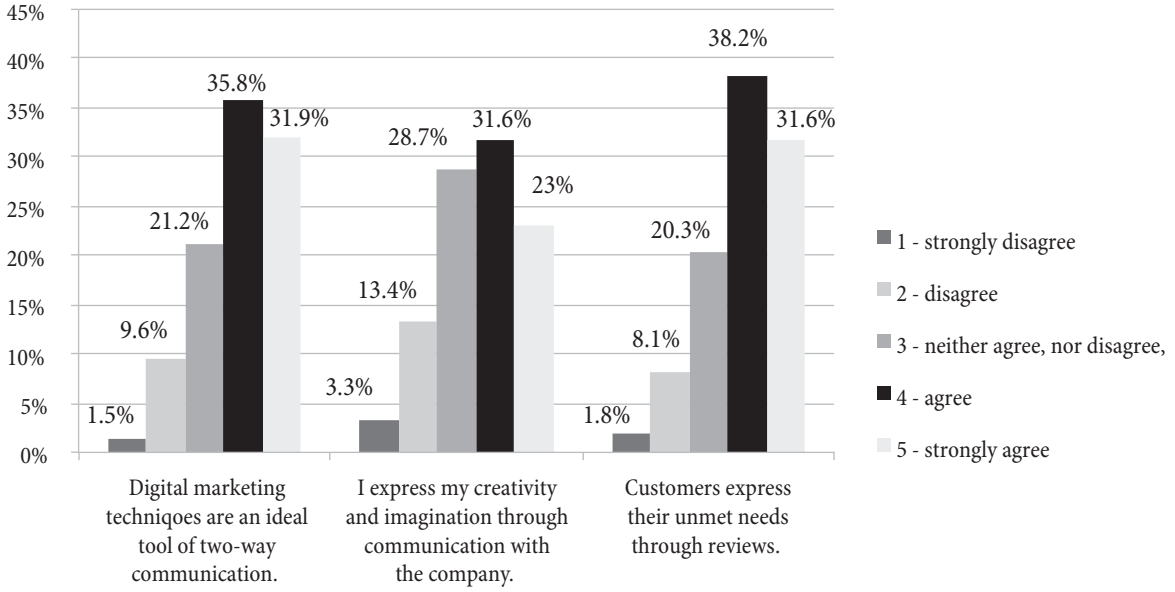
Source: Authors' research

* 1 – strongly disagree; 2 – disagree; 3 – neither agree nor disagree; 4 – agree; 5 – strongly agree.

The potential of digital marketing techniques for interactive communication is also recognized by the respondents, given that most of them (35.8%) perceive the just mentioned techniques as an ideal tool of two-way communication and a "place" where the voice of every customer is heard. Companies use the mentioned techniques in order to get feedback from their customers, and in order to recognize their needs and desires. In this regard, customer reviews are becoming an increasingly current technique that businesses are developing across all digital platforms. The importance of these is also recognized by the respondents who took part in this research because the results presented in Figure 3 show that the majority of respondents believe that through reviews customers express their unmet needs and wishes (38.2%), and the dominant are those who express their creativity and imagination in terms of product features (31.6%) through communication with the company.

By agreeing with certain statements, respondents expressed their opinion on the usefulness of reviews and their willingness to participate in them. With the statement "*Reviews are extremely useful and can help to attract new customers.*", 42.1% of respondents agreed, while 30.1% of them strongly agreed, and according to only 2.1% of respondents, reviews do not have the function of attracting new customers. In addition to this, the majority of respondents, specifically 46.8% of them (31.3% - agree, 15.5% strongly agree) agreed with the statement "*Whenever there is an opportunity to do so, I leave a review on the platforms used by the company.*", while 6.9% of respondents do not express their opinion through reviews.

Figure 3: Respondents' opinion on reviews and communication with the company



Source: Authors' research

Table 4: Willingness of respondents to participate in different segments of co-creation

Segments of co-creation	Assessments on the respondents' readiness* %				
	1	2	3	4	5
Presenting a product idea.	3.6	14.3	23.9	24.8	***33.4***
Projection of the product in terms of features.	4.5	13.7	23.0	27.2	***31.6***
Participation in product prototyping workshops.	8.7	24.5	***31.6***	20.6	14.6
Distribution channel projection.	10.4	25.4	**28.4**	20.0	15.8
Participation in product testing workshops.	12.5	20.6	**25.7**	17.3	23.9
Participation in product promotion activities.	10.7	17.3	23.6	22.7	**25.7**

Source: Authors' research

* 1 –insufficient grade; 2 – sufficient; 3 – good 4 – very good; 5 – excellent grade.

As already mentioned, customer reviews can be used to identify unmet needs and wishes of consumers, especially for the purpose of engaging them, which can contribute to the personalization of the company's offer. In this regard, surveys sent to the target market represent a way in which customers, existing and potential one can be involved in the process of joint creation, i.e., in the process of co-creation. Respondents were asked the question "*Have you ever participated in surveys and expressed your ideas about product design and production*?". Most of them answered yes once or twice (27.2%), while the number of those who have done it three or four times is significant (16.7%), but also those who have done it more than four times (11.6%). However, the participation of those who have never participated in surveys before (23.9%), precisely more than one-fifth should not be ignored either.

Analyzing the different segments of co-creation in which customers can engage (Table 4), it was found that the majority of respondents rate their willingness to participate in the presentation of the product idea (33.4%) as well as in the projection of the product in terms of characteristics (31.6%) with the highest rating. We are talking about the respondents who had a certain attitude regarding the statement "*I prefer to visit websites or platforms where I have the possibility to choose product features or different purchase conditions*." namely: 37.9% of them agreed, while 25.4% strongly agreed with the stated statement. Such results are expected, given that the possibility of product projection, as well as the choice of purchase conditions, is offered to customers today through various digital platforms. In addition to this, respondents rate their willingness to participate in product promotion activities (25.7%) with a high score. Also, this data is not surprising, given that the majority of respondents have a positive attitude towards the use of digital marketing techniques, and they accept promotional content placed in that way, while on the other hand, their willingness to participate in surveys and customer reviews is growing intensively and must not be ignored. Joint creation, i.e., co-creation, is recognized by the respondents as a way of adapting the offer to the demands and needs of customers. In this regard, to the question "*In your opinion, can the participation of customers in the process of joint creation of products/services help companies to adapt their offer to the demands and needs of customers*?", the majority of respondents, i.e. 36.7% of them, answered yes, partially, and 35.3% yes, completely, while only 3.6% of respondents had a negative attitude (no, not at all).

Discussion

Whether and to what extent respondents' attitudes and opinions on digital marketing techniques and their impact on user experience and the process of co-creation directly depend on gender, age, level of education, work status, but also on other variables, was examined through correlation analysis. Also, the above-mentioned analysis was used to test the set hypotheses. For this purpose, the Kolmogorov-Smirnov test of normality was performed for each variable individually.

There is a statistically significant relationship between the variables "*Age*" and "*Do you use the Internet?*" (p = 0.000), while the Pearson coefficient shows a negative relationship of insignificant strength ($\rho = -0.244$), which means that the older respondents less use the Internet than the younger ones. Also, it was established that the frequency of Internet use depends on the level of education, with a statistically significant relationship ($p = 0.000$) and a Pearson coefficient of insignificant positive relationship ($\rho = 0.212$), which shows that respondents with a higher level of education use the Internet more often, which is a consequence of using the Internet for educational purposes,

Table 5: Relationship between respondents' attitudes towards the use of digital marketing techniques, age and frequency of Internet use

Variables What is your attitude towards the use of digital marketing techniques?		Age	How often did you use the Internet in the last month?
Sig. (2-tailed)	p	0.000	0.000
Pearson corr.	ρ	−0.272	0.243

Source: Authors' research

but also for business purposes, given that by the cross-analysis it was established that these are the respondents who are employed.

The results shown in Table 5 show that the respondents' attitude towards the use of digital marketing techniques is conditioned by their age, and the Pearson coefficient of a weak negative relationship shows that people who are older are less likely to accept the use of the mentioned techniques. On the other hand, the respondents' attitudes are also influenced by the frequency of Internet use, and the Pearson coefficient of a positive relationship of insignificant strength shows that respondents who use the Internet more often accept the use of digital marketing techniques to a greater extent.

Between the variables "*What is your attitude towards the use of digital marketing techniques?*" and "*How do you react to promotional content placed through digital marketing techniques?*" there is a statistically significant relationship with (p = 0.000), a Pearson coefficient of positive relationship of moderate strength (ρ = 0.540), which shows that respondents who support the use of the mentioned techniques, more often notice and accept marketing content placed through them. The results are in accordance with the opinion of a group of authors who pointed out a decade and a half ago that the use of digital techniques provides support for marketing activities by which the company attracts new and retains existing consumers, through simultaneous interaction through different channels [6].

The respondents' willingness to accept marketing content placed through different digital marketing techniques is conditioned by their opinion about the use of the aforementioned, as indicated by the data shown in Table 6. Namely, statistically significant relationships with the Pearson coefficient of different strengths show that the respondents who have a positive opinion about the use of digital marketing techniques are more willing to accept marketing content available to them through websites, mobile applications, social networks, e-mail and Internet browsers. The correlation that shows the willingness of the respondents to accept promotional content is strongest with websites and social networks, which proves the remarkable potential of these techniques in the realization of promotional activities. The fact that companies in the Republic of Serbia recognize this is confirmed by the data that 84.9% of companies owned their own website [29] in 2022. On the other hand, the actuality of social media as a digital marketing technique is indicated by the fact that in the Republic of Serbia in 2022, participation in social networks took the third place with a percentage participation of 81.9% as a purpose of using the Internet.

Basic hypothesis: The decision of respondents, primarily of those who use Internet, to choose and purchase a certain product is conditioned by the promotional content available to them through digital marketing techniques, while their user experience is conditioned by the quality of online services. Considering the fact that for the majority of respondents the purchase decision is conditioned by the promotional content that the company places through digital marketing techniques (58.5%) (Figure 1) and that the interaction with the company, as well as all the variables that express the quality of online services, are evaluated as very important for the creation of user experience (Table 3), we conclude that all the mentioned data stand for the authors' basic hypothesis. However, in order to prove the basic hypothesis, correlation analysis was used in order to examine the relationship between several variables, namely: "*Do you use the Internet?*", "*Is your purchase decision conditioned by promotional*

Table 6: Relationship between respondents' opinion about the use of digital marketing techniques and their willingness to accept content placed through certain techniques

Variables	Willingness of respondents to accept promotional content placed through the aforementioned techniques.				
What is your attitude towards the use of digital marketing techniques?	Content placed through websites	Content placed through mobile applications	Content placed through social networks	Content placed through e-mail	Content placed through Internet browsers
Sig. (2-tailed) p	0.000	0.000	0.000	0.000	0.000
Pearson corr. ρ	0.278	0.281	0.333	0.193	0.190

Source: Authors' research

content placed through digital marketing techniques?" and "*Depending on how the quality of online service affects your perception and creation of user experience, rate the degree of agreement or disagreement with the presented statements?*" (six statements that are an expression of the quality of online services).

The statistically significant relationship between the observed variables shown in Table 7 shows that Internet users' purchase decision is conditioned by promotional content available through digital marketing techniques, while their user experience is influenced by the quality of online services. Based on the presented results, the author's basic hypothesis was fully confirmed. Following up the Mitrović's view that it is not easy to suit the new online customers who have the power to constantly redefine the shopping experience they want to have, especially not today, in a world that is constantly "turn on" and that demands digital content, digital options and 24/7 availability [22], the authors recognize the potential for retaining existing and attracting new customers precisely in the application of digital techniques.

Auxiliary hypothesis I: Respondents who are more often present on the Internet are more willing to accept promotional content placed through digital marketing techniques. Between the variables "*How often have you used the Internet last month?*" and "*How do you react to promotional content placed through digital marketing techniques?*", there is a statistically significant relationship ($p = 0.000$), with a Pearson correlation coefficient of weak positive strength ($\rho = 0.279$), which shows that respondents who are more often present on the Internet are more willing to accept promotional content available to them through digital marketing techniques. We are talking about respondents who are ready to accept digital marketing techniques and use the Internet for getting information and shopping, and the stated results are not surprising and are on the side of auxiliary hypothesis I.

Auxiliary hypothesis II: Respondents belonging to different age groups are not equally ready to interact with the company and approach the realization of electronic transactions. A statistically significant relationship was determined by correlation analysis ($p = 0.002$), between the two variables "*Age*" and "*I like to communicate with the company whose products I buy and use.*", with a Pearson coefficient of negative insignificant strength ($\rho = -0.170$), which points to the conclusion that older people are less likely to communicate with the company whose products they buy. In addition to this, the age structure affects the willingness of the respondents to carry out electronic transactions, actually online shopping. Namely, statistical significance ($p = 0.000$), exists between "*Age*" and the variable "*Have you ever made a purchase via the Internet?*", while the Pearson correlation coefficient with a weak negative relationship ($\rho = -0.253$), shows that the older the respondents, the less ready they are to approach the realization of electronic transactions. The above results can be justified by the fact that older respondents grew up in an age when digital technology did not have the form it has today, and they often feel a certain amount of repulsion towards its use. In addition to this, digitalization, as a key global trend in the modern economy, has launched a new era of innovation in which technological progress

Table 7: Correlation analysis of basic hypothesis testing

Variables		Do you use the Internet?	
		Pearson corr. p	Pearson corr. ρ
Is your decision to buy a certain product conditioned by the company's promotional content placed through digital marketing techniques?		0.003	0.162
The quality of online services*	My online transactions are always accurate.	0.000	0.238
	The company quickly resolves any issues I encounter.	0.024	0.124
	The employees of the company have the knowledge to answer to my questions.	0.000	0.193
	It is easy for me to make a transaction via the company's website.	0.001	0.184
	The company offers a wide range of products.	0.001	0.173
	I feel safe while doing online transactions.	0.003	0.164

Source: Authors' research

* Due to the length of the text, six variables that express the quality of online services (one from each dimension) are shown in Table 7, although by the correlation analysis it was established that there is a statistically significant relationship between the use of the Internet and 17 statements out of a total of 20.

results in the creation of new processes and products, but also significant changes, especially in marketing and organization [15], so in relation to this, older people need more time to overcome the use of digital techniques.

Auxiliary hypothesis III: Digital marketing techniques contribute to the creation of user experience. The importance of digital marketing techniques for the creation of user experience is analyzed through the customers' ability to choose the characteristics of products and services, which consequently leads to the personalization of the offer, which is the way of being satisfied consumers. Also, the subject of the analysis is the influence of the quality of the achieved communication on loyalty to a certain brand, which is often based on a positive user experience. Namely, 44.8% of respondents agreed with the statement "*Compared to the traditional purchase model, digital marketing techniques provide customers with a greater opportunity to choose the product or purchase conditions they want.*", while 24.5% of them completely agreed with the same statement. In addition to this, 61.2% of the surveyed respondents claim that interactions that are realized with the company through digital marketing techniques affects the creation of the user experience.

The statement that communication is extremely important in retaining existing customers is confirmed by the fact that loyalty to a certain brand in 40.9% of respondents is conditioned by the quality of the interaction with the company while as many as 34% of respondents had a more confident attitude and strongly agreed with the above mentioned statement. As a comparison, Roto and Kaasinen consider user experience as a term that describes the user's feelings towards a certain product, system or object during and after interacting with it, whereby different aspects influence the feelings, namely: user expectations, the conditions in which the interaction takes place, as well as the ability of the system to meet the current needs of users [30]. In that case, the assumption that digital marketing techniques have an impact on the user experience is confirmed by the fact that the majority of respondents (67.8%) rate social networks as the platform which is the easiest way for achieving communication with the company, specifically 38.2% of them agreed, and 29.6% strongly agreed with the mentioned statement. Because of that, the stated results are in favor of auxiliary hypothesis III and therefore confirm it.

Auxiliary hypothesis IV: Respondents show a high level of willingness to participate in surveys sent to them by companies through various platforms, especially through e-mail, mobile applications and websites. Although the majority of respondents are ready to participate in surveys sent to them by companies via digital platforms (46.8%), analyzing in particular mobile applications, e-mail and website as the platforms through which surveys are most often sent and where customers can express their opinions, it was found that respondents who participated in this research most often write reviews on websites, considering that 26.6% of them agreed, and 9.6% strongly agreed with the statement "*I am happy to answer the surveys posted on the website of the company whose products I buy.*" On the other hand, mobile applications and e-mail as platforms for customer surveys took a smaller part**,** as 37% of respondents agreed with the statement "*I ignore surveys sent to me by companies through mobile applications.*", while 28.1% had a neutral attitude and more than one quarter had a negative attitude (25.1%), when it comes to the following statement "*I respond to surveys sent to me by companies via e-mail.*" The stated results confirm the auxiliary hypothesis IV partially, and only in terms of the respondents' high willingness to respond to surveys sent to them through the website, while disputing it in terms of

Table 8: Correlation analysis of testing auxiliary hypothesis V

Variables	What is your attitude towards the use of digital marketing technique?	
	Sig. (2-tailed)	Pearson corr.
	p	*ρ*
I leave a review on the platforms that the company uses whenever it is possible.	0.000	0.262
I try to express my needs and wishes regarding the product through communication with the company.	0.000	0.248
I express my creativity and imagination regarding product features through communication with the company.	0.000	0.256

Source: Authors' research

mobile applications and e-mail. Bostanshirin also pointed out the limitations of using e-mail for consumer surveys, emphasizing the users' possibility to ignore the received message, as the biggest disadvantage of marketing that is implemented via e-mail [4].

Auxiliary hypothesis V: The respondents, who accept the use of digital techniques, try to express their opinion, creativity and imagination, as well as their needs for products or services, through reviews on the platforms used by companies. The results shown in Table 8 confirm auxiliary hypothesis V, given that the positive correlation shows that respondents who accept the use of digital marketing techniques are more willing to write a review on digital platforms and thus express their creativity, imagination and needs for products and services. The importance of customer reviews is also pointed out by Cvjetković, who claims that one of the most significant characteristics of modern consumers in the Internet environment is their participation in virtual communities, where mutual interaction is achieved and consumers' suggestions and criticisms are presented through interpersonal communication [8, p. 44].

Auxiliary hypothesis VI: Respondents who write reviews on digital platforms are more willing to participate in different segments of the co-creation process, and they consider co-creation useful for the personalization of the offer. There is a statistically significant relationship (p = 0.000), with the Pearson correlation coefficient showing a weak positive relationship in almost all cases among observed variables, shown in Table 9, except in the segment of respondents' participation in product testing workshops, where it expresses a positive relationship of insignificant strength. In relation to this, the mentioned results show that respondents who write a review on digital platforms whenever they have the opportunity to do so are more willing to participate in different segments of co-creation and at the same time see the engagement of customers in the mentioned process as an opportunity that the company can use to adapt its offer to the demands and needs of customers. In this way, the results of the correlation analysis support and confirm the auxiliary hypothesis VI. The fact that consumer engagement, especially through interaction, is extremely important, Doorslaer pointed out in 2011 year stating that through two-way communication that takes place more and more often online, customers can express their requirements for products and services, especially in terms of features, but also in terms of the way the product is distributed and promoted, whereby customers practically become "product managers" [10]. The importance of consumer interaction and engagement in the co-creation process was pointed out by Andrew and Galak a decade ago, highlighting the identification of consumer needs and wishes**,** monitoring of their preferences and consequently mass customization, i.e. individual targeting of consumers, as the opportunities available to companies through digital marketing [2].

Table 9: Correlation analysis of testing auxiliary hypothesis VI

	Variables	I write a review on the platforms that the company uses whenever it is possible.	
		Sig. (2-tailed) p	Pearson corr. ρ
Participation in co-creation surveys	Have you ever participated in surveys and expressed your ideas about product design and its production?	0.000	0.397
Segments of co-creation	Presenting a product idea.	0.000	0.378
	Projection of the product in terms of features.	0.000	0.348
	Participation in product prototyping workshops.	0.000	0.333
	Distribution channel projection.	0.000	0.366
	Participation in product testing workshops	0.000	0.208
	Participation in product promotion activities.	0.000	0.283
Do you think that the participation of customers in co-creation can help companies to adapt their offer to the demands and needs of customers?		0.000	0.306

Source: Authors' research

Conclusion

Based on the presented detailed theoretical analysis and conducted empirical research, it can be concluded that the development of modern information and communication technology has real and strong effects on both people and business trends of today. Namely, today's customers value their time more and more, they want quick feedback and an individual approach. Also, consumer satisfaction, as one of the key variables in marketing, represents the foundation of their loyalty and is increasingly measured by the quality of services, as well as the opportunities that companies provide to their customers online. In this regard, companies extensively use digital marketing techniques that have been proven as effective tool for marketing promotional content, interacting with consumers, identifying unmet needs, but also as a way to attract new and retain existing customers.

The results of the empirical research, carried out on a sample of 335 randomly selected respondents, show that the basic and almost all auxiliary hypotheses are fully confirmed, except for the fourth auxiliary which was partially confirmed. Based on the presented results, the following can be concluded:

1. The consumer's decision to accept and buy a certain product or service is conditioned by the marketing content that companies placed through digital marketing techniques and the same affect the user experience through the quality of online services, but also the interaction with customers;
2. The willingness of consumers to accept marketing content available through digital marketing techniques is influenced by their accessibility on the Internet, while the willingness to carry out electronic transactions and interact with the company is conditioned by the age structure of customers;
3. Positive user experience is conditioned by the application of digital marketing techniques, but also by interaction with the company through which customers can share their opinion and creativity, but also to express their needs and wishes regarding the characteristics of products and services;
4. Interaction with a company affects the opinion and loyalty of consumers to a certain brand, however, when it comes to surveys sent to them through different platforms, their willingness to answer them differs with certain digital techniques. Namely, consumers are more likely to respond to surveys sent to them through websites than through mobile applications and e-mail;
5. The possibility of writing a review, which is available to customers today through various platforms, represents the framework of creating a positive user experience and personalization of the offer, given that consumers who leave reviews more often are ready to take part and present their ideas in different segments of the creation and thus light the way for the personalization of the offer.

Websites, mobile applications, social networks, e-mail and Internet browsers, as digital marketing techniques give a contribution to the realization of the company's marketing goals, but also to the improvement of business, especially through the personalization of the offer, which is the key for creation of the base of loyal consumers. In this regard, we conclude that the above-mentioned techniques are ideal tools of two-way communication and that by using them the voice of every customer can be heard, which leads to achieving a double benefit for both companies and consumers, viewed through a positive user experience and a higher level of satisfaction. Realization of positive results by applying digital marketing techniques requires a properly formulated marketing strategy and especially the company's attitude that investing in the mentioned techniques is an investment, not an expense.

References

1. Allam, A. H., Hussin, R. C., & Dahlan, H., M. User Experience: Challenges and Opportunities. *Journal of Information systems Research and Innovation*, 28-36. Retrieved from https://seminar.utmspace.edu.my/jisri/download/F1_FinalPublished/Pub4_UserExperienceChallenges.pdf
2. Andrew, T. S., & Galak, J. (2012). The Effects of Traditional and Social Earned Media on sales: A Study of a Microlending Marketplace. *Journal of Marketing Research*, *49,* 624-639.
3. Avramović, M., & Popović, S. (2018). Značaj e-marketinga u digitalnoj ekonomiji. *Naučni skup: Ekonomija u digitalnom dobu.* Besjeda, Banja Luka, Republika Srpska, 60-76.

4. Bostanshirin, S. (2014). Online marketing: challenges and opportunities. *International Conference on Social Sciences and Humanities – SOCIONT14*, Istanbul, Turkey, 783-792.
5. Chaffey, D. (2015). *Digital business and e-commerce management: strategy, implementation and practice* (Sixth edition). Harlow: England.
6. Chaffey, D., Ellis-Chadwick, F., Mayer, R., & Johnston, K. (2006). *Internet Marketing Strategy, Implementation and Practice*. Pearson Education Limited.
7. Chittenden, L., & Rettie, R. (2002). An evaluation of e-mail marketing and factors affecting response. *Journal of Targeting, Measurement and Analysis for Marketing, 11*(3), 203-217.
8. Cvjetković, M., Jovanović, Z., Stepanov, S., & Cvjetković, M. (2020). Digitalne marketing komunikacije u funkciji kreiranja konkurentske prednosti na tržištu. *Marketing*, *51*(1), 43-50.
9. Ćuzović, S., & Labović, B. (2019). Elektronska trgovina u svetlu četvrte industrijske revolucije. *Novi ekonomist, 13*(1), 22-29.
10. Doorslaer, V. L. (2011). Customer Co-creation & Customer Experience Management. Universiteit Gent, Faculteit Economie En Bedrijfskunde.
11. Hauser, J. R., Urban, G. L., Liberali, G., & Braun, M. (2009). Website morphing. *Marketing Sci. 28*(2), 202–223.
12. Jafarzadeh, H., Aurum, A., D'Ambra, J., & Ghapanchi, A. (2015). A Systematic Review on Search Engine Advertising. *Pacific Asia Journal of the Association for Information Systems, 7*(3), 1-32.
13. Jamil, K., Dunnan, L., Faizan, G. R., Usman, S. M., Gillani, S. H. M. & Awan, F. H. (2022). Role of Social Media Marketing Activities in Influencing Customer Intentions: A Perspective of a New Emerging Era. *Journal Frontiers in Psychology, 12,* 1-12.
14. Jevremović, M., Vasić, Ž., Štrbac-Savić, S., & Staletić, N. (2017). Istraživanje uticaja digitalnog marketinga putem društvenih medija. *Informacione tehnologije, obrazovanje i preduzetništvo – ITOP17,* 185-192.
15. Kokeza, G., & Radosavljević, D. (2016). Influence of technological development on encouraging innovativeness of domestic industrial enterprises. *Ekonomika preduzeća*, *67*(7-8), 478-491.
16. Kotler, F., & Keler, K. L. (2017). *Marketing menadžment*. Data Status i Ekonomski fakultet: Beograd.
17. Krstić, N., Lalić, D., & Vujičić, D. (2017). Awareness and usage of digital marketing in Serbia. *Ekonomika preduzeća*, *65*(3-4), 306-320.
18. Lalević, N. (2022). Novi vidovi marketinga u eri digitalnih komunikacija. *Megatrend revija, 19*(1), 189-200.
19. Mahmutović, K. (2021). Digitalni marketing: strategije, alati i tehnike. Bihać: Univerzitet u Bihaću, Ekonomski fakultet.
20. Milić, N. (2020). Društvene mreže kao segment digitalnog marketinga u bankarstvu. *Trendovi u poslovanju, 16*(2), 57-69.
21. Miller, M. (2011). *The Ultimate Web Marketing Guide*. QUE Publishing – Pearson Education Inc.
22. Mitrović, K. (2020). Upotreba tehnologije virtuelne i proširene stvarnosti u marketingu. *Zbornik radova Fakulteta tehničkih nauka*, *35*(2), Novi Sad.
23. Mobile Marketing Association. (2008). *Mobile Applications*. Retrieved from http://www.mmaglobal.com/files/mobileapplications.pdf
24. Naylor, R. W., Lamberton, C. P., & West, P. M. (2012). Beyond the „Like" Button: The Impact of Mere Virtual Presence on Brand Evaluation and Purchase Intentions in Social Media Settings. *Journal of Marketing, 76,* 105–120.
25. Nielsen-Norman Group. Retrieved from http://www.nngroup.com/about/userexperience.html
26. Njegomir, V. (2020). Digitalni marketing. *CITIVAS, 10(1),* 52-71.
27. Quinton, S., & Simkin, L. (2016). The digital journey: Reflected Learnings and Emerging Challenges. *International Journal of Management Reviews*, 1-18.
28. Ravić, N., Baltezarević, R., & Radić, N. (2022). Istraživanje upotrebe digitalnog marketinga u malim i srednjim preduzećima u Republici Srbiji. *Megatrend revija*, *19*(2), 1-12.
29. Republički zavod za statistiku Republike Srbije. (2022). *Upotreba informaciono-komunikacionih tehnologija u Republici Srbiji*. Retrieved from https://publikacije.stat.gov.rs/G2022/Pdf/G202216017.pdf
30. Roto, V., & Kaasinen, E. (2008). The second international workshop on mobile internet user experience, 571-573.
31. Smith, P. R., & Chaffey, D. (2005). *eMarketing eXcellence The Heart of eBusiness* (Second edition). Oxford: Elsevier.
32. Stanić, M. (2017). *Mobilni marketing – savršen komunikacioni kanal zasnovan na interaktivnosti i dozvoli*. Retrieved from https://doisrpska.nub.rs/index.php/SNG/article/download/5774/5626
33. Steel, E. (2009). *Marketers Take Search Ads beyond Search Engines*. Wall Street Journal.
34. Veleva, S. S., & Tsvetanova, A. I. (2019). Characteristics of the digital marketing advantages and disadvantages. *IOP Conference Series: Materials Science and Engineering, 940 – DTMIS*.
35. Yang, Z., Jun, M., & Peterson, T. R. (2004). Measuring customer perceived online service quality. Scale development and managerial implications. *International Journal of Operations & Production Management*, *24*(11), 1149-1174.

Slaviša Trajković

was born on March 26, 1970, in Priština. He completed his undergraduate studies in 1994 at the Faculty of Economics, University of Priština, and his master's studies in 1998 at the Faculty of Economics and Business, University of Belgrade. He defended his doctoral dissertation titled "Expert system model for the application of the portfolio concept in the strategic management system" on August 31, 2008 at the Faculty of Economics, University of Priština in Zubin Potok. He was elected to the position of full professor at the same Faculty on July 11, 2014. He is the author and co-author of a large number of scientific works.

Srđan Milosavljević

was born on June 2, 1980 in Kosovska Mitrovica. He completed his undergraduate studies in 2006 at the Faculty of Technical Sciences, University of Priština, with temporary headquarters in Kosovska Mitrovica. He defended his doctoral dissertation titled "Performance of a wireless telecommunication system in the presence of η-μ fading" in 2017 at the Faculty of Electronics, University of Niš. He was elected to the position of associate professor in 2023 at the Faculty of Economics, University of Priština. He is the author and co-author of a large number of scientific works.

Ivana Aleksić

was born on March 12, 1997, in Kosovska Mitrovica. She completed her undergraduate studies in 2020 at the Faculty of Economics, University of Priština, with a temporary seat in Kosovska Mitrovica, achieving an average grade of 9.92. In 2021, she defended her master-s thesis at the same faculty. On April 1, 2021, she was elected as a teaching associate at the Faculty of Economics, University of Priština, and on March 12, 2023, she was elected as an assistant for the narrower scientific field of Business Economics. He is the author and co-author of a large number of scientific works.

ORIGINAL SCIENTIFIC PAPER
UDK: 004.738.5:336.794
004.42:794]:621.395.721.5
DOI: 10.5937/EKOPRE2404222T
Date of Receipt: June 20, 2023

Nenad Tomić
University of Kragujevac
Faculty of Economics
Department of Finance, Financial Institutions and Insurance

Marija Mirić
University of Kragujevac
Faculty of Economics

USING EXTENDED TAM FOR ANALYZING ADOPTION DETERMINANTS OF MICROTRANSACTIONS IN MOBILE GAMES AMONG SERBIAN GAMERS

Primena proširenog TAM modela za analizu determinanti prihvatanja mikrotransakcija u mobilnim video igrama kod igrača iz Srbije

Abstract

Microtransactions represent payments for purchasing mobile application or additional content in a video game. In contemporary conditions, most video game publishers have opted for microtransactions as a supplementary or even core business model. The market of mobile games is specific for the dominant role of microtransactions as a source of publisher's income. Due to the system differences between mobile phones and computers and gaming consoles, there are certain forms of microtransactions unique to mobile games. The aim of the research is to determine the key determinants that influence the player's decision to pay for microtransactions in mobile games. In this paper, the original TAM was expanded with variables that are specific to the video game adoption, and especially to the use of mobile platforms. The results showed that perceived enjoyment, flow of experience and mobility, that is, the specificity of mobile devices, are significant predictors of players' intention to pay for microtransactions. Also, the social component is an important variable in the model because it appears as a predictor of perceived enjoyment and flow of experience. The intention to use microtransactions has a statistically significant effect on the actual use of microtransactions.

Keywords: *microtransactions, Technology Acceptance Model, mobile games, perceived enjoyment, flow of experience*

Sažetak

Mikrotransakcije označavaju plaćanja prilikom kupovine aplikacije za mobilni telefon ili plaćanja za kupovinu dodatnog sadržaja u video igrama. U savremenim uslovima, većina izdavača video igara se odlučila za mikrotransakcije, kao dopunski ili osnovni poslovni model. Tržište mobilnih video igara specifično je po dominantnoj ulozi mikrotransakcija kao prihoda izdavača. Usled sistemskih razlika mobilnih telefona i računara i igračkih konzola, javljaju se pojedini oblici mikrotransakcija svojstveni samo mobilnim igrama. Cilj sprovedenog istraživanja je utvrđivanje ključnih determinanti koje utiču na odluku igrača o plaćanju mikrotransakcija u mobilnim igrama. Za potrebe rada, osnovni TAM model je proširen varijablama koje su specifične za industriju video igara, a naročito za korišćenje mobilnih platformi. Rezultati istraživanja pokazali su da su percipirano uživanje, tok doživljaja i mobilnost odnosno specifičnost mobilnih uređaja značajni prediktori namere igrača da plaćaju mikrotransakcije. Takođe, socijalna komponenta je značajna varijabla u modelu, jer se javlja kao prediktor percipiranog uživanje i toka doživljaja. Namera korišćenja mikrotransakcija ima statistički značajan uticaj na stvarnu upotrebu mikrotransakcija.

Ključne reči: *mikrotransakcije, TAM model, mobilne video igre, percipirano uživanje, tok događaja*

Introduction

The smartphone market is the most lucrative segment of computer equipment sales, with over 1.3 billion devices sold in 2022 [13]. Early models of mobile phones brought few and simple forms of entertainment applications, which nevertheless gained global popularity. Thus, the game "Snake" dating back to 1997 on Nokia devices became one of the most famous games of its time [4]. In addition to numerous other applications, smartphone operating systems have brought the possibility of developing complex video games. Thus, at the end of the first decade of the 21st century, the third and fastest growing segment of the video game market was created. In 2022, the mobile phone gaming market generated over 92 billion US dollars in revenue, or exactly 50% of the entire industry's revenue [8]. The specific difference in the gaming experience compared to games for PCs and consoles is due to playing on a portable device and the possibility of performing a larger number of shorter gaming sessions during the day.

Charging a one-time premium price for the purchase of a video game used to be the business model of video game publishers. Such an approach corresponded to the intermediary relationship between publisher and player, which is characteristic of the physical sale of video game through retail gaming equipment chains. Under the influence of the Internet, the business model of video game publishers has changed. The Internet provided the infrastructure for direct distribution of games to players, and it eliminated the necessity of the involvement of intermediaries such as video game distributors [32, p. 151]. It also provided the possibility of online payment, which meant that the purchased games became available instantly. Direct game distribution systems created a more direct relationship between publishers and players, where on the one hand players could more easily send feedback regarding game content, while on the other hand publishers got the opportunity to offer players additional content [31].

Purchasing additional video game content is called microtransaction both in gaming and academic literature. Since the second decade of the 21st century, most publishers have opted for microtransactions, as a supplementary or even core business model. Therefore, microtransactions have become a heterogeneous category, creating opportunities for different sales models. In popular games that are sold at a premium price, big publishers decide to sell additional content as a means of making extra profit [22, p. 424]. Small and independent development teams cannot reach enough players by selling at a premium price, so they often offer the basic game content for free. In order to make money, they rely solely on some form of microtransactions. Publishers of video games for mobile phones, as a rule, turn to microtransactions due to the partly different gaming experience compared to computer and console video games [41].

The topic of the paper is the adoption factors of microtransactions in video games for mobile phones. The aim of the research is to determine the key determinants that influence the player's decision to pay for microtransactions in mobile games. The research has been performed on the sample of mobile game players in Serbia. In this paper, the original Technology acceptance model (TAM) was expanded with variables that are specific to the video game adoption, and especially to the use of mobile platforms.

The paper is structured in three logically connected units. In the first part, the concept of microtransactions will be explained with a special focus on those types that are applied in games intended for mobile phones. In the second part, the research methodology will be explained, through the adaptation of the original TAM model. The third part of the paper will present the results of the research.

The business model of microtransactions in the segment of mobile video games

Microtransactions represent payments for purchasing mobile application or additional content in a video game [38]. The original idea was for the player to purchase some extra content at a very low cost. By diversifying the business concept, microtransactions began to denote an increasing number of different forms of in-game payments that in certain situations can be quite high, almost at the level of the premium price of a video game. The notorious example is the game Dead Space 3 [40]. That's why it can be said that this category is primarily defined by the purpose and not by the payment amount.

The first microtransactions were designed as a way to monetize mobile phone applications at the end of the first decade of the 21st century. In modern conditions, mobile applications are almost entirely funded by some form of microtransactions. One way is to offer free download of the application and use of its basic contents, while the advanced contents are charged additionally. Another approach is to offer a trial period of using the application, during which the user can familiarize himself with the possibilities, but for long-term use it is necessary to pay a subscription. In the third access, the use of the free version of the application is periodically interrupted by advertisements, so the user must pay a certain amount if he wants to use the clean version [19]. Video games offer additional opportunities for earning through the payment of microtransactions thanks to the specificity of use.

An important aspect of microtransactions is the subscription model, which is especially present in games with a strong multiplayer component [26]. In this way, publishers generate stable income over a long period of time. An alternative approach involves the sale of additional content that modifies the content of the original game (downloadable content - DLC), such as new characters, levels or game mechanics added to the existing ones. The third model includes the sale of visual accessories that do not change the game mechanics but improve the gaming experience through content customization. In gaming terminology, these contents are called *skin*s [37]. Loot boxes are also very common form of microtransactions. They represent a mysterious package, which may contain a skin, but also some improvement important for the further progress in the game [45]. Players must make a payment to be able to open the loot box, without knowing its contents in advance.

There are significant differences in the design of video games for computers and game consoles and mobile games. First of all, the difference in screen size determines a different approach to gaming. A smaller screen necessarily means lower visibility, so it is impossible to simply make a computer video game compatible with the operating systems of smart mobile phones. Instead, popular PC and console video games get their own mobile versions, which are often significantly altered from the originals. Another difference is the gameplay mechanics. Computer and console video games are usually played in long sessions that can last several hours. They are tied to the location of console or computer. Thanks to the performances of mobile devices, mobile games can be played anywhere and anytime. Game sessions are on average significantly shorter, but also much more frequent. That is why there are rarely games that require the player to spend a lot of time continuously.

Due to the aforementioned differences, certain forms of microtransactions specific to mobile games also appear. The first type are energy or stamina refills. Under the pretext of frequent short gaming sessions, publishers often resort to game design that allows the player a limited number of actions over time. This phenomenon is especially common in the variation of strategy games known as MOBA (*multiplayer online battle arena*) or games in which the player leads one hero, who is gradually improved (MMORPG - *massive multiplayer online role playing games*). In order to speed up the construction jobs and training units for the tribe/nation he manages or to increase the number of actions with the hero he leads, the player must make a time-saving purchase or an energy refill. Otherwise, he is condemned to wait for a longer period of time after the allowed moves in order to replenish the scale for new actions. An example is one of the most lucrative mobile games, *Clash of Clans*, in which the player can pay to speed up the construction of buildings in the village [16].

The next type is characteristic of so-called *free-to-play* games, i.e. games where the start of playing is free. By not charging players to download a game and start using it, publishers contract with digital advertisers, allowing them to use a built-in ad serving mechanism. Players are broadcast advertisements at regular intervals, or in cycles after certain segments of the game [1]. Players have the option to remove ads from the video game for a one-time fee, so they can continue playing without interruption [27]. The next type of microtransactions is also characteristic of the same type of games. Namely, the design of the game can be such that it slows down the player's progress after a certain point, requiring more and more time to achieve new goals. Most often, it is not

about tasks that are complicated in themselves, but about monotonous repetition of the same actions, which does not contribute to the gaming experience. A player can use microtransactions to speed up their progress through the game, achieving more than non-paying players in less time and effort. Games designed in this way are called *pay-to-win* games. The problem is that multiplayer games create an imbalance that favors players who spend money. A negative example is *Diablo Immortal*, the first mobile game from the famous Diablo franchise, whose aggressive microtransactions system completely favors players who spend money [9]. This form of microtransactions can also occur in some form in computer video games, when players use microtransactions to buy better equipment and weapons, which gives them an advantage over other players. However, the acceleration of progress through the game is characteristic of mobile games.

Taking into account the previously stated claim, that mobile games are predominantly financed by microtransactions, as well as their presented types, it can be concluded that this segment of the video game market is more burdened by subsequent payments than computer and console games. Therefore, analyzing the factors that influence players to pay for microtransactions in mobile games is of great importance. In the following segment, an overview of previous research and a research model will be formulated.

Research model

Previous research

TAM is the dominant model in the analysis of factors influencing video game play. There are many studies in which a more or less adapted model was used. On this occasion, additional variables are introduced into the model, which are used to more precisely determine the driving factors for certain aspects of video games. By reviewing the literature, it is possible to identify a group of variables that show statistical significance in a large number of studies.

Wang & Goh [44] analyzed more than 50 academic papers on the topic of video games in which the TAM was applied and concluded that in most of them perceived enjoyment is statistically significant added variable. Chauhan et al. [11] found a statistically significant influence of perceived enjoyment and the social component for the acceptance of mobile games. Linares, Gallego & Bueno [30] proved the statistical significance of perceived enjoyment and the flow of experience in multiplayer mobile games. Kaltum, Rimadina & Zusnita [25] analyzed the factors of the acceptance of mobile games in Indonesia by applying the extended TAM, concluding that in addition to the basic variables, the flow of experience is also statistically significant. Chen et al. [12] concluded, using the example of players from China, that the social component affects perceived enjoyment, which further affects perceived usefulness and the flow of experience. The research by Jiang, Peng & Liu [23] is particularly interesting for three reasons. The first is to use a different name for the pleasure-related variable, calling it perceived entertainment. Another reason is the introduction of the variable financial costs, whose statistical significance confirms the hypothesis that increased expenses associated with a mobile game lead to a decrease in players' willingness to play it. The third reason is the introduction of a variable related to the technical capabilities of mobile phones.

Technology acceptance model

The analysis of predictors of video game acceptance is most often performed using the basic or extended TAM. In the original model defined by Davis [14], the user accepts a new technology based on perceived ease of use and perceived usefulness. Perceived ease of use reflects an individual's belief that he will be able to use a certain technology without mental and physical effort, while perceived usefulness represents the degree to which an individual believes that using a certain technology will improve his work performance [14]. From these two variables comes the behavioral intention to use, based on which the actual use of a certain technology is predicted. Basically, perceived ease of use and perceived usefulness represent cognitive responses of users to certain external factors that initiate the process of accepting a new technology [15].

The conventional TAM has been repeatedly revised, expanded and reduced in order to achieve internal

consistency and validity of the model. The original TAM essentially represents a cause-and-effect link between belief, attitude, intention, and behavior [12]. Namely, in the initial version of the model, perceived ease of use and perceived usefulness form the user's attitude towards the use of a certain technology, which further implies the intention of use. However, some studies contested the mediating influence of attitude between cognitive responses and intention to use, which is why it was excluded from the model in further modifications. Also, in the original model, perceived ease of use appears as a predictor of perceived usefulness, i.e., if a potential user perceives a new technology as easy to use, he is likely to consider it useful, which creates preconditions for its acceptance and possible use. However, subsequent research has shown that perceived ease of use is not a necessary predictor of perceived usefulness [43], [5].

Thanks to its simplicity, the TAM has found application in numerous studies dealing with user acceptance of mobile or video games [21], [30]. It is explained by the theory of planned behavior that assesses the consumer's interest or intention to take a certain action or manifest some behavior [17]. The TAM is constructed to shed light on how and why users adopt new technology, making it suitable for analyzing the factors that precede the purchase of loot boxes or other microtransactions in mobile games. In addition, traditional TAM is focused on extrinsic motivators for participating in microtransactions in video games, which is why it is often enriched with new variables that authors seek to assess the intrinsic factors that motivate players to purchase loot boxes [21]. Thus, the conventional TAM model explains the process of accepting a new technology through the action of extrinsic motivators, such as perceived simplicity and usefulness reflected in better performance. However, mobile games are also influenced by intrinsic motivators, such as social cohesion, social influence or perceived enjoyment.

Model modification

Taking into account the original TAM and previous research, it was concluded that it is necessary to introduce additional variables. The extended model is more capable of capturing all the driving forces that motivate players to use microtransactions. One of the key changes is the replacement of the model's standard variable, perceived usefulness, with a new variable, perceived enjoyment. The purpose of video games is entertainment, not utility or performance enhancement. This claim is particularly evident in the case of microtransactions because it is difficult to talk about any other kind of benefit other than the feeling of joy. A large number of studies have made an identical substitution [2], [3], [20], [30], [36].

Perceived ease of use. In accordance with the standard TAM model presented earlier, perceived ease of use appears as a predictor of perceived enjoyment and intention to use microtransactions. Lee & Tsai [29], Park et al. [36], and Matute-Vallejo & Melero-Polo [33] proved the positive influence of perceived ease of use on perceived enjoyment and tendency to play online video games. The following research hypotheses were proposed:

H1: Perceived ease of use significantly affects perceived enjoyment.

H2: Perceived ease of use significantly affects intention to use microtransactions.

Social interaction. Interaction between players is considered one of the key success factors of the video game industry (Martey & Stromer-Galley, 2007). Although there are a significant number of single-player games sold in large numbers whose popularity is timeless, multiplayer games allow for social interaction and have a better predisposition for longevity. One aspect of the social interaction of players is the ability to expand the context of socializing and cooperation outside the world of the video game [28]. Another aspect concerns the increased degree of competitiveness between players, whether it is those who cooperate during the game (say, members of the same clan in multiplayer games), or players who belong to opposing factions. In either case, there is an increased likelihood that the player will resort to microtransactions. Through payment, players can diversify and make themselves unique compared to the mass of other players (cosmetic microtransactions) or gain a competitive advantage over them (purchase of enhancements). The social aspect of gaming enhances the sense of satisfaction from consuming video games [11] and allows players to immerse themselves in the

virtual world [3], [29]. Therefore, the following research hypotheses were proposed:

H3: Social interaction significantly affects perceived enjoyment.

H4: Social interaction significantly affects flow of experience.

Perceived enjoyment. As a product of the entertainment industry, the key to the success of a video game is the sense of enjoyment that its consumption creates in the player. Based on the mentioned forms of microtransactions in the previous chapter, it can be concluded that their existence represents an obstacle or a limiting factor for the full enjoyment of users. Creating a unique player avatar through cosmetic microtransactions, speeding up gameplay through time-saving purchases, or purchasing enhancements for more competitive gameplay can enhance gaming enjoyment for different types of players. There are a number of studies that emphasize the importance of perceived enjoyment in all aspects of video game consumption on the flow of experience and the tendency to play video games [12], [18], [33], [35].

H5: Perceived enjoyment significantly affects flow of experience.

H6: Perceived enjoyment significantly affects intention to use microtransactions.

Flow of experience. When players indulge in the flow of a video game, they can often experience complete immersion in the virtual world [34]. Depending on the degree of their involvement and the depth of immersion, the players detach themselves from the virtual reality more easily or with difficulty [20]. If by paying microtransactions the player can prolong or deepen the state of immersion, there is a high probability that they will resort to payment. A large number of studies have included this variable identifying its positive influence on the intention to use microtransactions [2], [3], [25], [30].

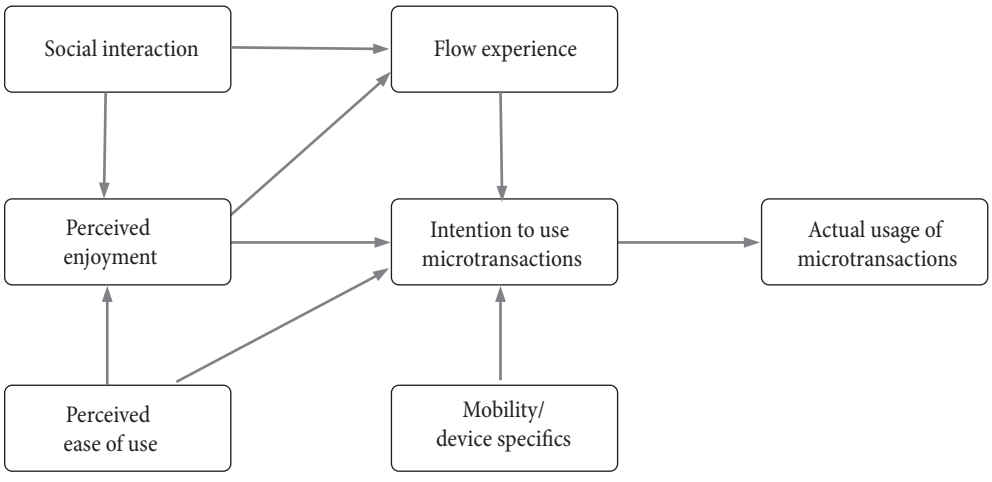
H7: Flow of experience significantly affects intention to use microtransactions.

Mobility/device specifics. As devices, mobile phones offer clear advantages over other computing systems. Operating systems enable the automation of the largest number of activities, which now take place "with a click", which eliminates the need for step-by-step logging in and partial use of functions present in computers. Mobile games are played in short sessions, they start quickly, and they are easy to stop, so microtransaction systems are fast and intuitive. Therefore, the assumption is that the design of the device itself and the mobility feature can be a significant incentive for a player to use microtransactions. Zhao et al. [46] first introduce this variable, while it is elaborated by Jiang, Peng & Liu [23], using it as a direct predictor of intention to use microtransactions.

H8: Mobility/device specifics significantly affect intention to use microtransactions.

Intention to use microtransactions. According to the original TAM, the intention to use a new technology is considered a key predictor of its actual use. The entire model rests on the statistical significance of the relationship between these two variables. If intention to use microtransactions does not cause their actual use,

Figure 1: Modified TAM



Source: Authors

then none of its predictors have specific significance in the model. Starting from the introduction of model, there is a long line of research that points to the causality of belief-intention-behavior links in the context of the use of technological products or services [14]. Therefore, the following hypothesis is proposed:

H9: Intention to use microtransactions significantly affects actual usage of microtransactions.

Figure 1 shows the modified TAM used in this research.

Empirical research

Methodology

The basic methodological tool used in the paper is structural equation modeling (SEM). The main advantage of the SEM methodology is the possibility of examining the intensity of influence between variables, in a model that predicts that certain variables are both dependent and independent. Such variables are called mediators and are essential for the viability of the model.

The players' views were expressed in the form of a questionnaire, which could be accessed at the beginning of September 2023 through a link posted on the domestic gaming forum. Players answered 21 questions related to their motives for using microtransactions using a Likert scale. A five-point scale was used. In addition to this part of the questionnaire, players also provided their demographic information and answered a question about their previous experience with microtransactions in mobile games. Only the questionnaires of players who made at least one payment within the mobile game were taken into account, a total of 198 of them. Table 1 presents the structure of the players who participated in the survey.

In order to confirm the validity of the statements made in the questionnaire, initial testing was performed on a small sample. The goal was to examine the precision of statements by calculating Crombach's alpha coefficient. The test showed satisfactory validity, as the Crombach's alpha values were above the threshold value of 0.70, so the reception of answers continued [39]. Crombach's alpha values for all variables can be seen in Table 2, along with

Table 2: Values of descriptive statistics and Crombach's alpha test

Variables	Mean	Standard deviation	Crombach's alpha
Perceived ease of use	3.753	0.902	0.818
Perceived enjoyment	3.652	0.881	0.833
Social interaction	3.604	0.929	0.765
Flow of experience	3.286	0.975	0.744
Mobility/device specifics	3.859	0.901	0.749
Intention to use microtransactions	3.960	1.071	0.895
Actual usage of microtransactions	4.136	1.101	0.914

Source: Authors based on research

Table 1: Structure of players

Category	Responses	Observations	Frequency
Gender	Male	175	88.38%
	Female	23	11.62%
Age	18-25	71	35.86%
	26-35	40	20.20%
	36-45	41	20.71%
	45+	46	23.23%
Education	High school	61	30.80%
	Student	48	24.24%
	Bachelor's degree	75	37.88%
	Master's or PhD degree	14	7.07%
Frequency of using microtransactions	Once in lifetime	61	30.80%
	At least once a month	87	43.94%
	At least once a week	45	22.73%
	More than one time per week	5	2.53%
Operational system	Android	159	80.30%
	iOS	39	19.70%
Mobile phone primary gaming device	Yes	78	39.40%
	No	120	60.60%

Source: Authors based on questionnaire

descriptive statistics. After calculating these indicators in the SPSS 22 software package, the analysis was continued in the Amos 23 software package.

Results

Table 3 shows the fit indicators. In addition to the basic indicator, the quotient of statistics χ^2 and the number of degrees of freedom, another four are included, particularly NFI, CFI, GFI and SRMR. The value of χ^2/df indicator is slightly above its upper limit, which is not a rare situation in this kind of research. The problem is that its value tends to increase as the number of observations increases [42], therefore, with large samples, the condition is almost never met. The four remaining indicators show a good fit of the model, while the SRMR meets even a more rigorous criterion.

Table 3: Fit indices of the model

Indicators	Values	Values of fit	Fit
χ^2/df	9.73	< 5(3), [10]	No
NFI	0.919	> 0.90, [7]	Yes
CFI	0.926	> 0.90, [6]	Yes
GFI	0.902	> 0.90, [24]	Yes
SRMR	0.080	< 0.10(0.08), [6]	Yes

Source: Authors based on research

Table 4 presents the results of model testing. Each row shows one path, the relationship between a pair of variables and refers to one of the formulated hypotheses. The coefficient indicates the intensity of the relationship, while the p-value indicates statistical significance. A lower p-value suggests statistical significance at a higher confidence level. A p-value lower than 0.001, i.e. confidence higher than 99.9%, is marked with asterisks.

The analysis confirmed the statistical significance of all variables included in the model. *Social interaction* emerged as a statistically significant predictor of *perceived enjoyment* and *flow of experience*. *Perceived ease of use* also has a significant impact on *perceived enjoyment*, which significantly affects *flow of experience*. The confidence level for all obtained results is higher than 99%. Regarding *intention to use microtransactions* as a mediator, the statistical significance of *perceived enjoyment*, *flow of experience* and *mobility/device specificity* was confirmed. *Perceived enjoyment* has the highest intensity of influence of all predictors, while *perceived ease of use* does not have a significant effect on intention to use microtransactions. Finally *intention to use microtransactions* emerges as a strong predictor of *actual usage of microtransactions*. An

Table 4: Analysis of significance of path coefficients

Exogenous variables	Endogenous variables	Coef.	S.G.	p-value
Perceived ease of use	Perceived enjoyment	0.585	0.053	****
Social interaction	Perceived enjoyment	0.267	0.052	****
Social interaction	Flow of experience	0.550	0.076	****
Perceived enjoyment	Flow of experience	0.231	0.080	0.004
Perceived ease of use	Intention to use microtransactions	0.027	0.086	0.754
Perceived enjoyment	Intention to use microtransactions	0.513	0.084	****
Flow of experience	Intention to use microtransactions	0.330	0.054	****
Mobility/device specifics	Intention to use microtransactions	0.229	0.065	****
Intention to use microtrans.	Actual usage of microtransactions	0.844	0.043	****

Source: Authors based on research
**** - statistical significance for p < 0.001

Table 5: Status of hypotheses

Hypotheses	Correlation	Outcome
H1	Perceived ease of use – Perceived enjoyment	Supported
H2	Social interaction – Perceived enjoyment	Supported
H3	Social interaction – Flow of experience	Supported
H4	Perceived enjoyment – Flow of experience	Supported
H5	Perceived ease of use – Intention to use microtransactions	*Unsupported*
H6	Perceived enjoyment – Intention to use microtransactions	Supported
H7	Flow of experience – Intention to use microtransactions	Supported
H8	Mobility/device specifics – Intention to use microtransactions	Supported
H9	Intention to use microtran. – Actual usage of microtransactions	Supported

Source: Authors based on research

overview of the confirmation of the hypotheses is given in Table 5.

Based on Table 5, it can be concluded that the claim about the significant influence of perceived ease of use on the intention to use microtransactions is the only unconfirmed hypothesis. Perceived enjoyment and flow of experience are of great importance to the model, as they translate the impact of their predictors on intention to use microtransactions. Also, the social component is a significant variable in the model because it appears as a predictor of both perceived enjoyment and flow of experience.

Conclusion

Based on the research, it can be concluded that TAM is a good basis for developing a complex model that explains decision-making about the use of microtransactions in mobile games. The model used is complex, because it requires the monitoring of a large number of variables that appear as mediators. Perceived enjoyment and flow of experience proved to be the central variables of this model because their importance in the model is the crucial for the role of perceived ease of use and social interaction. The statistical significance of their impact on the intention to use microtransactions is accompanied by high coefficient values, which gives special importance to the model. In addition, these two variables are themselves interrelated. The positive contribution of the variable related to the specifics of the mobile device should also be emphasized. While the previous two variables are regularly found in mobile video game research, the device-specific variable is seldom included. Research has shown that the nature of the device greatly contributes to players' intention to use microtransactions. This is completely understandable given the theoretical considerations from the first part of the paper, on the topic of specific forms of microtransactions developed especially for mobile games. Perceived ease of use has no statistically significant effect on the intention to use microtransactions. A partial explanation is that the difficulty of performing microtransactions is so trivial that it can hardly be a deterrent. Therefore, in this model, the variable does not have that relative importance in relation to other variables, which it has in the original TAM.

Although the model showed a good fit and supported a significant number of hypotheses, there is still room for improvement. The following researches on this topic should enable the comparison of the obtained results. One aspect could be to compare the results from Serbia with results from another country, preferably with a different gaming culture. Another aspect may be platform-based, comparing research on the use of microtransactions in mobile games and PC/console video games.

The key limitation of the research is the size of the mobile game market in Serbia. Although globally this market has significantly surpassed the PC video games market, in Serbia the number of mobile game players is still significantly lower than the number of PC games players, as can be seen in the questionnaire. Certainly, the video games market in Serbia does not have a different trend but is only a few years behind the global market. Mobile games are also a rapidly growing segment of the market in Serbia, so they will inevitably become its dominant part in the coming period.

References

1. Abaev, B. (2021, November 30). The Game Ecosystem As A Unique And Effective Ad Platform, *Forbes*, Retrieved from https://www.forbes.com/sites/forbestechcouncil/2021/11/30/the-game-ecosystem-as-a-unique-and-effective-ad-platform/?sh=5f3996da5b86
2. Agag, G., Khashan, M. A., & Elgayaar, M. (2019). Understanding online gamers' intentions to play games online and effects on their loyalty: An integration of IDT, TAM and TPB. *Journal of Customer Behavior, 18*(2), 101-130. https://doi.org/10.1362/147539219X15633616548597
3. Alzahrani, A.I., Mahmud, I., Ramayah, T., Alfarraj, O., & Alalwan, N. (2017). Extending the theory of planned behavior (TPB) to explain online game playing among Malaysian undergraduate students. *Telematics and Informatics*, *34*(4), 239-251. https://doi.org/10.1016/j.tele.2016.07.001
4. Angelos, A. (2021, February 23). The history of Snake: How the Nokia game defined a new era for the mobile industry. *It's nice that*. Retrieved from https://www.itsnicethat.com/features/taneli-armanto-the-history-of-snake-design-legacies-230221
5. Averweg, R.U. (2008). Information technology acceptance in South Africa: An investigation of perceived usefulness, perceived ease of use and actual system use construct. *African Journal of Information Systems, 1*(1), 44–66.
6. Bentler, P. M. (1995). *EQS Structural equation program manual*. Multivariate software, Encino, California, USA.

7. Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structure. *Psychological Bulletin,* 88(3), 588-606. https://doi.org/10.1037/0033-2909.88.3.588
8. Bradshaw, T., & Gross, A. (2022, December 15). Mobile games market to decline for first time in over a decade, *Financial Times*. Retrieved from https://www.ft.com/content/395ebc6d-4b0c-4e66-903d-5b64a95649a3
9. Byrd, M. (2022, June 1). Diablo Immortal Microtransactions Explained: Is It a Pay-to-Win Game? *Denofgeek.com*. Retrieved from https://www.denofgeek.com/games/diablo-immortal-every-microtransaction-explained-battle-pass-loot-box-pay-to-win/
10. Carmines, E. G., McIver, J. P. (1983). An Introduction to the Analysis of Models with Unobserved Variables. *Political Methodology – Special issue on modelling 9*(1), 51-102.
11. Chauhan, S., Mittal, M., Woznikak, M., Gupta, S., & de Prado, R. P. (2021). A Technology Acceptance Model-Based Analytics for Online Mobile Games Using Machine Learning Techniques. *Symmetry*, *13*(8), 1545. https://doi.org/10.3390/sym13081545
12. Chen, H., Rong, W., Ma, X., Qu, Y., & Xiong, Z. (2017). An Extended Technology Acceptance Model for Mobile Social Gaming Service Popularity Analysis. *Mobile information systems,* (3), 1-12 https://doi.org/10.1155/2017/3906953
13. Counterpointreserach.com (2023). Global Smartphone Shipments Market Data (Q2 2021 – Q1 2023), Retrieved from https://www.counterpointresearch.com/global-smartphone-share/
14. Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319-340. https://doi:10.2307/249008
15. Davis, F.D. (1993). User acceptance of information technology: system characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, *38*(3), 475-487. https://doi.org/10.1006/imms.1993.1022
16. Defonteny, T. (2023, June 13). Best and worst ways to spend gems in clash of clans, *Highgroundgaming.com*. Retrieved from https://www.highgroundgaming.com/clash-of-clans-best-way-spend-gems/
17. Friadi, H., Sumarwan, U., & Kirbrandoko. (2016). Integration of Technology Acceptance Model and Theory of Planned Behaviour of Intention to Use Electronic Money. *International Journal of Science and Research (IJSR)*, *7*(2), 711-716. https://doi.org/10.21275/ART201890
18. Ha, I., Yoon, Y., & Choi, M. (2007). Determinants of adoption of mobile games under mobile broadband wireless access environment. Information & Management, 44(3), 276-286. https://doi.org/10.1016/j.im.2007.01.001
19. Hof, R. (2015, July 9). Why Most People Won't Pay To Block Mobile Ads, *Forbes*. Retrieved from https://www.forbes.com/sites/roberthof/2015/07/09/would-you-pay-to-block-mobile-ads-no-most-of-you-would-not/?sh=7f6a7d6372df
20. Hsiao, K.-L., & Chen, C.-C. (2016). What drives in-app purchase intention for mobile games? An examination of perceived values and loyalty. *Electronic Commerce Research and Applications*, *16*(March), 18-29. https://doi.org/10.1016/j.elerap.2016.01.001
21. Hsu, C.L., & Lu, H.P. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience, *Information & Management*, *41*(7), 853–868. https://doi.org/10.1016/j.im.2003.08.014
22. Ivanov, M., Wittenzellner, H., & Wardaszko, M. (2019). Video games monetization mechanism in AAA video games, in: Wardaszko, M. (ed.) *Simulation and gaming*, ISAGA
23. Jiang, G., Peng, L., & Liu, R. (2015). Mobile Game Adoption in China: the Role of TAM and Perceived Entertainment, Cost, Similarity and Brand Trust. *International Journal of Hybrid Information Technology*, *8*(4), 212-232. http://dx.doi.org/10.14257ijhit.2015.8.4.24
24. Jöreskog, K. G., Sörbom, D. (1986). *LISREL VI: Analysis of linear structural relationships by maximum likelihood and least square methods*. Scientific Software, Mooresville, Indiana, USA.
25. Kaltum, U., Rimadina, R., & Zusnita W. (2018). The TECHNOLOGY Acceptance Model for Playing Mobile Games in Indonesia, *KnE Social Sciences,* doi:10.18502/kss.v3i10.3445
26. Klimas, P. (2017). Current revenue (monetisation) models of video game developers. *Journal of Management and Financial Sciences, 10*(28), 119-136. Conference proceeding, Warsaw: Kozminski University.
27. Kosovac, D. (2023). Runner. *Svet kompjutera*, *39*(7), 67.
28. Laurel, B. (2013). *Computers as theatre*. 2nd edition. Boston, MA: Addison-Wesley.
29. Lee, M.C., & Tsai, T.R. (2010). What Drives People to Continue to Play OnlineGames? An Extension of Technology Model and Theory of Planned Behavior. *International Journal of Human-Computer Interaction*, *26*(6), 601-620. https://doi.org/10.1080/10447311003781318
30. Linares, M., Gallego, M.D., & Buesno, S. (2021). Proposing a TAM-SDT-Based Model to Examine the User Acceptance of Massively Multiplayer Online Games. *International Journal of Environmental Research and Public Health*, *18*(7), 3687.
31. Lin, D., Bezemer, C.P., Zou, Y., & Hassan, A.E. (2019). An Empirical Study of Game Reviews on the Steam Platform. *Empirical software engineering*, *24*(1), 170-207. doi:10.1007/s10664-018-9627-4
32. Marchand, A., & Henning-Thurau, T. (2013). Value Creation in the Video Game Industry: Industry Economics, Consumer Benefits, and Research Opportunities. *Journal of interactive marketing*, *27*(3), 141-157. https://doi.org/10.1016/j.intmar.2013.05.001
33. Matute-Vallejo, J., & Melero-Polo, I. (2019). Understanding online business simulation games: The role of flow experience, perceived enjoyment and personal innovativeness. *Australasian Journal of Educational Technology 35*(3), 71-85. https://doi.org/10.14742/ajet.3862
34. Merhi, M.I. (2016). Towards a framework for online game adoption. *Computers in Human Behavior*, *60*(July), 253-263. https://doi.org/10.1016/j.chb.2016.02.072
35. Moulard, J.G., Kroff, M., Pounders, K., & Ditt, C. (2019). The Role of Suspense in Gaming: Inducing Consumers' Game Enjoyment. *Journal of Interactive. Advertising, 19*(3), 219-235. https://doi.org/10.1080/15252019.2019.1689208
36. Park, E., Baek, S., Ohm, J., & Chang, H.J. (2014). Determinants of player acceptance of mobile social network games: An application of extended technology acceptance model. *Telematics and Informatics*, *31*(1), 3-15. https://doi.org/10.1016/j.tele.2013.07.001
37. Reza, A., Chu, S., Nedd, A., & Gardner, D. (2022). Having skin in the game: How players purchase representation in games. *Convergence*, *28*(6), 1621-1642. https://doi.org/10.1177/13548565221099713

38. Statt, N. (2013, December 19). Micropayments, mega angst, and the future of console games. *CNet*. Retrieved from https://www.cnet.com/tech/services-and-software/micropayments-mega-angst-and-the-future-of-console-games/
39. Taber, K.S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education, 48*, 1273-1296.
40. Tassi, P. (2013, January 30). Is $50 Worth of Dead Space 3 DLC Still a 'Microtransaction'?, *Forbes*. Retrieved from https://www.forbes.com/sites/insertcoin/2013/01/30/is-50-worth-of-dead-space-3-dlc-still-a-microtransaction/?sh=67b93f923a86
41. Valadares, J. (2011, July 7). Free-to-play Revenue Overtakes Premium Revenue in the App Store. *Flurry*. Retrieved from https://web.archive.org/web/20110810132946/http://blog.flurry.com/bid/65656/Free-to-play-Revenue-Overtakes-Premium-Revenue-in-the-App-Store
42. Vandenberg, R. J. (2006). Statistical and Methodological Myths and Urban Legends, *Organizational Research Methods*, 9(2), 194-201.
43. Venkatesh, V., & Davis, F.D. (2000). A theoretical extension of the Technology Acceptance Model: Four longitudinal field studies. *Management Science*, *46*(2), 186-204. https://doi.org/10.1287/mnsc
44. Wang, X., & Goh, D.H. (2017). Video Game Acceptance: A Meta-Analysis of the Extended Technology Acceptance Model. *Cyberpsychology, behavior and social networking*, *20*(11), 662-671. https://doi:10.1089/cyber.2017.0086
45. Xiao, L.Y. (2021). Regulating loot boxes as gambling? Towards a combined legal and self-regulatory consumer protection approach. *Interactive Entertainment Law Review*, *4*(1), 27-47.
46. Zhao, L., Lu Y., Wang, B., Chau, P.Y.K., & Zhang, L. (2012). Cultivating the Sense of Belonging and Motivating User Participation in Virtual Communities: A Social Capital Perspective. *International Journal of Information Management*, *32*(6), 574-588. https://doi.org/10.1016/j.ijinfomgt.2012.02.006

Nenad Tomić

is an associate professor at the Faculty of Economics, University of Kragujevac. He completed his PhD thesis, titled "Valorization of electronic payment systems for the improvement of payment transactions" in October 2018. He is the author of more than 40 scientific articles, papers in monographs and statements at conferences. The main areas of scientific interest are electronic payments in general, particularly cryptocurrencies and microtransactions, and event study analysis on financial markets.

Marija Mirić

is a junior research assistant at the Faculty of Economics, University of Kragujevac. She holds a master's degree in International Management. Currently, she is a third-year Ph.D. student with an approved thesis application titled "Sustainable Human Resource Management: Strategic and Operational Aspect". She authored many journal articles and conference papers. Her main areas of research interest are human resource management and organizational behavior.

ORIGINAL SCIENTIFIC PAPER
UDK: 338.482:159.942.52
005.336.3:[338.48-6:641/642(497.11)
DOI: 10.5937/EKOPRE2404233Y
Date of Receipt: November 18, 2023

Miloš Zrnić
Academy of Applied Studies Belgrade
College of Hotel Management

Ivana Lončar
Academy of Applied Studies Belgrade
College of Hotel Management

ENHANCING GUEST SATISFACTION IN HOTELS: RESEARCHING THE IMPACT OF QUALITY HOSPITALITY SERVICE ON GASTRONOMIC EXPERIENCES IN THE TOURISM INDUSTRY IN SERBIA

Povećanje zadovoljstva gostiju u hotelima – istraživanje uticaja kvalitetne ugostiteljske usluge na gastronomska iskustva u turističkoj industriji u Srbiji

Abstract

This study delves into the influence of quality hospitality service on gastronomic experiences in the tourism industry in Serbia. Through a comprehensive analysis of guest satisfaction in hotels, particularly focusing on the impact of service staff expertise and gastronomic offerings, valuable insights were gained. The research involved 440 respondents from 4* and 5* hotels; data were collected using an online questionnaire and analyzed using SPSS 22 software. By employing quantitative and qualitative methods, the study explored factors such as guest satisfaction and service quality. The findings revealed a significant correlation between the level of knowledge, training, and specialization of hotel service staff and the quality of service provided. Ultimately, the study underscores the importance of enhancing guest satisfaction through a holistic approach to hospitality service, emphasizing the pivotal role of gastronomic experiences in shaping overall guest perceptions and loyalty.

Keywords: *quality service, guests, satisfaction, hospitality service, gastronomic experience, tourism industry, Serbia*

Sažetak

Ova studija bavi se uticajem kvalitetne ugostiteljske usluge na gastronomska iskustva u turističkoj industriji Srbije. Kroz sveobuhvatnu analizu zadovoljstva gostiju u hotelima, sa posebnim osvrtom na uticaj stručnosti uslužnog osoblja i gastronomske ponude, stekli su se značajni uvidi. U istraživanju je učestvovalo 440 ispitanika iz hotela sa 4* i 5*; podaci su prikupljeni pomoću online upitnika i analizirani pomoću softvera SPSS 22. Koristeći kvantitativne i kvalitativne metode, studija je istraživala faktore kao što su zadovoljstvo gostiju i kvalitet usluge. Nalazi su otkrili značajnu korelaciju između nivoa znanja, obuke i specijalizacije hotelskog uslužnog osoblja i kvaliteta pružene usluge. Na kraju, studija naglašava važnost povećanja zadovoljstva gostiju kroz holistički pristup ugostiteljskim uslugama, naglašavajući ključnu ulogu gastronomskih iskustava u oblikovanju ukupne percepcije i lojalnosti gostiju.

Ključne reči: *kvalitetna usluga, gosti, zadovoljstvo, gostoprimstvo, gastronomsko iskustvo, turistička industrija, Srbija*

Introduction

Tourism represents one of the largest global industries and makes a great contribution to the economies of the most developed and developing countries, as it is used as a tool for economic progress, diversification at the domestic, regional and national level. Every tourism organization should clearly identify its target market and prepare to meet the needs of that market, ensuring that all employees understand and are committed to constantly and regularly meeting the demands of their guests. For this reason, catering facilities (hotels, restaurants, etc.) should improve the quality of products and/or services in order to increase guest satisfaction. Guest satisfaction is a key issue for the survival of catering establishments. Quality in tourism cannot be viewed individually from the point of view of intangibility, heterogeneity, work intensity, cost structure, but also from the point of view of other aspects, i.e. provider of services (established standards, defined norms, technical and technological elements) satisfaction of tourists' wishes and needs. Today's guests visit destinations that best reflect their needs, desires, goals, and motives. In this way, they can get to know local customs, culture, character of the destination, explore the gastronomy, in one word "the quality of the destination". The challenge that arises in relation to quality in tourism is how to improve the overall value of the tourist offer (service-product). Therefore, in order to achieve satisfaction, tourism organizations should focus more on service quality, identifying guest expectations as well as planning methods that can be used to meet such expectations because satisfaction leads to loyalty and retention.

Empirical research by [47] conducted in Serbia in 2012 indicates that guest loyalty stems primarily from product/service quality. Additionally, the same author states that quality service is the end result of the service process, which is attributed to enthusiastic employees and management. In his research on the quality of products/services in Serbia, [38] claims that the tourist offer is inadequate due to the fact that the offer does not follow the demand and that the price and product/service ratio is inadequate. In addition, the same author adds that quality improvement can greatly help to strengthen tourism, guest satisfaction, further development of tourist offer (products/services), maintenance of natural resources and positive effects on the economic growth of Serbia.

Various empirical studies have established that the quality of tourism services gives a seal to the destination image [52], [49], [39]. Quality in tourism is built, maintained and improved for years, and it loses very quickly if sufficient attention, time and work are not given to it.

In order to establish, maintain and improve quality, it is extremely important that employees and management in the tourism sector are informed and involved in the process of creating a quality tourist offer (products/services) and are fully aware that their skills, knowledge and commitment are of crucial importance for building the foundation of quality in tourism [6], [28]. In this way, there is a high probability that quality will be maintained and contribute to the satisfaction of guests on the one hand and the success of tourism organizations on the other hand [3]. It is certain that the business of tourist organizations today requires the conformity of the quality of tourist products and services. Understanding the quality of tourism service and its dimensions will improve the effectiveness of the organization and its position in the market [9].

Ensuring continuous quality, reliability, empathy and sustainability improves the destination's image on the global tourism map. Additional research also finds a positive relationship between tourism service quality dimensions and image [51]. With an increasing role of tourism in the overall economy and growing competition on the global tourism market, the importance of developing quality tourism products has been recognized by both the public and private tourism sectors. In order to contribute to the development of quality-based tourism, today's organizations must know what their competitive advantage is and what capabilities they need to grow and maintain it, especially considering the higher levels of guest expectations related to environmental and aesthetic aspects and the overall experience [55].

Quality-based tourism can contribute to the sustainable development of the country by improving the competitiveness of enterprises, meeting social needs and preserving the cultural and natural environment

[21]. The quality of services related to tourism, as well as services in general, is basically balancing the perception and expectations of guests. Successful service providers should, whenever possible, exceed guest expectations. For example, if travel agencies do not meet the expectations of tourists, dissatisfaction will arise, and tourists will not return to such agencies [7].

Guest satisfaction must be a priority in quality assessment, and the service provider must fully understand the product attributes that meet the guests' requirements in terms of product specifications [34]. Quality is the key to competitiveness, survival and business success [22]. However, what should be accepted as a fact is that the quality of the tourist offer cannot exist only in tourist intervals/seasons. Quality in tourism must be appropriate and consistent.

The goal of maintaining quality in tourism, hospitality, and cuisine includes fulfilling the needs of the end user, or guest, as well as the experience, guest satisfaction, and the value of the stipulated price of services and products. Furthermore, the cornerstone of tourist services in attaining guest pleasure is quality.

Based on previous statements, the following hypotheses were put forward:

H1: The quality of the hotel's hospitality facilities (restaurant, cafe bar, lounge bar, etc.) depends on the level of knowledge, training, and specialization of the hotel's service staff and affects guest satisfaction.

H2: The gastronomic experience of the prepared meals and drinks depends on the expertise of the service staff (cooks, waiters, management) and affects the overall satisfaction of the guests.

Literature review

Hotel management, as a part of the hospitality industry, represents a hospitality base that includes food, beverage, wellness, and accommodation services (hotels, hostels, resorts, camps, apartments, villas, cottages). As a service activity and an integral part of tourism, the hotel industry represents a significant element of the rapid socio-economic progress of many countries [10], [11].

Hotel management along with other service activities (food, drinks, events, sports, etc.) represents the financial strength of a tourist destination [25], [42]. Quality is often mentioned in the hotel industry, which is an indispensable, integral part of the services and products provided by hotel companies [53]. Quality management in hotel companies is always a big challenge [46] and its improvement is one of the main goals of hotel business [33]. The concept of quality is widely present in hotel business because the word quality is used as a marketing tool aimed at guests and in standard manuals intended for staff [56].

Hotels that adopt consistently effective quality systems achieve potential benefits, such as: maximizing guest satisfaction, employee satisfaction and margins; reduction of costs; better utilization of resources compared to competitors who do not pay attention to quality [44]. Hotels and their food and beverage sectors are key components of the hospitality industry, so ensuring the quality of their tangible and intangible aspects is a key issue for maximizing guest satisfaction and increasing hotel revenue. Thus, quality affects the economic performance of hotels [14]. Hotel establishments are witnessing increasing competition in the context of high-quality service and guest satisfaction [26]. Moreover, the authors [45] state that hotel organizations must better and more precisely understand what guests want from the service experience because this knowledge allows them to minimize the waste of resources.

High-quality goods and services can give a hotel a competitive advantage. The reputation of a high-quality facility generates a satisfied and loyal guest, who rewards the hotel with repeat visits and promotion, which additionally results in the arrival of new guests. On the contrary [31], inadequate establishment and maintenance of quality can be harmful, and for this very reason, hotel companies must pay special attention to the definition and implementation of product/service quality. [18] proposed six steps for a successful quality system in the hospitality industry: 1. Taking into account the type of guests being served; 2. Determining what guests want; 3. Developing a procedure for providing what guests want; 4. Staff training and motivation; 5. Implementation of the revised system; 6. Evaluation and corrections of the service delivery system.

For example, the globally distributed hotel group Hilton has implemented a superior service program, which trains employees to anticipate guest needs, personalize service, and if necessary, resolve complaints quickly and seamlessly, in an effort to ensure a high level of guest satisfaction [16]. This is supported by [47] who also emphasizes that service providers in the first lines of service play a significant role in creating guest satisfaction, harmonizing hotel service and the service process with the needs of today's guests, while building strong personalized relationships and long-term relationships. The same author emphasizes the importance of tourist staff as "carriers of quality" of products/services, differentiating themselves in the modern tourist market, delivering quality service while creating guest loyalty and satisfaction. Additionally, the Hilton Group uses rigorous inspections and surveys to monitor guest loyalty [4].

In addition to Hilton, the world-famous Ritz Carlton hotel group is an example of a company that is extremely focused on human resources (staff) [54]. Quality lies in satisfied staff. In accordance with what previous studies have already shown, satisfied hotel employees feel enthusiastic and inspired by their work and tend to provide guests with a better quality of service [47]. There are various forms of hotel product/service quality, and among the most important are issued [14]:

- Mandatory quality – is based on compliance with certificates, standards and licenses prescribed by the state or other relevant institutions, so that hotel products-services are harmonized and respected by the hotel;
- Objective quality – refers to quality supervision according to established standards;
- Required quality – refers to the conformity of the awareness of the required and expected quality of the guests;
- Expected quality – is based on the perception of guests before visiting the hospitality facility;
- Relative quality – focuses on the satisfaction of service users;
- Integrated quality – represents the level of products and services, which are in accordance with modern market requirements;
- Experienced quality – is reflected in the end result of the guests' experience of hotel products/services, which are realized during the service/production process of the hotel facility;
- Global quality – refers to the harmonization of hotel products and services with global market requirements.

In their research, [48] emphasize that quality, as an indispensable part of hotel services, is the key to success, first of all, in retaining regular and attracting new guests. [41] claim that in their operations, hotel facilities should also take into account various aspects of quality that contribute to the creation of the image of the hotel facility:

- *Technical aspect of quality* – refers to the originality of the appearance of the hotel, starting with the lobby itself, reception, service rooms, rooms (comfort, comfort, lighting), technical devices (internet speed, mini-bar equipment, etc.), conference rooms, accompanying tourist facilities (sports hall, gym, swimming pool, etc.) [19].
- *The functional aspect of quality* – represents the hotel product/service and their ability to satisfy guests' needs [2].
- *Spatial aspect of quality* – talks about the connection and functionality of the space inside the hotel with external contents and their connection with the local infrastructure [24].
- *The ecological aspect of quality* – is reflected in the preservation of the environment, which means operating in accordance with ecological standards, which include proper waste storage, recycling of waste material, control of water consumption, etc. [32].
- *The social aspect of quality* – implies the ethical responsibility of the hotel towards guests due to unforeseen disasters (political troubles, etc.) [35].
- *The aesthetic aspect of quality* – concerns the evaluation of the quality of service in hotels and in relation to the hotel exterior and interior, the exterior of the hotel, which significantly contribute to the perception of quality [57].
- *The economic dimension of quality* – it is expressed by reducing costs, profits of the hotel, while not impairing the established quality of hotel products [27].

Based on the previously mentioned aspects of quality, Figure 1 shows a pictorial representation of quality aspects.

Figure 1: Aspects of quality in the hotel industry

Source: Adapted from [41]

On the other side, in order to ensure a consistent level of food quality, then maintain guest satisfaction and control food costs, it is important to use portion size standards, i.e. the amount of each menu item served for a given price that can be described by number/weight while using standard recipes [20]. In other words, management should clearly define quality standards [1]. Guests enjoy visiting establishments where the food quality is good, as this supports the notion of "value for money".

However, no matter how fast the food is delivered, if the quality of the food is not good enough, it will not attract guests. Food and beverage quality is one of the most important determinants of guest satisfaction in the hotel industry. [30] point out that the relative factors that make up food quality are: presentation, health options, taste, freshness, variety and temperature, and that food presentation affects guests' appetite and their perception of food and beverage quality.

Similarly, [17] highlighted the importance of food and beverage quality as a measure of guest satisfaction in the restaurant industry, adopting five dimensions or attributes of food quality that include: food freshness, food taste, food nutritional value, menu variety, and food aroma. Providing quality food is an important way to increase guest loyalty and retention and maximize restaurant revenue [30] since repeat guests spend more on food than new guests on hotel services, hotel products, food and beverages. According to [37], the main contribution of a good quality management system is the provision of consistent quality products, as well as high demand for guest expectations.

Generally, food quality can be described through six components: (1) presentation, (2) variety, (3) healthy options, (4) taste, (5) freshness, and (6) temperature [30]. Control and access to food quality contribute to the same goal, which is guest satisfaction. In order to create a high-quality gastronomic product, it is important to buy good ingredients, store them properly, prepare food according to appropriate standard recipes and control costs.

[43] explained that to achieve a consistent level of food quality, clear standards for the implementation of all activities and processes in food production are necessary, which should be established and easily accessible to all staff. According to [12] well-prepared quality food in a hotel and restaurant, regardless of size, brings profit and increases the total income of the hospitality facility. The same author claims that one of the misconceptions about serving quality food in hotels is hiring a good chef and leaving all operations to him, and he emphasizes the importance of a team approach in hotel service operations, in order to ensure consistent food quality. [13] consider that food preparation has a very short operating cycle that provides little time for error correction – therefore it is crucial to achieve quality food on the first try.

[29] are of a similar opinion, who point out that in order to save time and costs, it is important to produce a quality product the first time, without going back for correction and repair. It has been estimated that the costs of poor quality amount to about 20% of gross profit in the manufacturing industry, while in the service industry they are on average about 30%. The cost of attracting new guests is three to five times higher than the cost of retaining an existing guest, and the gastronomic quality must be impeccable. [36] investigated the reasons for hotel/restaurant failure and identified the following items: lack of a documented strategy; lack of a written mission and vision; inability or unwillingness to create written, documented and maintained operating standards; frequent changes in management and staff; lack of integration of mission

and vision in work; lack of management commitment and employee involvement; and poor quality products.

On the example of luxury hotels in New York and California, it was found that food quality and service quality have a significant impact on the effect of guest loyalty. In a recent study in the Republic of Serbia by [8], the authors point out that the quality of the food and beverage offering depends largely on employee satisfaction.

Another study with empirical research indicates that the quality and safety of food in the hospitality sector depends primarily on the will of management [50]. Duty of food producers (hotels, motels, restaurants, etc.) is to provide high-quality, safe, hygienically prepared meals and drinks, with all the nutritional-sensory properties of food, meeting guests' expectations and thus ensuring the health of guests who consume the prepared food.

Previous studies [15] have identified food quality, service quality and ambience as the main factors that determine restaurant service quality. [23] pointed out the importance of consistent product quality, by documenting work flow and issuing certificates as evidence of compliance with standards. A gastronomic product must be delivered with consistent quality and at an appropriate price in order to meet guests' expectations.

A study with empirical findings shows that by carefully evaluating, preventing and reducing errors in the food and beverage sector, a hotel can significantly improve its financial performance [40]. All entities involved in food production are obliged to establish a food safety system in accordance with the principles of good hygiene practice, good production practice, and HACCP, and thus ensure food safety, i.e. enjoying quality food and drinks [5].

Methods and research results

Due to the epidemiological situation caused by the Covid-19 virus, data in hotels in Serbia was collected with the help of an online questionnaire with open and closed questions, semi-structured and Likert scale questions, with a focus on the food and beverage sector during a stay in 4* and 5* hotels (restaurant, room service, lounge bar). The research was conducted in the period from March 2021 to April 2022.

The survey questionnaire was sent to the hotels by the HORES association of hoteliers and restaurateurs. Out of 546 filled forms, the questionnaire was correctly filled out by 440 respondents who were informed that the survey was completely anonymous and that the collected information would be used exclusively for research purposes (see Table 1). Coupled with meticulous analysis, this study employed the statistical software SPSS 22 to provide robust empirical insights.

Quantitative and qualitative methods were used in the doctoral dissertation to obtain answers to research questions and achieve goals and objectives. In addition, SPSS 22 software was used, with the help of which the author obtained the data presented in the rest of the paper.

The historical-logical method was used for the collection and study of existing literature and overall material related to the issues of research in the dissertation, with a special focus on the quality of the gastronomic offer and its impact on achieving overall consumer satisfaction.

Descriptive analysis presents the conclusions reached on the basis of the collected theoretical-empirical material (see Table 2).

Descriptive statistics were used to analyze and describe food and beverage quality parameters: ambience, innovation, guest satisfaction, services, food and beverage satisfaction, service quality, staff standards, and expertise (analysis and description of quality parameters).

Analytical observation and study of factors that have a special importance for determining the quality of the gastronomic offer, as well as an overview of their possible influence and implications for achieving the highest quality gastronomic service and consumer satisfaction.

Surveying and observation methods, as part of online research, were used to obtain guests' opinions and attitudes about the quality of gastronomy in 4* and 5* hotels in Serbia.

Correlation analysis was conducted to examine the relationship between: ambience, innovation, guest satisfaction, prior experience, guest satisfaction with food and beverage, service quality, standards, staff knowledge and expertise, meal arrangement, food and beverage price, meal portion size, and gastronomic experience.

Linear regression was conducted to examine the influence of food and beverages on the overall gastronomic experience, the influence of previous experience on satisfaction with food and beverages, and to investigate the importance of the level of knowledge, training and specialization of hotel service personnel on the quality of service. Also, multiple regression was used to examine the impact of service quality on guest satisfaction. Linear regression was used to measure the influence of the expertise of the service staff on the gastronomic experience, the effect of the gastronomic experience on the satisfaction of guests, as well as the influence of the price on the perception of the quality of food and drinks.

Multiple regression was conducted to check the influence of portion size and food presentation on guest satisfaction, and to examine the importance of ambience, taste, food and beverage presentation, service provided, prices of gastronomic products, and innovation on the quality of food and beverages.

H1: The quality of the hotel's hospitality facilities (restaurant, cafe bar, lounge bar, etc.) depends on the level of knowledge, training, and specialization of the hotel's service staff and affects guest satisfaction is confirmed. The knowledge, training and specialization of the service staff have a statistically significant effect on the quality of the service. The quality of service has a statistically significant effect on guest satisfaction.

The results in Table 3 indicate that the model is significant ($F(1, 438) = 101.42$; $p = 0.00$). One predictor variable explains 18.8% ($R2 = 0.188$) of the variation of the dependent variable – service quality. Knowledge and training, specialization of service staff contribute significantly to the explanation of service quality ($\beta = 0.43$, $p = 0.00$). The increase in knowledge and training, specialization of service staff by 1 standard deviation (sd = 0.88) is accompanied by an increase in service quality by 0.43 sd.

H2: The gastronomic experience of the prepared meals and drinks depends on the expertise of the service staff (cooks, waiters, management) and affects the overall satisfaction of the guests is confirmed. The expertise of the staff has a statistically significant effect on the gastronomic experience of the guests. Also, the gastronomic experience has a statistically significant effect on the satisfaction of the guests. In order to check the influence of the gastronomic experience on the overall satisfaction of the guests, linear regression was used. The

Table 1: Socio-demographic characteristics of respondents

V1	V2	N	%
Gender	Male	268	60.73
	Female	172	39.27
Years of age	Between 18-26	34	7.74
	Between 27-41	188	42.82
	Between 42-55	141	32.12
	Between 56-64	58	13.21
	65+	18	4.10
Education level	High school degree	63	14.32
	College degree	149	33.86
	Bachelor's degree	129	29.32
	Master's degree	85	19.32
	PhD	14	3.18
Status of employment	Unemployed	28	6.36
	Student	2	0.45
	Retired	20	4.55
	Entrepreneur	76	17.27
	Employed	314	71.36
Earnings (in RSD)	50,000	51	11.59
	50,000-100,000	152	34.55
	100,000-200,000	166	37.73
	200,000+	71	16.14

*V-Variable; N-number; % - percentage
Source: [58], Authors' research

Table 2: Results of descriptive statistical analysis

		N	%
Previous stay in a 4* or 5* hotel	No	25	5.68
	Yes	415	94.32

*N=number of respondents %=expression of respondents in percentage
Source: [58], Authors' research

Table 3: Contribution of the level of knowledge, training, and specialization of the hotel's service staff to the explanation of service quality

	Unstandardized coefficients		Standardized coefficients			95% confidence interval for B		Correlation	
	B	S.E	Beta	t	p	Lower limit	Upper limit	Partial	Semipartial
A constant	1.677	.119		14.117	.000	1.444	1.911		
Knowledge Training Service Staff	.284	.028	.434	10.070	.000	.229	.339	.434	.434

Source: [58], Authors' research

predictor variable is the gastronomic experience, and the criterion variable is the satisfaction of the guests. A preliminary analysis was conducted to check whether the assumptions of normality, linearity and homoscedasticity were violated. There are no extreme values in the data because Mahalanobis distances are below the critical value for one independent variable of 10.83. The assumption of normality of the residuals was violated ($W(440) = 0.96$, $p = 0.00$). The results in Table 4 indicate that the model is significant ($F(1, 438) = 69.09$; $p = 0.00$). One predictor variable explains 13.6% ($R2 = 0.010$) of the variation of the dependent variable – guest satisfaction.

Gastronomic experience contributes statistically significantly to the model ($\beta = 0.37$, $p = 0.00$). An increase in gastronomic experience by 1 standard deviation (sd=1.00) is accompanied by an increase in guest satisfaction by 0.37 sd.

Conclusion

Quality is becoming increasingly important for hotel businesses in an increasingly competitive industry. Various reasons have contributed to this, including the increase in the rights of consumers who are aware of the quality of products and services. In accordance with the aforementioned, competition in modern tourist markets makes hotel companies more aware of the need for quality of products and services.

Quality in tourism and hospitality industry is a popular topic in a large number of research papers. There is widespread agreement that quality consists of physical and intangible factors, and that its intangibility often leads to uneven service delivery. Moreover, opinions about quality are developed during the production, distribution and consumption processes. Good and negative guest experiences, as well as their positive and negative emotions, can have a significant impact on the perceived quality of services and products. Moreover, quality comes from the field of marketing, which emphasizes the human relationship between companies and their clients.

Also, quality includes the idea of meeting and exceeding guests' expectations, and improved service/product quality is considered to have a beneficial effect on hotel business performance. On the other hand, tourism is becoming an increasingly globalized industry, with increased rivalry between destinations. This issue is driven, among other things, by the fact that tourism businesses, including hotels, are now in a stronger position to compete in international locations, resulting in increased international rivalry, not only between destinations but also between hotel facilities. Tourists, on the other hand, are becoming increasingly demanding and are not only interested in prices. In this context, the competitiveness of the hotel business must be focused on improving performance through improved product/service quality and striving for differentiation. This new reality has encouraged many hotel companies to create quality management systems. On the one hand, there is a desire to establish a quality culture, focused on reducing costs and defects, as well as improving products and efficiency. Also, there is a desire to improve the business image, gain a competitive advantage, adapt to the needs of guests and, finally, explore the possibility of entering new markets. For these reasons, hotel companies began to worry about the quality of products and services, fearing that it could affect business performance.

The strategic idea of hotel management about the quality of physical and intangible parts of hotel goods is a means of gaining a competitive advantage in the tourism industry. Hospitality is a multi-billion dollar sector that includes several activities, of which the accommodation sector, the food and beverage sector, and the organization of events stand out in the hotel business. No hospitality company will do well if it is not directed towards its guests, especially if it is not acted in accordance with their wishes, demands, and expectations.

Table 4: Contribution of the gastronomic experience to the explanation of guest satisfaction

	Unstandardized coefficients		Standardized coefficients			95% confidence interval for B		Correlation	
	B	S.E	Beta	t	p	Lower limit	Upper limit	Partial	Semipartial
A constant	2.970	.137		21.646	.000	2.700	3.240		
Gastronomic experience	.284	.034	.369	8.312	.000	.217	.351	.369	.369

Source: [58], Authors' research

Service quality in the hotel industry has been identified as a critical aspect in the search for long-term competitive advantage. For this reason, quality can affect performance in two complementary ways. It can have internal consequences through procedures and external consequences through the market. The implications of internal performance are related to the internal functioning of hotel organizations (e.g. increased productivity, improved efficiency, reduction of costs and waste). Therefore, quality can increase the competitiveness and profitability of hotel facilities by standardizing processes, reducing waste, providing more efficient service, and reducing errors. However, the external performance implications are related to the effects of quality on guest satisfaction and demand (e.g. increasing sales and market share, maintaining tourism links, attracting new visitors, and achieving higher levels of tourist satisfaction while improving image).

Quality service starts with the hospitality company and its quality strategy. A well-developed and implemented quality strategy, together with standards, rules and dedicated staff, will help a hotel business to operate successfully. Managing guest expectations will be easier if the organization has defined and reviewed the main components of quality. To achieve outstanding service quality, it should be ingrained in the company's culture. Hotel goods can be considered as diverse, connected and related services and as such represent an excellent area for the introduction of technology and social innovation, which implies the improvement in the quality of hotel services and products.

An important element in this process is the selection of innovations by hotel management that will most effectively contribute to the improvement of the quality of hotel products/services. Interaction in the design and delivery of hotel products and services is a dominant component of service quality, including courtesy, civility, flexibility and a willingness to engage with guests. In accordance with the aforementioned, the quality of hotel products and services has a significant impact on the market position and market share of the hotel company, which significantly contributes to increasing profitability in long-term financial performance and profitability. Of course, it is necessary to pay attention to the gastronomic quality, which represents an important segment of the business of hotel companies. The reason for visiting or staying in a hotel restaurant is often the meals that can be consumed.

Hotel restaurants must design their gastronomic offer as well as focus on their target group of guests. The development and improvement of quality in the gastronomic sector leads to the development and improvement of other hotel activities that are directly or indirectly interconnected. Today, many famous hotels around the world build their image through a history of exceptional food, i.e. in order to improve the overall quality of service, be it national cuisine or international specialties. Certainly, agricultural goods, vegetables, fruits and beverages (e.g. wine, spirits, etc.) must meet certain quality criteria, as well as the modern tourist's demand for nutritious cuisine. It should be kept in mind that the continuous improvement of gastronomic quality is a preventive and not a corrective approach to its improvement. On the other hand, it is necessary to mention the standards which help hotel companies to successfully maintain and establish business in all aspects of hotel business.

A hotel restaurant's management needs to pay closer attention to its patrons and learn about their wants and expectations regarding the quality of the cuisine in order to make the business lucrative and successful. The existence of hotel restaurants depends heavily on the happiness of their patrons. In hotel facilities, maintaining a high standard of culinary offerings has a big influence on guest retention. In gastronomy, it is essential to perform routine internal and external quality audits in order to attain food quality.

Based on the research, we can conclude that dedication, concentration, ongoing improvement, and quality maintenance in the gastronomic offer of goods and services, as well as personnel in the hotel's hospitality facility, can positively impact the hospitality facilities' successful operation and, ultimately, the satisfaction of the visitors.

References

1. Akunne, C. J., & Adeniji, P. O. (2021). Assessment of Food Service Quality of Chicken Republic and Mega Chicken Restaurants, Lagos, Nigeria. *Food and Nutrition Sciences*, *12*(6), 602-613. Retrieved from https://www.scirp.org/pdf/fns_2021062814230075.pdf

2. Alhelalat, J. A., Ma'moun, A. H., & Twaissi, N. M. (2017). The impact of personal and functional aspects of restaurant employee service behaviour on customer satisfaction. *International Journal of Hospitality Management*, *66*, 46-53. Retrieved from https://modir3-3.ir/article-english/isi304-20178845.pdf
3. Alomari, B. M. A., Awawdeh, A. M. H., & Alolayyan, M. N. (2017). Employee performance and quality management in the tourism sector (Case study of human resources management–employee performance). *Modern Applied Science*, *11*(9). Retrieved from https://www.researchgate.net/publication/318911193_Employee_Performance_and_Quality_Management_in_the_Tourism_Sector_Case_Study_of_Human_Resources_Management_-_Employee_Performance
4. Applegate, L. M., Piccoli, G., & Dev, C. S. (2008). *Hilton hotels: Brand differentiation through customer relationship management*. Harvard Business School Pub. Retrieved from https://shorturl.at/bfrx7
5. Aziz, S. A. A., & Dahan, H. M. (2013). Food handlers' attitude towards safe food handling in school canteens. *Procedia-Social and Behavioral Sciences*, *105*, 220-228. Retrieved from https://shorturl.at/mpvAS
6. Banerjee, S. (2018). Impact of employee involvement on providing quality services in tourism sector for developing nation's economic potential-A study on West Bengal. *International Journal of Business and Applied Social Science (IJBASS)*, *4*(7). Retrieved from https://shorturl.at/yDR23
7. Bhat, M. A. (2012). Tourism service quality: A dimension-specific assessment of SERVQUAL. *Global Business Review*, *13*(2), 327-337. Retrieved from https://citeseerx.ist.psu.edu/document?repid=rep1&type=pdf&doi=d78e7ac6514ed4e447fd273506d448eab98c0382
8. Borovčanin, D., & Kilibarda, N. (2020). Assuring good food handling practices in hospitality, financial costs and employees' attitudes: A case study from Serbia. *Scientific journal "Meat Technology"*, *61*(1), 82-94. Retrieved from https://journalmeattechnology.com/index.php/meat_technology/article/view/2020.61.1.8/113
9. Chand, M., & Slath, A. (2018). Impact of food and beverage service practices on customer satisfaction in the food outlets, Chandigarh, India. *International Journal of Hospitality and Tourism Systems*, *11*(2), 73. Retrieved from https://t.ly/LkHAv
10. Chang, S. (2018). Experience economy in the hospitality and tourism context. *Tourism Management Perspectives*, *27*, 83-90. Retrieved from https://sci-hub.3800808.com/10.1016/j.tmp.2018.05.001
11. Chi, C. G. Q., Wen, B., & Ouyang, Z. (2020). Developing relationship quality in economy hotels: the role of perceived justice, service quality, and commercial friendship. *Journal of Hospitality Marketing & Management*, *29*(8), 1027-1051. Retrieved from https://sci-hub.3800808.com/10.1080/19368623.2020.1748158
12. Clarke, P. (2015). *How to Run a Profitable (Hospitality) Hotel, Resort, Restaurant, Food and Beverage Business*. Strategic Book Publishing & Rights Agency. Retrieved from https://shorturl.at/hFKT1
13. Waller, K. (2009). *Improving food and beverage performance*. Taylor & Francis. Retrieved from https://shorturl.at/uvGW2
14. DeFranco, A. L., Morosan, C., & Hua, N. (2017). Moderating the impact of e-commerce expenses on financial performance in US upper upscale hotels: The role of property size. *Tourism Economics*, *23*(2), 429-447. Retrieved from https://sci-hub.3800808.com/10.5367/te.2015.0510
15. Dutta, K., Parsa, H. G., Parsa, R. A., & Bujisic, M. (2014). Change in consumer patronage and willingness to pay at different levels of service attributes in restaurants: A study in India. *Journal of Quality Assurance in Hospitality & Tourism*, *15*(2), 149-174. Retrieved from https://www.tandfonline.com/doi/abs/10.1080/1528008X.2014.889533
16. Enz, C. A., & Siguaw, J. A. (2000). Best practices in service quality. *Cornell Hotel and Restaurant Administration Quarterly*, *41*(5), 20-29. Retrieved from https://sci-hub.3800808.com/10.1080/1528008x.2014.889533
17. Gagić, S., Tešanović, D., & Jovičić, A. (2013). The vital components of restaurant quality that affect guest satisfaction. *Turizam*, *17*(4), 166-176. Retrieved from https://scindeks-clanci.ceon.rs/data/pdf/1450-6661/2013/1450-66611304166G.pdf
18. Hayes, D. K., Ninemeier, J. D., & Miller, A. A. (2017). *Hotel operations management*. Pearson. Retrieved from https://thuvienso.hoasen.edu.vn/handle/123456789/12442
19. Jasinskas, E., Streimikiene, D., Svagzdiene, B., & Simanavicius, A. (2016). Impact of hotel service quality on the loyalty of customers. *Economic research-Ekonomska istraživanja*, *29*(1), 559-572. Retrieved from https://hrcak.srce.hr/file/253402
20. Kafetzopoulos, D. P., & Gotzamani, K. D. (2014). Critical factors, food quality management and organizational performance. *Food control*, *40*, 1-11. Retrieved from https://sci-hub.3800808.com/10.1016/j.foodcont.2013.11.029
21. Kapiki, S., & Tatari, N. (2006). *Quality Management in Tourism Accommodations: The European Flower*. ShMILE Sustainable hotels in Mediterranean Islands and area A demonstration project in Corsica, Sardinia and Halkidiki for EU-wide promotion of the EU eco-label on tourist accommodation service, DOI, 10.13140/RG.2.1.4476.1447
22. Kerdpitak, C., & Heuer, K. (2016). Key success factors of tourist satisfaction in tourism services provider. *Journal of Applied Business Research (JABR)*, *32*(4), 1237-1242. Retrieved from https://clutejournals.com/index.php/JABR/article/view/9733/9827
23. Kondo, Y. (2000) Innovation versus standardization. *The TQM Magazine*, *12*(1), 6-10. Retrieved from https://www.emerald.com/insight/content/doi/10.1108/09544780010287177/full/html
24. Lathifa, J., Kusuma, N. R., & Arvanda, E. (2019). Creating atmosphere in hotel interior space with material roles: Bata Pejaten. In *IOP Conference Series: Materials Science and Engineering* (Vol. 523, No. 1, p. 012053). IOP Publishing. Retrieved from https://sci-hub.3800808.com/10.1108/09544780010287177
25. Law, R., Bai, B., Crick, A. P., & Spencer, A. (2011). Hospitality quality: new directions and new challenges. *International Journal of Contemporary Hospitality Management*. Retrieved from https://sci-hub.3800808.com/10.1108/09596111111129986
26. Liat, C. B., Mansori, S., Chuan, G. C., & Imrie, B. C. (2017). Hotel service recovery and service quality: Influences of corporate image and generational differences in the relationship between customer satisfaction and loyalty. *Journal of Global Marketing*, *30*(1), 42-51. Retrieved from https://sci-hub.3800808.com/10.1080/08911762.2016.1262932
27. Mohammed, A., & Rashid, B. (2018). A conceptual model of corporate social responsibility dimensions, brand image, and customer satisfaction in Malaysian hotel industry. *Kasetsart*

Journal of social sciences, *39*(2), 358-364. Retrieved from https://sci-hub.3800808.com/10.1016/j.kjss.2018.04.001

28. Mok, C., Sparks, B., & Kadampully, J. (2013). *Service quality management in hospitality, tourism, and leisure*. Routledge. Retrieved from https://shorturl.at/gFNU2
29. Munoz, A. M., Civille, G. V., & Carr, B. T. (1992). *Sensory Evaluation in Quality Control Van Nostrand Reinhold. New York*. Retrieved from https://shorturl.at/eixV6
30. Namkung, Y., & Jang, S. (2007). Does food quality really matter in restaurants? Its impact on customer satisfaction and behavioral intentions. *Journal of Hospitality & Tourism Research*, *31*(3), 387-409. Retrieved from https://sci-hub.3800808.com/10.1177/1096348007299924
31. Nikolskaya, E. Y., Kovaleva, N. I., Uspenskaya, M. E., Makshakova, N. I., Lysoivanenko, E. N., & Lebedev, K. A. (2018). *Innovative quality improvements in hotel services*. Retrieved from https://www.um.edu.mt/library/oar/bitstream/123456789/33728/1/Innovative_Quality_Improvements_in_Hotel_Services_2018.pdf
32. Orfin-Tomaszewska, K., & Sidorkiewicz, M. (2019). Shaping the image of a hotel facility in the context of sustainable development. In *Conference Proceedings Determinants Of Regional Development* (No. 1). Retrieved from http://pes.pwsz.pila.pl/index.php/proceedings/article/view/167/133
33. Ottenbacher, M., & Gnoth, J. (2005). How to develop successful hospitality innovation. *Cornell hotel and restaurant administration quarterly*, *46*(2), 205-222. Retrieved from https://sci-hub.3800808.com/10.1177/0010880404271097
34. Oviedo-García, M. Á., Vega-Vázquez, M., Castellanos-Verdugo, M., & Orgaz-Agüera, F. (2019). Tourism in protected areas and the impact of servicescape on tourist satisfaction, key in sustainability. *Journal of Destination Marketing & Management*, *12*, 74-83. Retrieved from https://sci-hub.3800808.com/10.1016/j.jdmm.2019.02.005
35. Palacios-Florencio, B., García del Junco, J., Castellanos-Verdugo, M., & Rosa-Díaz, I. M. (2018). Trust as mediator of corporate social responsibility, image and loyalty in the hotel sector. *Journal of Sustainable Tourism*, *26*(7), 1273-1289. Retrieved from https://mariocastellanos.es/wp-content/uploads/2018/04/Trust-as-mediator-of-corporate-social-responsibility-image-and-loyalty-in-the-hotel-sector.pdf
36. Parsa, H. G., Self, J. T., Njite, D., & King, T. (2005). Why restaurants fail. *Cornell Hotel and Restaurant Administration Quarterly*, 46(3), 304-322. Retrieved from https://journals.sagepub.com/doi/abs/10.1177/0010880405275598
37. Presbury, R., Fitzgerald, A., & Chapman, R. (2005). Impediments to improvements in service quality in luxury hotels. *Managing Service Quality: An International Journal*, *15*(4), 357-373. Retrieved from https://sci-hub.3800808.com/10.1108/09604520510606835
38. Radosavljević, G. (2006). *Kvalitet kao strategija razvoja turizma Srbije. Quality as strategy of tourism development in Serbia.* 33 Nacionalna konferencija o kvalitetu. Kragujevac. Retrieved from https://www.cqm.rs/fq2006/pdf/A/49%20-%20Radosavljevic%20G.pdf
39. Rahman, M. S., Osman-Gani, A. M., & Raman, M. (2017). Destination selection for education tourism: Service quality, destination image and perceived spirituality embedded model. *Journal of Islamic Marketing*. Retrieved from https://sci-hub.3800808.com/10.1108/JIMA-10-2015-0080
40. Ramdeen, C., Santos, J., & Chatfield, H. K. (2007). Measuring the cost of quality in a hotel restaurant operation. *International Journal of Contemporary Hospitality Management*. Retrieved from https://sci-hub.3800808.com/10.1108/09596110710747625
41. Ramphal, R. R., & Nicolaides, A. (2014). *Service and quality and quality service: satisfying customers in the hospitality industry*. Retrieved from https://www.ajhtl.com/uploads/7/1/6/3/7163688/article_45_vol_3_2_july_2014.pdf
42. Renko, S., Renko, N., & Polonijo, T. (2010). Understanding the role of food in rural tourism development in a recovering economy. *Journal of Food Products Marketing*, *16*(3), 309-324. Retrieved from https://sci-hub.3800808.com/10.1080/10454446.2010.485096
43. Ryu, K., Lee H.R., & Kim, W.G. (2012). The influence of the quality of the physical environment, food, and service on restaurant image, customer perceived value, customer satisfaction, and behavioral intentions. *International Journal of Contemporary Hospitality Management*, *24*(2), 200-223. Retrieved from https://sci-hub.3800808.com/10.1108/09596111211206141
44. Shahid Iqbal, M., Ul Hassan, M., & Habibah, U. (2018). Impact of self-service technology (SST) service quality on customer loyalty and behavioral intention: The mediating role of customer satisfaction. *Cogent Business & Management*, *5*(1), 1. Retrieved from https://sci-hub.3800808.com/10.1080/23311975.2018.1423770
45. Sun, K. A., & Kim, D. Y. (2013). Does customer satisfaction increase firm performance? An application of American Customer Satisfaction Index (ACSI). *International Journal of Hospitality Management*, *35*, 68-77. Retrieved from https://sci-hub.3800808.com/10.1016/j.ijhm.2013.05.008
46. Vrtiprah, V. (2001). Managing quality in hotel excelsior. *Journal of Quality Assurance in Hospitality & Tourism*, *2*(3-4), 111-126. Retrieved from https://sci-hub.3800808.com/10.1300/J162v02n03_07
47. Vučković, J. (2015). Uticaj uslužnog ponašanja zaposlenih na kvalitet usluga. *Turističko poslovanje*, *15*, 135-143. Retrieved from http://visokaturisticka.edu.rs/docs/tupos/tupos15/rad13.pdf
48. Vujko, A., Vujnić, J., Gajić, T., & Petrović, M. (2016). Kvalitet usluga u turističkim preduzećima kao model upravljanja turističkom destinacijom. *Škola biznisa*, *1*(2016), 22-31. Retrieved from https://aseestant.ceon.rs/index.php/skolbiz/article/view/11596
49. Wu, L., Wei, G., Gao, H., & Wei, Y. (2018). Some interval-valued intuitionistic fuzzy Dombi Hamy mean operators and their application for evaluating the elderly tourism service quality in tourism destination. *Mathematics*, *6*(12), 294. Retrieved from https://www.mdpi.com/2227-7390/6/12/294
50. Wu, S. L. (2012). Factors influencing the implementation of food safety control systems in Taiwanese international tourist hotels. *Food Control*, *28*(2), 265-272. Retrieved from https://sci-hub.3800808.com/10.1016/j.foodcont.2012.05.038
51. Yang, C. C. (2017). The evolution of quality concepts and the related quality management. In *Quality Control and Assurance-An Ancient Greek Term Re-Mastered*. IntechOpen. Retrieved from https://shorturl.at/esLP3
52. Yang, C. C., Chen, P. S., & Chien, Y. H. (2014). Customer expertise, affective commitment, customer participation, and loyalty in B & B services. *International Journal of Organizational Innovation* (Online), *6*(4), 174. Retrieved from https://www.

proquest.com/openview/83bac1e9ff572bdc12860103f35cf0cc/1?pq-origsite=gscholar&cbl=55118

53. Ye, Q., Li, H., Wang, Z., & Law, R. (2014). The influence of hotel price on perceived service quality and value in e-tourism: An empirical investigation based on online traveler reviews. *Journal of Hospitality & Tourism Research*, *38*(1), 23-39. Retrieved from https://sci-hub.3800808.com/10.1177/1096348012442540
54. Yeung, A. (2006). Setting people up for success: How the Portman Ritz-Carlton hotel gets the best from its people. Human Resource Management: Published in Cooperation with the School of Business Administration, *The University of Michigan and in alliance with the Society of Human Resources Management*, *45*(2), 267-275. Retrieved from https://deepblue.lib.umich.edu/bitstream/handle/2027.42/49304/20108_ftp.pdf?sequence=1
55. Yoshida, M., & James, J. D. (2011). Service quality at sporting events: Is aesthetic quality a missing dimension? *Sport Management Review*, *14*(1), 13-24. Retrieved from https://sci-hub.3800808.com/10.1016/j.smr.2009.06.002
56. Zaibaf, M., Taherikia, F., & Fakharian, M. (2013). Effect of perceived service quality on customer satisfaction in hospitality industry: Gronroos' service quality model development. *Journal of Hospitality Marketing & Management*, *22*(5), 490-504. Retrieved from https://sci-hub.3800808.com/10.1080/19368623.2012.670893
57. Zemke, D. M. V., Raab, C., & Wu, K. (2018). How does hotel design contribute to property performance? *International Journal of Contemporary Hospitality Management*. Retrieved from https://sci-hub.3800808.com/10.1108/IJCHM-06-2016-0330
58. Zrnić, M. (2023). Uloga i značaj kvaliteta u upravljanju zadovoljstvom korisnika gastronomskih usluga u hotelima sa 4* i 5* u Srbiji. Univerzitet Singidunum. Retrieved from https://nardus.mpn.gov.rs/bitstream/handle/123456789/21396/bitstream_150813.pdf?sequence=2

Miloš Zrnić

is a senior lecturer at the Academy of Vocational Studies – The College of Hotel Management. He graduated from the College of Hotel Management, majoring in gastronomy, where he also completed specialist studies. Miloš Zrnić enrolled and completed his master's studies at the Faculty of Tourism and Hotel Management at Singidunum University, majoring in tourism and hotel management. After obtaining the title of Master of Economics in the field of tourism, Miloš enrolled in doctoral studies in 2020 at the Faculty of Tourism and Hotel Management, Singidunum University, majoring in Business Systems in Tourism and Hospitality. Zrnić built his professional career in eminent hotels such as the Ritz London, Claridge's, Hilton London, Marriott London, Corinthia London, Rosewood London, etc. Since 2017, Miloš has been engaged as a senior lecturer at the Higher Hotel Management School, which in 2021 became part of the Belgrade Academy of Vocational Studies. As a guest lecturer, he has been engaged at prestigious faculties in Great Britain, Dubai and Turkey, and is actively involved in ERASMUS programs as a representative of the College of Hotel Management. He is the author of the book "Gastronomic products", the monograph entitled "The role and importance of the quality of the gastronomic offer in the successful business of the hotels of the Republic of Serbia", as well as the co-author of a large number of domestic and international scientific and research papers. He is also a reviewer for domestic and foreign journals and a regular participant in domestic and foreign conferences in the fields of tourism, hotel industry, management and gastronomy, as well as a participant and organizer of scientific, development-research and professional projects.

Ivana Lončar

was born on December 16, 1982. She earned her bachelor's and master's degrees from the Faculty of Economics at the University of Belgrade. She completed her Ph.D. in 2015 at the Faculty of European Business and Marketing, European University in Belgrade. Following her work in a government institution (Ministry of Economy and Regional Development, 2012-2013), where she handled international cooperation in the tourism sector, she transitioned to the role of Coordinator of Educational Programs for Managers at Mokra Gora School of Management (2014-2015). From 2015 to 2017, she worked as a member of the "Peterhof Consulting" team, where she became the Director of the Marketing Department, responsible for creating promotional campaigns. Since 2017, Ivana Lončar has been employed at the College of Hotel Management in Belgrade as a Professor of Applied Studies in the field of Management and Business – Hospitality. She teaches the following courses in applied studies: Basics of Hospitality, Accommodation Management, Restaurant Management, Operational Management in Hospitality, and Financial Management. Ivana's areas of professional and academic expertise include strategic management, hospitality and restaurant management, financial management, accommodation management, and the organization of hotel enterprises. She has published papers in these fields in scientific journals and conference proceedings at both national and international levels.

REVIEW PAPER
UDK: 061.41(100)"2020"(536.2)
659.113.7(497.11)
DOI: 10.5937/EKOPRE2404245K
Date of Receipt: January 23, 2024

Igor Kovačević
University of Belgrade
Faculty of Economics and Business
Department for Business Economics and Management

Branislava Hristov Stančić
University of Belgrade
Faculty of Economics and Business
Department for Economic Policy and Development

Bojan Zečević
University of Belgrade
Faculty of Economics and Business
Department for Economic Policy and Development

WORLD EXHIBITION (EXPO) AS A NATION BRANDING AND SOFT POWER PLATFORM: THE CASE OF SERBIA'S PARTICIPATION AT EXPO 2020 DUBAI

Svetska izložba (EXPO) kao platforma nacionalnog brendiranja i meke moći – primer nastupa Srbije na EXPO 2020 Dubai

Abstract

With a history of over 130 years, World Exhibitions (EXPOs) have positioned themselves as a channel and tool for implementing the concept of soft power and nation branding. The EXPO 2020 Dubai is the first mega event organized live in the post-COVID period for regular visitors, and the figure of over 24 million visits justified the expectations of Dubai and the UAE in terms of communicating key messages of soft power and positioning the destination. On the other hand, the host's significant investments in the amount of over 7.7 billion dollars during the preparatory and event period will be justified through long-term legacy economic effects amounting to over 42 billion dollars and over 1 million jobs. In addition to the large number of participants, Serbia also had its own pavilion. The focus of its participation, through the aspects of soft power and nation branding, has been on the further establishment of high political-economic relations with the host country, along with the activities aimed at building the destination's image as a regional center of the Western Balkans in the fields of science, business, and development activities. The paper presents key concepts of soft power and nation branding, key specifics of EXPO organization, examples in the field of national brand communication for selected participating countries, as well as key indicators regarding the organization of EXPO 2020 Dubai and Serbia's success as a participating country.

Keywords: *EXPO, world exhibitions, EXPO 2020 Dubai, soft power, nation brand*

Sažetak

Sa istorijom održavanja od preko 130 godina, svetske izložbe (EXPO) su se pozicionirale kao kanal i alat za implementaciju koncepta meke moći i nacionalnog brendiranja. EXPO 2020 Dubai je prvi mega događaj koji je organizovan u post-COVID periodu za redovne posetioce i cifra od preko 24 miliona poseta opravdala je očekivanja Dubaija i UAE u pogledu plasiranja ključnih poruka meke moći i pozicioniranja destinacije. Sa druge strane, značajne investicije domaćina u iznosu od preko 7,7 milijardi dolara tokom pripremnog i perioda održavanja događaja će se opravdati kroz dugoročne ekonomske efekte koji iznose preko 42 milijarde dolara i preko 1 milion radnih mesta. Pored velikog broja učesnika, i Srbija je imala svoj paviljon. Fokus nastupa, kroz aspekt meke moći i nacionalnog brendiranja, bio je baziran na daljem etabiliranju visokih političko-ekonomskih odnosa sa zemljom domaćina, uz aktivnosti izgradnje slike destinacije kao regionalnog centra Zapadnog Balkana u domenu nauke, biznisa i razvojnih aktivnosti. U radu su predstavljeni ključni koncepti meke moći i nacionalnog brendiranja, ključne specifičnosti organizacije EXPO, primeri u domenu komuniciranja nacionalnog brenda za selektirane zemlje učesnice, kao i ključni indikatori organizovanja EXPO 2020 Dubai te indikatori uspešnosti nastupa Srbije kao zemlje učesnice.

Ključne reči: *EXPO, svetska izložba, EXPO 2020 Dubai, meka moć, nacionalni brend*

Understanding the World Exhibition history, role and model

The World Exhibition (hereafter referred to as EXPO) was established as a traditional event in 1851, and has been held regularly ever since, with the EXPO 2020 Dubai taking place 2021-2022 [36, p. 130]. In addition, two new destinations have been confirmed as hosts of future events – 2025 Osaka, Japan and 2027 Belgrade, Serbia, while the host for EXPO 2030 will be decided in November 2023 [7]. The BIE acknowledges several types of EXPO exhibitions [5]: World EXPO, Specialized EXPO, Horticultural EXPO, and Triennale de Milano EXPO. Each type of EXPO needs to follow certain criteria when it comes to the size of the EXPO grounds and duration of the event. According to the BIE "Registered EXPO or World EXPO" is organized every 5 years, lasting a maximum of 6 months, in which participants design and build their own pavilions or rent space from the organizers, and there is no limit on the EXPO site size, while "Recognized EXPO or International EXPO" is organized between two World EXPOs, with a maximum duration of 3 months, where participants can only rent space from the organizers, and the maximum size of the EXPO plot is 25 ha.

According to the Paris Convention [6] "exhibition is a display which, whatever its title, has as its principal purpose the education of the public: it may exhibit the means at man's disposal for meeting the needs of civilization, or demonstrate the progress achieved in one or more branches of human endeavor, or show prospects for the future." EXPO is a platform for destination urban development through the event-led regeneration process that is at the same time organized to support local economic development by attracting foreign direct investments, tourism development, and media outreach [8, p. 1]. Increasingly, over time and throughout history, in order to secure higher visitation, organizers of EXPO have needed to integrate entertainment elements for consumer consumption [10, p. 14].

Understanding nation branding and soft power

Soft power and nation brand are key elements of public diplomacy [20, p. 253]. The term "soft power" was introduced over 30 years ago by [31] to describe a divergence from "hard power" that has its foundation in military activities. It has been confirmed that soft power has higher and more long-term impacts than hard power [39, p. 5]. Table 1 highlights the key differences between hard and soft power.

Soft power is a central tool of nations' foreign policies and is "implemented mainly through the projections of the attractiveness of their national culture" [2, p. 373]. Soft power reflects the capability of a country (nation) to impact the other countries' perception of itself on a global macro scale and to shape the activities of other countries in its favor, while nation branding is seen as a marketing communication activity that targets people in other markets and countries [18, p. 148]. Nation (country) branding is not a simple series of global PR and marketing campaigns, but rather a complex journey of storytelling on subtle and sensitive aspects [32, p. 126]. "Nation branding can be described as a practice used by governments in conjunction with public relations consultants and corporate businesses to launch campaigns promoting a certain image of a nation-state" [4, p. 531]. Nation branding involves a diverse presentation that will reach the target audience/public with the cultural diversity and richness of a country [24, p. 15].

On the other hand, some others equate nation branding with the terms "country of origin" or "place marketing"

Table 1: Difference between hard and soft power

	Hard power	Soft power
Spectrum of behaviors	Command Stress	Setting the agenda Attract and absorb
Resources	Induced force transaction Sanction bribery	Political values Institutional system Cultures Foreign policies (diplomacy)

Source: [28]

[25, p. 253]. The concept of nation branding is also often matched with the "competitive identity" concept, which involves the use of both public diplomacy and brand management in the process of increasing national visibility and competitiveness [3]. Soft power is characterized by its relative, immaterial, and context-based nature, making it difficult to measure and manage [18, p. 152]. The soft power tools vary depending on the political goals and internal dynamics of each country and can be focused on attracting direct foreign investment and foreign tourists [20, p. 256]. "No country has a monopoly on soft power. Any organisation, country and culture can develop soft power – the question is not who can or cannot develop soft power, but to *whom* it is soft power" [18, p. 154].

World Exhibitions as the platforms for national branding and soft power

The organization of the EXPO in a host destination involves the implementation of several strategies, that at the core have the urbanization and sustainability of the event and the EXPO site, as well as the entire city [40, p. 1], although most EXPO sites are either closed, demolished, or enter a "status quo" phase after the exhibition ends [10, p. 4]. The initial aim of organizing an EXPO – to promote the host country's industrial progress and national products [36, p. 138], has evolved over time to providing a global platform that allows public diplomacy activities, the promotion of national culture and intellectual creativity, and the creation of global networks [29, p. 183]. "EXPO 2020 Dubai saw a fascinating fusion of diaspora diplomacy and expo diplomacy as countries with substantial worker populations in the Emirates looked to inspire pride in their own citizens and introduce themselves to their employers and colleagues in the UAE workforce" [9, p. 50]. It is also necessary to recognize that each participating country has the freedom to define its own vision and mission for EXPO participation and to choose its own partners and supporters. Having in mind that EXPO participation entails high costs and budgets that countries need to secure, the role of supporters, partners, and sponsors is very important. Even in this case, countries will insist on promoting the "best" companies from their nation. The question of ethical principles in choosing partners sometimes goes beyond global development goals, like in the example of an "unethical" partnership between Philip Morris International and the Swiss Pavilion at EXPO 2020 Dubai, where Philip Morris was confirmed as one of the two main sponsors of the Swiss pavilion [26, p. 1126].

EXPO is a great opportunity for host and participating countries to use it as an instrument for implementing the soft power toolkit for national branding [36, p. 135], and it is considered a major global event for the host destination since it has a pivotal role in promoting social and economic development [23, p. 1]. In addition, most EXPO hosts will use EXPO as a catalyst for urban regeneration [8, p. 1], the tool that is used to revitalize weakening economies and destinations due to the depraved economic situation, low living and social standards, and an absence of industrial revolutions towards value-added industries [19, p. 20]. Therefore, both the organization of EXPO and a country's participation through a national pavilion can enhance national competitiveness in the global market in various fields and improve national branding [30, p. 11]. In addition, hosting EXPO has a positive influence on industrial activities and production of the host destination, region, and country [27, p. 1478]. However, we need to understand that one destination cannot built its image, brand and reputation through a single event, even if it is an EXPO organized on a large scale, but it requires years of engagement both before and after the event to establish the desired reputation legacy [9, p. 49].

EXPO 2020 Dubai

Although postponed for 1 year due to the global COVID-19 pandemic, the EXPO 2020 Dubai confirmed its role in providing a global platform for national and destination branding, image creation and the demonstration of creativity and innovation by both the host and participating countries [36, p. 129]. "The challenges of organizing such a mega event are many, however, Dubai has proved to be a destination capable of handling a big event with its state-of-the-art infrastructure both in the accommodation and transport sectors" [38, p. 3]. The grand theme of EXPO 2020 Dubai was "connecting minds, creating the future"

and it played a pivotal brand role in proving organizers' desire to position Dubai as a global crossroad and hub for people, ideas, creativity, and cooperation [9, p. 49].

In addition, one of the key pillars in developing Dubai as an EXPO destination was the implementation of the "smart city" concept, which included a focus on digitalization in urban development [35, p. 51]. Dubai was also the first destination in the world that has reintroduced the "live" (in-person) event in the post-COVID-19 era, and despite many restrictions being in place (e.g., vaccination certifications), the EXPO 2020 Dubai managed to attract over 24 million visitors [9, p. 49]. Moreover, one of the major objectives of EXPO Dubai was to reach 4 major sustainability objectives [1, p. 1], [14, p. 17]: leaving a legacy of sustainable infrastructure and future-oriented sustainable practices, catalyzing sustainability efforts in Dubai and the UAE, increasing public awareness by engaging society on sustainability principles and sustainable living, and developing sustainability solutions that are scalable, extending their benefits to the wider economy.

Table 2: Capital expenditure, operating expenditure, and operating revenue of the EXPO 2020 Dubai

Item	Amount in USD, millions
Capital expenditure	
Temporary event-related structures	319
Thematic districts	1,264
Parks	195
Infrastructure	596
Thematic pavilions	669
Dubai Exhibition Centre	449
Project management, design, and supervision	485
Total capital expenditure	**3,977**
Operating expenditure	
Exhibitions and pavilion operations	60
Personnel operations	760
Village and accommodation services	64
Innovation and future technology	615
Support functions	103
Marketing and communications	546
Commercial	98
Events and entertainment	508
Site operations	720
Other	293
Total operating expenditure	**3,776**
Operating revenue	
Sponsorships	880
Rent	93
Ticketing	105
Food and beverage	28
Other	10
Total operating revenue	**1,116**

Source: [12, p. 26]

The EXPO 2020 Dubai enabled the destination of Dubai and the entire UAE to globally demonstrate its image and brand based on first-rate infrastructure, built attractions, outstanding hotel properties, and easy global and local accessibility [21]. The EXPO 2020 was considered as a great opportunity to promote the Sustainable Development Goals of the United Nations, among which raising environmental awareness came across as the most important one [1, p. 1]. One of the goals is related to the social sustainability of local citizens in Dubai and research results showed that "there is a positive trade-off between EXPO economic benefits and the inconvenience that EXPO can cause to residents", such as traffic congestions, increased property rental prices, population growth, unethical drug usage and similar" [38, pp. 13-14]. "The EXPO 2020 Dubai showed the continued viability of EXPO as a public diplomacy form" [9, p. 49].

The UAE and Dubai, as hosts, have shown great dedication in organizing a remarkable event. Table 2 highlights investments and ROI from the financial perspectives of the UAE Government.

Table 3 shows key figures that demonstrate the KPIs of the EXPO 2020 Dubai as an event.

All participating countries did their best to showcase the best of their nation branding throughout the 6-month period, with focus on future development, sustainability of activities and future technologies. Table 4 highlights the features of national pavilions of some countries.

Table 3: Event key performance indicators of the EXPO 2020 Dubai

Event key performance indicator	Amount / figure / number
Total visitation	24,102,967 visitors
Repeated visitation	49% repeat visitors
Average duration of time on-site for domestic visitor	6.1h for domestic visitor
Average duration of time on-site for foreign visitor	6.5h for foreign visitor
Ticket sales level in pre-event phase	19% of all soled tickets
Total GVA to the UAE economy in period of 30 years	USD 42.2 billion
Total full-time jobs	1,039,000 full-time jobs

Source: [12, p. 478], [12, p. 486]

Table 4: Approaches to communicating national brands in various pavilions

Country	Key nation branding communication messages
UAE	• Introducing the UAE's rich culture and bright future. • The land of dreamers who do. • From its ancient roots as a crossroads for people, goods, and ideas, to its transformation into a unified nation, see the uniqueness of the UAE as a welcoming home to people from over 200 countries. • Featuring 6 different zones for an exceptional experience, a three-story structure totaling 15,064 sqm, design features based on 28 moveable wings. • Oasis – A fresh introduction to Emirati culture. • Falaj – A moment of connection and anticipation. • Desert of dreams – A multi-sensory journey through a rapidly changing landscape. • Description of the pavilion: pavilion demonstrated the UAE embraces openness, champions culture, nurtures entrepreneurship, and creates and shares knowledge for the benefit of all. The UAE Pavilion immerses visitors in the history and future of this nation – from its origins to its thriving present to the dreamers shaping an even better tomorrow for all.
Italy	• Experience a journey that takes you to the heart of Italy. • See how creativity comes from different places and disciplines in an unprecedented journey through the Italy of Beauty, touching on the country's extraordinary past, present and future. • An unforgettable experience that presents new educational, professional, and business opportunities. • Buildings, systems and technologies for sustainability, circular economy, and digital architecture. • Foster cooperation, participation, and development through cultural and scientific diplomacy. • Description of the pavilion: The Italian exhibition is following the pavilion's theme of "Beauty connects people." The pavilion has a 17-foot, 3D-printed reproduction of Michelangelo's famed David monument, as well as various other cultural and historical displays, with 160 flora species adorning the walks and walkways inside. Furthermore, the expo showcases a number of innovative Italian technologies that support circular economies and propose answers to environmental concerns.
Germany	• An engaging look at an environmental trailblazer • 'Enrol' at Campus Germany for an entertaining, surprising, hands-on digital experience. Based around a campus theme, Germany's pavilion blends creative environmental ideas with real-life results. • The 'edutainment' focused pavilion showcases German innovations and sustainable solutions. Visitors can wear cutting-edge connected devices as they explore themed areas including The Energy Lab, The Future City Lab and The Biodiversity Lab. • A restaurant serving German cuisine. • Description of the pavilion: Being a campus, the pavilion has three labs: the energy lab, the future city lab, and the biodiversity lab. In each lab, cutting-edge German sustainable technologies are presented. Visitors to the pavilion can learn about energy, smart cities, and biodiversity by visiting the three labs. Visitors are supposed to raise their environmental awareness at these labs through various communication channels such as interactive experiments, movies, and exhibits. A group of visitors swings in a vast room toward the end of the exhibition to demonstrate how we can transform our surroundings by working together.
Singapore	• It is hard to tell where nature begins and architecture ends. • Nature. Nurture. Future. • Showcasing Singapore's urban innovations, the net-zero energy pavilion designed by WOHA explores our journey towards livability and resilience. • An immersive 3-dimensional greenery experience. • A net-zero energy rainforest powered by a self-sustaining ecosystem • The Singapore story through interactive exhibits, programmes, and flavours • Description of the pavilion: Singapore's vision is to become a city in nature, and the exhibition is proof of that. Visitors to the pavilion enter through the ground garden that soothes the senses through the cool air, proper sunshine, and abundance of greenery. Visitors then watch a 360-degree, panoramic display in the city cone that presents challenges faced in large cities and how Singapore was able to defeat these challenges to become a city in nature. In addition to the city cone, the pavilion has rainforest and flower cones. On the one hand, the center piece of the rainforest cone is a mimic of the giant Dipterocarp tree's two-wing fruits that spin down during the fruiting season. On the other hand, the flower cone presents Singapore's orchid hybridization and conservation.
Spain	• Creating a more sustainable future for all. • Intelligence for life. • The Spain Pavilion aims to become an example of intelligent creativity, capable of uniting people around sustainable projects in the fields of science, technology, production, education, and art. • Iconic architecture that tempers high temperatures and highlights Spain's links with the Arab world. • An art installation leads to the theatre, where a fantastic story of collaboration is displayed. • An immersive exhibition gallery related to the goals of the 2030 Agenda for Sustainable Development.

Country	Key nation branding communication messages
Spain	• A country to live in – The Spain Pavilion will demonstrate the values and personality of the Spanish people – solidarity, creativity, innovation – along with what makes Spain attractive for tourists and investors, and the country's commitment to the theme of Expo 2020 Dubai. • Description of the pavilion: The exhibition's centerpiece, the Forest of Intelligence, is kept underground to save on cooling costs. The fake forest trees are made of special materials and can absorb CO2 and other greenhouse gases in the same manner that real trees can. Microalgae produced specifically for the pavilion also enhance oxygen levels, reduce global warming, can minimize future climate change effects, and are used to make biofuels and protein-rich diets. Other innovations concerning circular economies and closed-loop supply networks are also presented.
Netherlands	• Sustainable solutions through out-of-the-box creativity • Uniting water, energy, and food • Enter a miniature world with its own climate system. Brimming with sustainable solutions, the pavilion harvests water, energy, and food through innovations including a cone-shaped vertical farm. • Description of the pavilion: Through an immersive and engaging experience, visitors to the pavilion can learn about the biotope. A short film demonstrating how the biotope works are displayed on umbrellas handed to guests inside the cone. Waterfalls like rain from the top of the cone at the end of the 3-min show.

Source: [1], [15], [37]

Table 5: Serbia's approach to the communication of nation brand

Country	Key nation branding communication messages
Serbia	• Inspired by the past, shaping the future. • The ideas that changed, and are changing, humanity. • Serbia creates ideas! We celebrate 7,000 years of creativity and innovation on Serbian territory while shaping the future through our leading position in the world of innovation. • Explore amazing virtual exhibitions of Serbian ideas that changed and are still changing the world. • Discover why Serbia is called the 'Silicon Valley of the Balkans.' • Create your own avatar as you journey through the Serbian pavilion and interact in real-time – Dive into an inspiring Virtual Reality 'exhibition of exhibitions' of Serbian ideas including the great scientists, the treasures of the National Museum of Serbia, the Tesla Museum, and the City of Belgrade Museum, as well as Serbian contemporary art and design. • Discover our digital transformation – Learn how Serbia is leading the world in areas such as tech/ICT, start-ups and innovation, health and COVID-19 management, digital e-government, creative industries, agriculture and e-agriculture, and digital education. • Discover modern Serbia – Learn how Serbia is prioritizing innovation and creativity to find new solutions to some of the world's most pressing problems, and is in turn flourishing as a modern, dynamic, optimistic, and collaborative nation. • Learn how great ideas can change the trajectory of humanity – Discover how Serbian ideas have changed, and are changing, the world: from the creation of the first metals, through electricity and the radio, to climate science and early space exploration, to medical breakthroughs and Nobel Prizes. • Belgrade is ranked among the world's 5 most creative cities – Embrace modern Serbia as an open, collaborative, and fun nation full of creative, innovative, and imaginative people through our programme of events and live music. • Description of the pavilion: The Serbian pavilion consists of four parts. Serbia Creates • Ideas (Ground Floor): Retail zone of creative Serbian product plus BUSINESS – digital brochures of Serbian offerings, including presentations programme. Serbia Creates Opportunities – Inter-joining conference and meeting rooms of adjustable size and specification that can be booked for meetings, conferences, presentations. Serbia Creates Experiences – A tourism and events zone available for VR presentations of innovations, talents, artists, cities, tourism destinations, museums, major events etc. Serbia Creates Inspiration – A permanent exhibition connecting the genius of Vinča with the creativity and innovation of modern Serbia.

Source: [13], [17]

Serbia's participation at the EXPO 2020 Dubai

Serbia has been present on BIE World Expos for over 135 years, and over time, all participations have brought significant exposure to the country [16]. Table 5 shows Serbia's approach to the communication of nation brand.

Based on the available data, Table 6 indicates key performance indicators of Serbia's participation at the EXPO 2020 Dubai.

Conclusions

Combining available data on reached event performance indicators and communicated nation branding messages, it is possible to conclude that Serbia managed to communicate a new image of modern Serbia using traditional values and heritage during the EXPO 2020 Dubai. Compared to previous participations in world exhibitions, during the EXPO 2020, and based on the existing data on the official

Table 6: Serbia key performance indicators of participation at the EXPO 2020 Dubai

Event key performance indicator	Amount/figure/number
Total visitation	1,223,262 visitors
Total number of working days	191
Total number of events on the pavilion and EXPO ground	149
Total number of visitors on public events	Over 38,000
Total number of thematic business delegations from Serbia	9
Total number of Serbian companies in business delegations	Over 600
Total number of Serbian entrepreneurs and business owners in business delegations	Over 1,200
Total number of investment conferences	5
Total number of business contacts established through the pavilion activities	Over 10,000

Source: [17], [22], [11], [33], [34]

websites of the UAE and Serbia, it is evident that Serbia leveraged "soft power" and public diplomacy relations with the host country and managed to maintain and even increase the level of political-economic relations. At the same time, business and public diplomacy activities through official and business delegations demonstrated Serbia's strong interest to position itself as the hub of all scientific, business and development activities in the Western Balkan region, and to spread the joint global values, such as unity, peace, collaboration, and the improvement of the well-being.

References

1. Al-Shihabi, S., Aydin, R., Hadj-Alouane, A. & Alshanasi, A. (2023). Sustainable technologies, mega-events, and environmental awareness - Lessons from Expo 2020 Dubai. *Frontiers in Sustainable Cities*, *5*, 1-11.
2. Ang, I., Isar, R.Y. & Mar, P. (2015). Cultural diplomacy: beyond the national interest? *International Journal of Cultural Policy*, *21*(4), 365-381.
3. Anholt, S. (2007). *Competitive identity: The new brand management for nations, cities and regions*. Palgrave Macmillan, Basingstoke.
4. Bolin, G. & Miazhevich, G. (2018). The soft power of commercialised nationalist symbols: Using media analysis to understand nation branding campaigns. *European Journal of Cultural Studies*, *21*(5), 527-542.
5. Bureau International des Expositions. (BIE). *What is an Expo?* Retrieved from https://www.bie-paris.org/site/en/#
6. Bureau International des Expositions (BIE). *Protocol amending the Convention signed at Paris on the 22nd November 1928 relating to the international exhibition*. Retrieved from https://www.bie-paris.org/site/images/stories/files/BIE_Convention_eng.pdf
7. Bureau International des Expositions (BIE). Retrieved from https://www.bie-paris.org/site/en/world-expo-2030#
8. Chen, Y., Tu, Q. & Su, N. (2014). *Shanghai's Huangpu riverbank redevelopment beyond World EXPO 2010*. 2014 AESOP Annual Conference at Utrecht and Delft, the Netherlands (pp. 1-17).
9. Cull, N. J. (2022). The Greatest Show on Earth? Considering Expo 2020 Dubai. *Place Branding and Public Diplomacy*, *18*, 49-51.
10. De Groote, P. (2005). A multidisciplinary analysis of world fairs (= expos) and their effects. *Tourism Review*, *60*(1), 12-19.
11. Euronews Serbia. (2022, April 2). *Paviljon Srbije na EXPO 2022 čista desetka: Beograd kandidat za domaćina mini izložbe 2027. godine*. Retrieved from https://www.euronews.rs/kultura/aktuelno-iz-kulture/43305/paviljon-srbije-na-expo-2022-cista-desetka-beograd-kandidat-za-domacina-mini-izlozbe-2027-godine/vest
12. EXPO 2020 Dubai. (2022). *The EXPO 2020 Dubai Story – EXPO Closing Report*. EXPO 2020 Dubai UAE & BIE
13. EXPO 2020 Dubai. (n.d.). *Serbia Pavilion*. Retrieved from https://www.expo2020dubai.com/en/understanding-expo/participants/country-pavilions/serbia
14. EXPO 2020 Dubai. (n.d.). *Sustainability Report 2019: Connecting Minds, Creating the Future*. Retrieved from https://www.expo2020dubai.com/-/media/expo2020/sustainability/expo2020-sustainability-report-2019-en.pdf
15. EXPO 2020 Dubai. (n.d.). *Understanding EXPO/Participants/Country Pavilions*. Retrieved from https://www.expo2020dubai.com/en/understanding-expo/participants/country-pavilions
16. EXPO Serbia. (n.d.). *Serbia at world exhibitions*. Retrieved from https://exposerbia.rs/en/expo-history-serbia.php
17. EXPO Serbia. (n.d.). *Serbia Creates Ideas*. Retrieved from https://exposerbia.rs/en/index.php
18. Fan, Y. (2008). Soft power: power of attraction or confusion? *Place Branding and Public Diplomacy*, *4*(2), 147-158.
19. Fraser, C. (2003). Change in the European Industrial City. In C. Couch, C. Fraser, and S. Percy, (eds.), *Urban Regeneration in Europe* (p. 20). Oxford: Blackwell.
20. Gunek, A. (2018). A New Type of Soft Power: Country Branding. *International Journal of Cultural and Social Studies (IntJCSS)*, *4*(1), 252-259.
21. Haneef, S. K., Ansari, Z. & Bhavani, G. (2019). Attractions of Dubai and Expo 2020: An exploratory study. *Worldwide Hospitality and Tourism Themes*, *11*(3), 266-278.
22. InStore Media. (2022, April 1). *Zatvoren EXPO 2020 Dubai*. Retrieved from https://www.instore.rs/sr/article/44421/zatvoren-expo-2020-dubai
23. Jing, Yu. (2010). *Study on the Adaptability of Urban Design of the World EXPO*. 46th ISOCARP Congress 2010.
24. Johnston, K. (2008). The relevance, scope and evolution of nation branding: Country Case Insight – South Africa. In Dinnie, K. (ed), *Nation branding: Concepts, Issues, and Practice*. Oxford: Butterworth Heinemann.

25. Kotler, P. (2002). Country as brand, product, and beyond: a place marketing and brand management perspective. *Journal of Brand Management*, *9*(4-5), 249-261.
26. Künzli, N., Puhan, M.A. & Suggs, L.S. (2019). Will the Swiss pavilion at Expo 2020 Dubai damage your health? *International Journal of Public Health*, *64*, 1125-1126.
27. Lamberti, L., Noci, G., Guo, J. & Zhu, S. (2011). Mega-events as drivers of community participation in developing countries: The case of Shanghai World Expo. *Tourism Management*, *32*, 1474-1483.
28. Lin, L. & Hongtao, L. (2017). Joseph Nye's Soft Power Theory and Its Revelation Towards Ideological and Political Education. *Humanities and Social Sciences*, *5*(2), 69-74.
29. Manor, I. (2019). *The Digitalization of Public Diplomacy*. Palgrave Macmillan Series in Global Public Diplomacy.
30. Naparat, M. (2012). Analysis of the Swedish Pavilion at the World Exposition 2010 in Shanghai Through Latour's Actor-Network Theory. Master's programme in International Museum Studies School of Global Studies Gothenburg University, pp. 1-76.
31. Nye, J. S. (1990). *Bound to Lead: The Changing Nature of American Power*. Basic Books, New York, USA.
32. Pilon, J. C. (2005). Book review "Soft power: the means to success in world politics". *Mediterranean Quarterly*, Spring, 125-131.
33. Privredna komora Srbije. (2022, March 31). Danas se zatvara EXPO 2020 Dubai. Retrieved from https://pks.rs/vesti/spusta-se-zavesa-na-expo-2020-dubai-6161
34. Razvojna agencija Srbije. (2022, March 22). Paviljon Srbije na EXPO 2020 dočekao milionitog posetioca pred sam kraj Svetske izložbe u Dubaiju. Retrieved from https://ras.gov.rs/paviljon-srbije-na-expo-2020-docekao-milionitog-posetioca-pred-sam-kraj-svetske-izlozbe-u-dubaiju
35. Singh, B. (2015). Smart city-smart life - Dubai Expo 2020. *Middle East Journal of Business*, 10(4), 49-52
36. Tudor, A. (2022). From London to Dubai – 171 years of national branding through World Expos (1851-2022). *Europolity*, *16*(1), 129-152.
37. UAE Pavilion. (n.d.). *A Symbol of the UAE's Bold and Daring Spirit*. Retrieved from https://uaepavilionexpo.com/about-us/the-pavilion/
38. Vij, M., Upadhya, A., Vij, A. & Kumar, M. (2019). Exploring Residents' Perceptions of Mega Event-Dubai Expo 2020: A Pre-Event Perspective. *Sustainability*, *11*(5), 1-17.
39. Windsor, B. (2000). Hard Power, Soft Power Reconsidered. *Canadian Military Journal*, 2000, Autumn, 51-56.
40. Wu, Z. (2009). *Sustainable planning and design for the world expo 2010 Shanghai Chin*a. Beijing: China architecture Press.

Igor Kovačević

is an associate professor at the Faculty of Economics and Business, University of Belgrade. He lectures in business economy and management (Destination Management, Event Management, Marketing in Tourism) and in the area of economic policy and development (Tourism Economics). His academic and professional interests are focused on tourism marketing and management, with special emphasis on the meetings industry (MICE), events, business travel, and the creative economy. Igor also served as the Pavilion Director of the Republic of Serbia Pavilion at Dubai EXPO 2020.

Branislava Hristov Stančić

is an assistant professor at the Faculty of Economics and Business in Belgrade. She lectures in business economy and management (Management of Tourism and Hospitality Enterprise, Revenue Management, Marketing Management) and in the area of economic policy and development (Tourism Economics). Her academic and professional interests are focused on hotel management, hotel operations, revenue management.

Bojan Zečević

is a full professor at the Faculty of Economics and Business, University of Belgrade. He has received professional and advanced training from some of the major universities in Europe and the USA in the field of tourism and, in particular, of modern tourism management. At the bachelor's level of studies, his teaching commitments include the courses of Tourism Economics and Marketing in Tourism. As for the master's studies, he has developed and teaches the Tourism Management module. He is an active member of scientific and professional organizations from the field of international and domestic tourism.

MEMBERS OF THE SERBIAN ASSOCIATION OF ECONOMISTS

ADDIKO BANK A.D. BEOGRAD
BEOGRAD, MILUTINA MILANKOVIĆA 7V
TEL: 011/222-67-13
FAX: 011/222-67-98
www.addiko.rs

BUCK
11147 BEOGRAD, p.f. 2, SRBIJA
TEL: 011/2052-400
FAX: 011/2052-401
www.buck.rs

AGENCIJA ZA OSIGURANJE DEPOZITA
BEOGRAD, KNEZ MIHAILOVA 2/I
TEL: 011/2075 102
FAX: 011/3287 741
www.aod.rs

"DDOR NOVI SAD" A.D.O. Novi Sad
Deo Unipol Gruppo S.p.A.
NOVI SAD, BULEVAR MIHAJLA PUPINA 8
TEL: 021/4871-000
0800/303-301
www.ddor.co.rs

ATLANTIC GRUPA
BEOGRAD, KUMODRAŠKA 249
TEL: 011/395 6007
FAX: 011/2472-628
www.atlanticgrupa.com

DUN & BRADSTREET D.O.O. BEOGRAD
BEOGRAD, Bulevar Vojvode Bojovića 6-8
TEL: +381 60 3788 868
www.dnb.com

BANCA INTESA AD BEOGRAD
NOVI BEOGRAD, MILENTIJA POPOVIĆA 7B
TEL: 011/2011-200
FAX: 011/2011-207
www.bancaintesabeograd.com

ELEKTROPRIVREDA SRBIJE
BEOGRAD, CARICE MILICE 2
TEL: 011/2628-622
FAX: 011/2623-984
www.eps.rs

MEMBERS OF THE SERBIAN ASSOCIATION OF ECONOMISTS

NOVI BEOGRAD, ANTIFAŠISTIČKE BORBE 13a
TEL: 011/2095-808
FAX: 011/2095-890
www.ey.com/rs

MEDIGROUP SEE
NOVI BEOGRAD, PARISKE KOMUNE 26
TEL: 011/4040-100
http://bolnica.medigroup.rs/

ERSTE BANK
NOVI SAD, BULEVAR OSLOBOĐENJA 5
NOVI BEOGRAD, MILUTINA MILANKOVICA 11B
TEL: 0800 201 201
FAX: 021/480 97 00
www.erstebank.rs

MEĐUNARODNI CENTAR ZA RAZVOJ FINANSIJSKOG TRŽIŠTA DOO
BEOGRAD, NEBOJŠINA 12
TEL: 011/3085-780
FAX: 011/3085-782
www.mcentar.rs

EUROBANK DIREKTNA a.d.
BEOGRAD, VUKA KARADŽIĆA 10
TEL: 011/206-5816
FAX: 011/302-8952
www.eurobank-direktna.rs

MERKUR OSIGURANJE A.D.O. BEOGRAD
NOVI BEOGRAD, BULEVAR MIHAJLA PUPINA 6
TEL: 011/785 27 27
FAX: 011/785 27 28
www.merkur.rs

JEDINSTVO
UŽICE, PRVOMAJSKA BB
TEL: 031/533-681
FAX: 031/533-685
www.mppjedinstvo.co.rs

MET SRB d.o.o.
BULEVAR ZORANA ĐINĐIĆA 48b/II sprat
TEL: 011/4094-930
FAX: 011/4094-932
www.MET.com

NLB GRUPA
BEOGRAD, SVETOG SAVE 14
TEL: 011/3080-100
FAX: 011/3440-033
www.nlbkb.rs

RAIFFEISEN FUTURE A.D. BEOGRAD
DRUŠTVO ZA UPRAVLJANJE
DOBROVOLJNIM PENZIJSKIM FONDOM
NOVI BEOGRAD, ĐORĐA STANOJEVIĆA 16
TEL: 011/220-7180
FAX: 011/220-7186
www.raiffeisenfuture.rs

AD "NOVOSADSKI SAJAM" NOVI SAD
NOVI SAD, Hajduk Veljkova 11
TEL: 021/483-00-00
https://sajam.net/sr/

ROCHE SRBIJE
NOVI BEOGRAD, MILUTINA MILANKOVIĆA 11A
TEL: 011/2022-860
www.rochesrbija.rs

OTP BANKA SRBIJA AD BEOGRAD
NOVI BEOGRAD, BULEVAR ZORANA ĐINĐIĆA 50a/b
TEL: 011/3011-555
www.otpsrbija.rs

SAVA NEŽIVOTNO OSIGURANJE a.d.o.
BEOGRAD, BULEVAR VOJVODE MIŠIĆA 51
TEL: 011/3644-801
FAX: 011/3644-889
www.sava-osiguranje.rs

POINT GROUP Int doo
BEOGRAD, FRANCUSKA 6
TEL: 011/7346 661
FAX: 011/7234 431
www.pointint.com

JP SRBIJAŠUME
NOVI BEOGRAD, BULEVAR MIHAJLA PUPINA 113
TEL: 011/311-5036
FAX: 011/311-5036
www.srbijasume.rs

MEMBERS OF THE SERBIAN ASSOCIATION OF ECONOMISTS

SRPSKA BANKA A.D.
BEOGRAD, SAVSKA 25
TEL: 011/3607-200
www.srpskabanka.rs

UNIVERZITET U BEOGRADU
EKONOMSKI FAKULTET
BEOGRAD, KAMENIČKA 6
TEL: 011/3021-240
FAX: 011/2639-560
www.ekof.bg.ac.rs

TRANSNAFTA AD
NOVI SAD, Bulevar oslobođenja 5
TEL: 021/3861-000
www.transnafta.rs

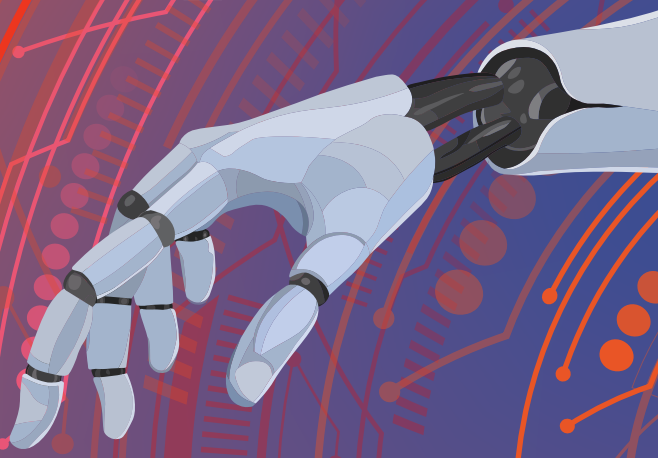
JAVNO PREDUZEĆE „VOJVODINAŠUME“
PETROVARADIN, PRERADOVIĆEVA 2
TEL: 021/431-144, lokal 125
FAX: 021/431-144, lokal 217
www.www.vojvodinasume.rs

TRIGLAV OSIGURANJE A.D.O.
NOVI BEOGRAD, MILUTINA MILANKOVIĆA 7a
TEL: 011/3305-100
FAX: 011/3305-138
www.triglav.rs

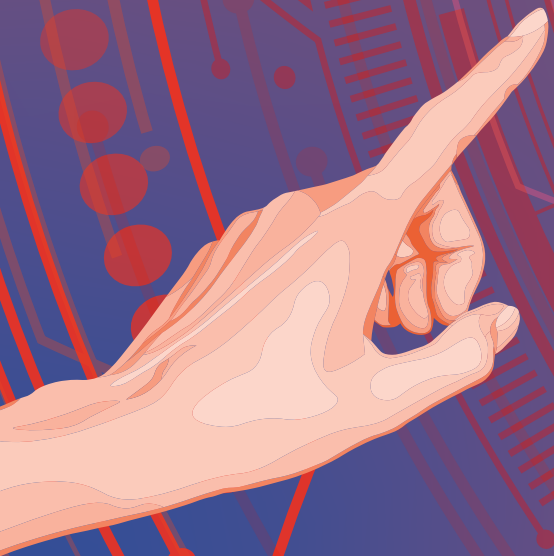
UNICREDIT BANK
BEOGRAD, RAJIĆEVA 27-29
TEL: 011/3777-888
http://www.unicreditbank.rs

WIENER STÄDTISCHE OSIGURANJE A.D.O. BEOGRAD
VIENNA INSURANCE GROUP
BELGRADE, TREŠNJINOG CVETA 1
TEL: +381 11 2209 800
FAX: +381 11 2209 900
http://www.wiener.co.rs

TeleGroup



We
Create
the
Future.
Together.

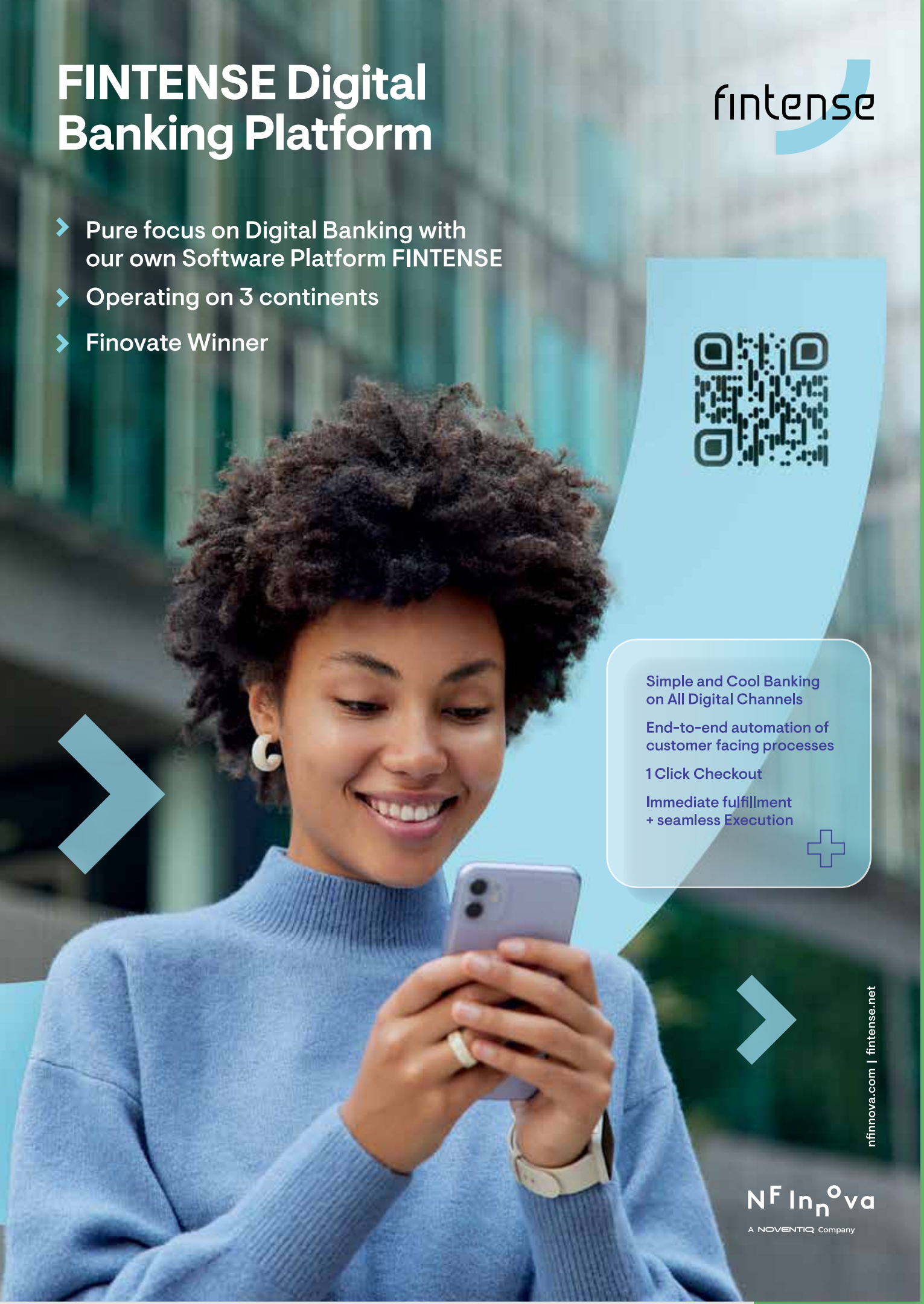


Svetozara Miletića 9a
11000 Beograd, Srbija
T: +38111 3081 981
www.telegroup-ltd.com

FINTENSE Digital Banking Platform

fintense

- Pure focus on Digital Banking with our own Software Platform FINTENSE
- Operating on 3 continents
- Finovate Winner



Simple and Cool Banking on All Digital Channels

End-to-end automation of customer facing processes

1 Click Checkout

Immediate fulfillment + seamless Execution

nfinnova.com | fintense.net

NF Innova
A NOVENTIQ Company