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Izdavač:

UNIVERZITET EDUKONS, Fakultet poslovne ekonomije,
Vojvode Putnika 87, Sremska Kamenica, Novi Sad
Tel: 021/489-3647, 489-3611
e-mail: redakcija@educons.edu.rs
www.educons.edu.rs

Za izdavača:

Prof. dr Aleksandar Andrejević, Rektor

Glavni i odgovorni urednik:

Prof. dr Marko Malović

Članovi izdavačkog odbora:

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Vesna Martin,¹ PhD

Economists Association of Belgrade, Serbia

CAPITAL BUFFERS AND LENDING DURING A CRISIS: CASE STUDY OF SERBIA

ABSTRACT: Capital buffers ensure that banks have the capacity to absorb any losses in the event of a financial crisis. Maintaining capital buffers at a high level enables banks to continue lending during times of crisis, protecting the stability of the financial system. On the other hand, banks may decrease lending activity in order to maintain capital adequacy if capital buffers are set at a low level, which could exacerbate the economic downturn. To guarantee economic recovery, it is therefore essential to find a balance between establishing and maintaining financial stability and credit activity during times of crisis.

The capital buffers that banks in the Republic of Serbia have been required to set aside since Basel III was implemented will be analyzed in this paper, along with an examination of the lending activity trend during times of crisis, including the coronavirus pandemic, the energy crisis, high inflation, and significant geopolitical tensions. As loaning activity recovered, the research revealed that the Republic of Serbia's banking sector maintained adequate capitalization during periods of severe crisis.

Key words: capital buffers, lending activity, monetary policy, macroprudential policy

¹ martin0803@hotmail.com

INTRODUCTION

Capital buffers are the additional capital that banks must hold above the regulatory minimum. These allocations are crucial because capital buffers shield banks from adverse financial conditions and operate as a safety net against possible losses, allowing banks to continue operating profitably while preserving the effectiveness of all their operations. During times of economic difficulty, banks are more vulnerable to credit risk because borrowers may find it difficult to meet their credit obligations on time due to the crisis. Therefore, capital buffers can assist banks in covering possible losses without significantly lowering lending activity. Regulators also demonstrate flexibility during a crisis, allowing banks to reduce their capital requirements in order to continue providing credit.

Capital buffers are a tool used by central banks, whose primary responsibility is to ensure financial stability. As a result, central banks have the flexibility to modify capital buffer allocations during times of crisis in order to sustain credit activity, which is crucial for the expansion of economic activity. Additionally, the central bank uses a variety of scenarios in stress tests to evaluate the resilience of banks and to determine whether the bank will continue to have enough capital during a stress period.

This paper examines how capital buffers and loan activity are adjusted in the Republic of Serbia during times of crisis, including the coronavirus outbreak, the energy crisis, and the ensuing high inflation and geopolitical tensions. The analysis will cover the time frame from 2020 through the second quarter of 2024. A review of the literature will follow the introductory note. An analysis of capital buffers and credit activity during the crisis is covered in the third section of the paper, which also looks at how capital buffers affect the implementation of monetary and macroprudential policies. The examination of future credit activity trends is presented in the fifth section of the paper, and the conclusion provides a summary of the key findings.

LITERATURE REVIEW

Macroprudential policy's primary objective is to ensure that banks are resilient and ready to absorb possible losses while simultaneously sustaining lending activity during times of elevated stress, which helps the financial system run smoothly. The application of capital buffers, which include buffers for globally systemically important institutions and other systemically important institutions, the systemic risk buffer, the capital conservation buffer, and the countercyclical capital buffer, is seen by the banking sector as

the primary tool of macroprudential policy. According to Cappelletti et al. (2019, p. 4), these capital buffers are additional Common Equity Tier 1 (CET1) capital that banks must hold above the required regulatory minimum. To improve the effectiveness of banks' ability to absorb losses, there needs to be an increase in the quantity and quality of capital from the perspective of macroprudential policy implementation. The Basel Committee focused on two aspects—procyclicality and mutual connectivity among banks—to lessen systemic damage (Caruana, 2012, p. 3). To create capital buffers that will help with future investments, Bui et al.'s analysis (2017, p. 26) demonstrated that it is vital to evaluate the appropriate level of capital buffers in relation to the risk of prospective losses to contribute to greater resilience of the financial system. The effects of adjustments to macroprudential regulatory requirements on credit activity and the capital ratio of UK banks between 1990 and 2011 were examined by Bridges et al. (2014, p. 16). The analysis demonstrated how regulatory capital requirements increase capital allocations, causing banks to create capital buffers over the regulatory minimum, which in turn affects banks' capital ratios. There was a varied reaction to the increase in capital allocations in terms of credit activity, with a decline in secured lending to the household sector and a decline in loan activity in the commercial real estate sector in the year that followed.

Prior to the crisis brought on by the coronavirus pandemic, an analysis by Lewrick et al. (2020, p. 4) revealed that banks had nearly US\$5 trillion in capital above the Pillar 1 regulatory requirements and a CET1 capital ratio of 14.0%, which was significantly higher than the regulatory minimum of 8%. Out of that total, US\$2.7 trillion was allocated to capital buffers, of which US\$270 billion could be used to finance credit activities. Numerous actions were taken during the European coronavirus pandemic to address the consequences of that event. One such measure was implemented by the European Central Bank, which allowed systemically important institutions to temporarily operate below Pillar 2, the level of capital that the bank expects institutions to maintain in order to ensure that they have the capacity to absorb losses resulting from unfavorable scenarios. As a result, the European Central Bank allowed banks to utilize capital relief measures from both the countercyclical capital buffer and the capital conservation buffer (Dursun-de Neef, 2023, p. 4).

The use of capital buffers was justified during times of crisis because, under normal circumstances, their use would be viewed as a warning sign and lead to regulatory constraints, including restricting or outlawing dividends, bonus payments, and share buybacks. Addressing the capital shortfall is required in the event that the bank reports one. This can be accomplished in a number of ways, including by raising share capital, selling securities, or cutting back on lending. It is more costly to increase capital

through an expansion of core capital, particularly in times of crisis when banks have to absorb losses. Reducing credit activity by making credit less accessible and raising financing costs is a more plausible course of action, which could be harmful to the overall economy (Maurin and Toivanen, 2015, p. 114). Following the global financial crisis of 2007-2009, regulatory capital reform was put into effect, followed by discussions over how increased regulatory capital requirements might affect credit and real activity. The cost of the capital requirements reform reduced bank lending activity, even as it increased the quantity and quality of banking capital and strengthened the resilience of the banking sector. Berrospide and Edge (2019, p. 33) demonstrated that a one percentage point increase in capital buffers results in a nearly two percentage point decrease in credit activity for utilized credit and a 0.5 percentage point decrease for committed loans, using the example of large banks in the USA between 2012 and 2016.

Nonetheless, a decrease in loan activity does not necessarily coincide with a shift in capital requirements. When there are robust lending prospects and strong bank performance, credit activity can be less susceptible to changes in capital requirements, according to an analysis by Bahaj et al. (2016, p. 18) based on data from the United Kingdom during the period 1989 to 2007. Sivec and Volk (2023, p. 142) used Slovenia as an example to demonstrate how the Bank of Slovenia released capital buffers in 2006, amounting to 0.8% of risk-weighted assets. Banks with higher capital allocation levels saw credit growth of 5–11 percentage points as a result. Achieving equilibrium in capital allocation in accordance with Basel III regulations is crucial, as is preserving credit activity that has a direct impact on real economic activity. The impact of capital buffers on the execution of monetary and macroprudential policies will be discussed in the next section of the paper.

CAPITAL BUFFER IMPACT ON MONETARY AND MACROPRUDENTIAL POLICY

Coordination of monetary and macroprudential policy can decrease uncertainty regarding decisions taken by the central bank and regulatory bodies, as well as increase macroeconomic and financial stability in response to specific shocks (Jonsson and Moran, 2014, p. 16). To achieve financial stability and maintain the monetary policy transmission mechanism, regulators must take into account the relationship between capital requirements and bank credit activity (Reghezza, 2020, p. 3). The objective of monetary policy implementation after the global financial crisis was to loosen credit requirements while keeping in mind how credit activity affects

a nation's ability to expand and develop economically. Evaluating how rising interest rates may affect banks' credit activities presents several challenges. Three major challenges were identified in an analysis by Cappelletti et al. (2019, p. 16). The first relates to how capital requirements vary. Changes in capital requirements typically affect the banking sector as a whole, making it nearly impossible to determine how each individual bank will be impacted. Second, in certain situations, supervisors establish unique capital requirements for banks, preserving the distinctiveness of each bank. Third, it's important to distinguish between the supply and demand of loans in order to evaluate how capital requirements affect banks' credit activities.

In their study, Rubio and Carrasco-Gallego (2015, p. 5) examined the relationship between Basel regulation and monetary policy, as well as how the ideal monetary policy fluctuates depending on the capital requirement ratio (CRR). Applying the Basel standards aims to limit the risks that banks take on, curb the excessive expansion of loans during prosperous times, and prevent the contraction of loan supply during economic crises. This would lessen the procyclicality of the banking sector (Couaillier et al., 2022, p. 5). Gambacorta and Song Shin (2016, p. 22) examined how bank leverage can influence bank lending in response to monetary policy shocks. The aforementioned authors began by discussing the lending channel used by banks and argued that the implementation of restrictive monetary policy affects these activities because the decrease in deposit reserves cannot be made up for by the monetization of certain assets. It is vital to give investors an adequate premium because the market for bank debt is not one in which these products can be easily sold. In these situations, bank capital is crucial since the quantity and quality of capital directly impact banks' creditworthiness, informing investors about the institution's rating. The aforementioned authors raised the question of how bank capitalization can impact credit activity, suggesting that further research should explore the relationship between bank capitalization and loan supply. They concluded that two mechanisms are at play: (1) banks can finance profitable investments with their excess capital, or capital beyond the regulatory minimum; in other words, they can use this capital to maintain credit activity in the event of adverse shocks, such as monetary tightening; and (2) banks with sufficient capital are viewed as less risky by investors and depositors and have easier access to less expensive sources of financing, including bonds or uninsured deposits. Ensuring that banks have adequate capitalization is critical, as insufficient capital could create a conflict between the supervisor's objective of guaranteeing the safety and stability of bank operations—which can be achieved even at the expense of reduced credit activity—and the monetary policy's attempts to promote credit activity.

Given their significance in maintaining the stability of the banking sector's operations during periods of elevated financial stress, capital buffers have a significant impact on the application of macroprudential policy. It is important to note that the global financial crisis of 2007–2009 highlighted the limitations of monetary policy in mitigating its effects, which prompted the creation of macroprudential policy. Following the coronavirus pandemic, global geopolitical tensions led to high inflation and the implementation of tightened monetary policy, which drove up borrowing costs and created challenging conditions for debt repayment. Credit default swaps, which reached record levels of activity, and the issue of collateralized debt obligations were the mechanisms by which credit risk was transferred throughout the financial system (Benbouzid et al., 2022, p. 6). The above-mentioned factors contributed to increased systemic stress, which in turn affected the financial system's stability. The banking sector's view of credit risk has drastically shifted since the global financial crisis, heightening concerns that borrowers may not be able to fulfill their loan obligations. Capital buffers are the primary innovation introduced by Basel III, which successfully addressed regulatory gaps from the pre-crisis era and established a regulatory structure designed to develop a stronger financial sector capable of supporting the real economy. Because they serve as a buffer against financial stress and reduce procyclicality, capital buffers are crucial in particular circumstances (Behn et al., 2020).

Behn and Hannes Lang (2023) highlight the significance of capital buffers for the implementation of macroprudential policy, particularly during times of heightened stress. According to these authors, during times of elevated volatility, capital-based macroprudential tools should prioritize maintaining the banking sector's resilience. Under these circumstances, there is an increased likelihood that accumulated instability will materialize, posing a risk to financial stability. This underscores the need for macroprudential authorities to closely monitor risks and respond promptly to prevent their materialization. Drehmann et al. (2020, p. 5) emphasized the importance of macroprudential policy during the coronavirus pandemic and stated that by permitting the use of capital buffer funds, officials made it clear that they were committed to reversing the pandemic's effects. Consequently, macroprudential policy measures complemented monetary and fiscal policy actions. Macroprudential regulators ensured that banks had both the capacity and flexibility to utilize released capital buffers in order to prevent a decline in lending activity to the real sector. Given that recession losses take longer to manifest, this allowed banks to play a role in supporting the loan supply during the recovery phase. These points highlight the significance of capital buffers in the execution of monetary and macroprudential policies, both of which aim to bolster the banking sector's resilience.

CAPITAL BUFFERS AND LENDING ACTIVITY DURING THE CRISIS IN SERBIA

Similar to almost every other country worldwide, Serbia dealt with the coronavirus pandemic by enacting lockdown measures, disrupting supply chains, and implementing a significant package of fiscal incentives to help households and businesses. In response, monetary policy lowered the key policy rate while simultaneously increasing dinar and foreign currency liquidity via swap and repo transactions. A phase of heightened geopolitical uncertainty ensued, followed by an energy crisis and higher-than-target inflation rates. This section of the paper will analyze the application of capital buffers and the changes observed in the Republic of Serbia's credit activity between the beginning of 2020 and the second quarter of 2024.

Capital buffers analysis

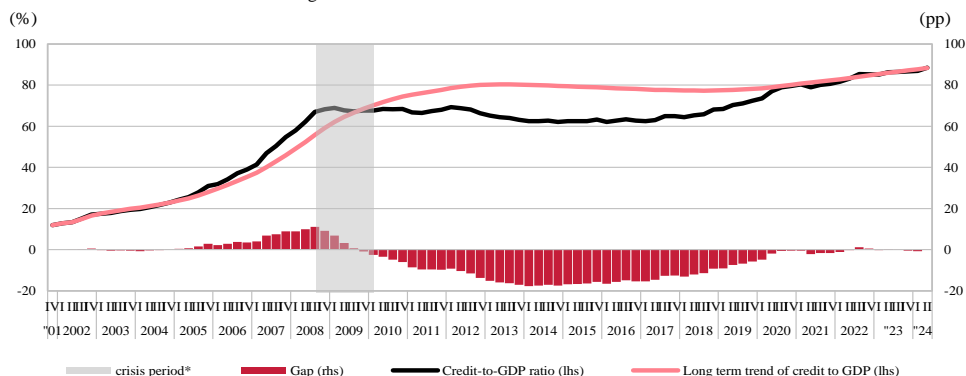
According to Milojević (2011, p. 171), the adoption of the Basel standards has resulted in a noteworthy development that requires sufficient attention: the impact of the standards on capital requirements and their effect on banks' capital allocations. The primary innovation of Basel III is the implementation of capital buffers, which enhance the quality of capital and bolster the banking sector's resilience. The Republic of Serbia adopted the Basel III standard in December 2016 when the National Bank of Serbia approved numerous regulations. The Directive on Capital Requirements for Credit Institutions (2013/36/EU) was incorporated through the Decision on Capital Adequacy of Banks, which is referenced in the Republic of Serbia's capital buffer regulation. As of June 30, 2017, banks in the Republic of Serbia are required to maintain the following capital buffers: the capital conservation buffer, countercyclical capital buffer, capital buffer for systemically important banks, and systemic risk buffer. By the end of 2023, banks in the Republic of Serbia held combined capital buffers, including the capital conservation buffer, countercyclical capital buffer, capital buffer for systemically important banks, and systemic risk buffer, amounting to 190.4 billion dinars, or 5.8% of risk-weighted assets.

The Decision on Capital Adequacy of Banks, specifically Article 434, mandates that banks maintain a *capital conservation buffer* equal to 2.5% of their risk-weighted assets on an individual and consolidated basis. Serbia has maintained a capital conservation buffer of 2.5% of risk-weighted assets since its inception (Author, 2021). The National Bank of Serbia's Decision on

Temporary Measures for Banks to Facilitate Access to Financing for Natural Persons permitted banks to deduct specific credit risk-weighted exposures from their risk-weighted assets for the purpose of calculating the capital conservation buffer until December 31, 2023. Because banks are encouraged to approve housing loans without waiting for the residential building to be at least 60% completed or fully finished, the objective of this measure was to make it easier for citizens to access housing loans and thereby support the real sector, specifically the construction sector.

Articles 435–445 of the Decision on Capital Adequacy of Banks govern the *countercyclical capital buffer*. These articles state that banks must keep a countercyclical capital buffer equal to their risk-weighted assets multiplied by the specific rate of the countercyclical capital buffer, which is the weighted average rate of the countercyclical capital buffer for the Republic of Serbia and other nations where the bank has relevant credit exposures. Banks must maintain this buffer both on an individual and consolidated basis. The Republic of Serbia's countercyclical capital buffer rate is established by the National Bank of Serbia and ranges from 0% to 2.5% of the bank's risk-weighted assets; in extraordinary cases, the National Bank of Serbia may set a rate higher than 2.5% of the bank's risk-weighted assets if deemed necessary (Author, 2022). By computing a reference indicator that reflects the real credit-to-GDP ratio and its deviation from the long-term trend, the National Bank of Serbia establishes the rate of the countercyclical capital buffer on a quarterly basis. At the National Bank of Serbia's Executive Board meeting on September 12, 2024, the rate of the countercyclical capital buffer was last reviewed and determined to remain at 0%. This decision was made with the understanding that, according to data from June 2024, the share of total real credit in the GDP is 88.5%, and that this share's deviation from its long-term trend is only 0.2 percentage points. The estimated value of the gap is below the limit of 2 percentage points, which is a reference threshold that may indicate excessive credit activity (Chart 1).

Chart 1. Credit-to-GDP ratio and its long run trend



Source: National Bank of Serbia

If the real loan-to-GDP share is at least 2 percentage points greater than its long-term trend and the rate of credit growth is not consistent with economic growth, it is considered excessive. Because it generates an additional capital buffer during periods of sharp credit expansion, which can be released when systemic risks materialize, the adoption of this capital buffer plays a role in mitigating the cyclical dimension of systemic risk. The countercyclical capital buffer was introduced in 2017, and since then, its rate has remained at 0%. The National Bank of Serbia is attempting to support credit activity, which is crucial during periods of pronounced uncertainty, such as those that Serbia has experienced since 2020 due to the emergence of the coronavirus and subsequent geopolitical uncertainties, exposure to the energy crisis, and higher-than-target inflation rates.

The capital buffer for a systemically important bank is governed by the Decision on Capital Adequacy of Banks' Articles 452 and 453, which state that the National Bank of Serbia must examine this capital buffer and the process used to determine it at least once a year. The National Bank of Serbia considers several factors, including the bank's size, its significance to the Republic of Serbia's economy, and the importance of its cross-border operations, when determining whether a bank is systemically significant. The relationship and significance of a particular bank within the financial system, along with the complexity of its operations, are also examined. The National Bank of Serbia sets the capital buffer rate for systemically important banks, which ranges from 0% to 2% of the bank's risk-weighted assets. At its meeting on May 10, 2024, the Executive Board of the National Bank of Serbia established the rates that systemically significant banks must adhere to beginning on June 30, 2024. Nine banks—four with a capital buffer rate of

2% and five with a rate of 1%—have been identified as systemically important for the Republic of Serbia (Table 1).

Table 1. The list of systemically important banks in the Republic of Serbia and rates of the capital buffer rates for systemically important banks

Bank	Capital buffer rate for systemically important banks
BANCA INTESA	2%
OTP BANKA	2%
AIK BANKA	2%
UNICREDIT BANK	2%
NLB KOMERCIJALNA BANKA	1%
RAIFFEISEN BANKA	1%
BANKA POŠTANSKA ŠTEDIONICA	1%
ERSTE BANK	1%
EUROBANK DIREKTNA	1%

Source: National Bank of Serbia

The systemic risk buffer is prescribed in the Decision on the Rate and Manner of Maintaining the Systemic Risk Buffer, in addition to the Decision on Capital Adequacy of Banks. At least every two years, the necessity of maintaining this capital buffer is reviewed. During the last review in March 2024, the systemic risk buffer's rate was set at 3% of all foreign currency and foreign currency-indexed bank placements made to corporates and households in the Republic of Serbia. This rate has remained at this level ever since this capital buffer was introduced. To mitigate the systemic risk associated with euroization, a systemic risk buffer was implemented. Banks must keep a systemic risk buffer if their total placements to households and corporates in the Republic of Serbia account for more than 10% of all placements to corporations and households in the country that are denominated in foreign currency and foreign currency-indexed. Thus, to reduce allocations for this capital buffer, banks are incentivized to lower the share of foreign currency and foreign currency-indexed placements to corporates and households in the Republic of Serbia at the same time.

In particular, the Republic of Serbia has a high level of euroization, with placements at 63.9% and deposits at 55.8% as of the end of June 2024. Since a degree of euroization above 40% is deemed high, according to Windischbauer's analysis (2016, p. 18) applied to data from the Western Balkan countries, to which Serbia also belongs, the risk of euroization remains one of the major structural systemic risks to the stability of the banking sector in the Republic of Serbia. The Decision on Temporary

Measures for Banks to Facilitate Access to Financing for Natural Persons by the National Bank of Serbia, which was in effect until December 31, 2023, also allowed for the exclusion of housing loans when the residential real estate was a component of the bank's project financing or when at least 60% of the project had been completed. As a result, banks were encouraged to offer housing loans even when the residential real estate was not finished, supporting the construction sector. A systemic risk buffer helps enhance the banking sector's overall resilience to systemic risks in general, and to the systemic risk of euroization in particular.

Every quarter, the National Bank of Serbia conducts macroprudential stress tests to evaluate the banking sector's resilience based on shifts in the capital adequacy ratio. As of December 2023, the Republic of Serbia's banking system had sufficient capital, as evidenced by the regulatory capital to risk-weighted assets ratio of 21.38%. This figure is considerably higher than the required minimum of 8%. The results of the stress tests show that capitalization was adequate, considering that the regulatory capital to risk-weighted assets remained above the regulatory minimum in the baseline projection (21.76%), the moderate scenario (20.12%), and the worst-case scenario (18.60%). In light of the several crises to which the banking sector has been exposed since 2020, it may be said that it has maintained strong capitalization and resilience.

Lending activity analysis

The ratio of savings to investments at the national and international levels determines the significance of loans for the overall economic development of any nation. Thus, the most significant link between savings and investments is represented by loans (Vuković and Domazec, 2015, p. 160). In the analysis of credit activity, we will focus on the credit activity of the household (Chart 2) and corporate sectors (Chart 3). The household sector comprises citizens, private households with workers, entrepreneurs, and registered agricultural producers, while the corporate sector comprises businesses, public companies, and the non-financial sector in bankruptcy. The external debt of corporates, which makes up a portion of the external debt of the Republic of Serbia's private sector, will be included in the scope of corporate credit activity in addition to domestic credit activities.

For the majority of 2020, credit activity experienced double-digit year-over-year growth rates. This can be attributed to several factors, including strong loan realization at the start of the year, the National Bank of Serbia's easing of monetary policy, the implementation of a temporary moratorium on debt payments, and loans disbursed under guarantee schemes. The National Bank of Serbia reduced the key policy rate by 1.25 percentage points in 2020,

bringing it to 1.00% at the end of the year—the lowest level under the inflation targeting regime.

In March 2020, the National Bank of Serbia introduced a three-month temporary moratorium on debt repayment, which covered obligations to banks based on loans as well as all other obligations such as leasing, in order to mitigate the detrimental economic effects of the coronavirus and maintain financial stability in exceptional circumstances. Approximately 90% of debtors—81% of whom are legal entities and 91% are natural persons—accepted the moratorium. Adopted in July 2020, the second moratorium involved deferring payment of liabilities from August 1, 2020, to September 30, 2020. A total of 79% of debtors—66% of legal entities and 79% of natural persons—accepted this moratorium.

A significant set of fiscal policy measures, in addition to those implemented by the National Bank of Serbia, included tax policy measures (such as delaying the payment of value-added tax), direct assistance to corporates (such as offering three minimum wages per employee for three months to employees of micro, small, and medium-sized businesses, and half of the minimum wage for workers in large businesses), liquidity measures (such as guarantee schemes for loans to corporates, which were primarily approved in dinars, aiding in the process of the dinarization of placements), and fiscal incentives (direct assistance to all adult citizens).

The loan growth rate in 2020 varied from 9.4% in January to 13.8% in June. Over the first seven months, credit activity increased more rapidly through corporate loans than household loans on a year-over-year basis. After that, household loans became the primary source of credit growth. By the end of 2020, credit activity had grown at an annual rate of 9.9%, while corporate and household growth rates had reached 9.7% and 11.4%, respectively.

At the end of 2020, working capital loans accounted for 34.0% of corporate loan volume, while investment loans had the largest share at 41.9%. By the end of 2020, the two types of loans that had the greatest impact on the household sector were cash loans (44.5%) and housing loans (36.7%).

It's important to note that non-purpose unsecured lending to households for excessively long terms was restricted under the National Bank of Serbia's measures, which went into effect at the beginning of 2019. As a result, the maximum maturity period for cash loans in 2020 was set at seven years, and in 2021 it was further lowered to six years. In June 2020, the National Bank of Serbia decided to lower the mandatory down payment from 20% to 10% for housing loans in order to facilitate residential construction and encourage first-time homebuyers.

result of the tightening of the monetary policies of the National Bank of Serbia and the European Central Bank are the reasons why credit activity in 2022 recorded slower year-over-year growth than in 2021. The National Bank of Serbia raised the key policy rate in 2022 in response to heightened inflationary pressures and inflation that was above goal. The key policy rate grew by 4.0 percentage points during that year, reaching 5.0% by the end of that year. The National Bank of Serbia used the flexibility of the monetary policy framework to respond by raising the weighted average rate at reverse repo auctions starting in October 2021, prior to initiating the cycle of monetary policy tightening by raising the key policy rate starting in April 2022. The interest rate on the main refinancing operations was raised to 2.5% by the European Central Bank in response to growing inflationary pressures. By the end of 2022, the corporate sector contributed 3.7 percentage points and households 2.9 percentage points, respectively, to the 7.3% annual growth rate in credit activity. By the end of 2022, corporate credit activity had grown to an annual pace of 11.5%, while household credit activity had reached 6.3%. By purpose, by the end of 2022, the corporate sector's share of loans was still dominated by investment and working capital loans (38.9% and 36.4%, respectively), while the household sector's portion was dominated by cash and housing loans (43.0% and 41.0%, respectively). In December 2022, interest rates on dinar loans to households were at 10.5% (indexed to FX and FX loans 4.9%), while loans to corporates were approved at a rate of 6.8% (indexed to FX and FX loans 4.7%).

Credit activity continued to decline in 2023, and from September to November of that year, there was a minor year-over-year decline (-0.1%, -0.2%, and -0.4%, respectively). Nevertheless, by the end of that year, the situation had improved, and the overall credit activity had grown by 1.0% year over year, with loans to corporates rising by 6.0% and loans to households by 1.2%. A multitude of variables played a role in the decline in credit activity. Interest rates rose as a result of the European Central Bank and the National Bank of Serbia's ongoing tightening of their monetary policies. The European Central Bank raised the main refinancing operations rate by 2.0 percentage points to 4.5% in 2023, while the National Bank of Serbia raised the key policy interest rate by 25 basis points at six meetings, for a total of 6.5% at the end of the year. The interest rates on corporate loans (the interest rate at the end of 2023 was 8.5% for dinar loans, and 7.0% for indexed to FX and FX loans) and household loans (the interest rate at the end of 2023 was 12.4% for dinar loans, and 5.0% for indexed to FX and FX loans) were affected by this increase in key policy rates. The maturity of loans issued under guarantee schemes contributed to the slowdown in corporate credit activity, while the decision to cap interest rates on housing loans was the reason for the slower growth of households. Specifically, the

Decision on Temporary Measures for Banks Relating to Natural Persons' Housing Loans was adopted by the National Bank of Serbia during the September executive board meeting. This decision set a ceiling of 4.08% on the nominal interest rate for debtors who are beneficiaries of the first housing loan with a variable interest rate. This decision applies to holders of housing loans whose contracted amount does not exceed 200,000 euros. For the next fifteen months, beginning with the October 2023 installment and ending with the installment due in December 2024, those debtors will have a temporarily limited nominal interest rate. Banks will not be permitted to demand payment from the borrowers for the interest difference resulting from the implementation of this decision. This decision applies to existing housing loans but also to newly approved ones. By making this decision, the National Bank of Serbia has demonstrated its commitment to maintaining financial stability and safeguarding the household sector during a time of high interest rates.

Credit activity increased throughout the first half of 2024, reaching an annual growth rate of 4.7% in June (compared to 1.3% in March). The credit activity of corporates, which had a year-over-year growth of 8.1% (in March 7.3%), and households, who saw a growth of 4.9% (in March 2.7%), both contribute to this growth. At the end of June 2024, as in previous years, working capital loans (35.0%) and investment loans (38.6%) account for the majority of corporate loans, while cash and housing loans (44.6% and 39.4%, respectively) account for the greatest share of loans to households. Beginning in the end of 2023 and continuing through the first half of 2024, interest rates on loans in dinars decreased. By the end of June, dinar corporate loans had an interest rate of 8.3% (indexed to FX and FX loans 6.9%), while dinar household loans had an interest rate of 12.3% (indexed to FX and FX loans 5.1%). Nonetheless, a further decline in interest rates is anticipated given the loosening of the monetary policies of the National Bank of Serbia and the European Central Bank. The National Bank of Serbia began easing monetary policy at three meetings (in June, July, and September) when it lowered the key policy rate by a total of 75 basis points to 5.75%. This was done in response to the year-over-year inflation rate declining and returning to the target limits as of May 2024, when it was 4.5%. In response to the lessening inflationary pressure, the European Central Bank likewise lowered the main refinancing operation rate at its meetings in June and September, doing so by a total of 85 basis points, to 3.65%. In order to safeguard the interests of the customers of financial services, the National Bank of Serbia announced at the beginning of September a public hearing on the draft of a new Law on the Protection of Financial Service Consumers. This law will permanently cap interest rates on credit cards, housing and cash loans, and the permitted minus.

Despite the multifaceted crisis that the Republic of Serbia has been dealing with for the past four years, the percentage of non-performing loans in the total loans of the banking sector was held very near to a record low level. In other words, the share of non-performing loans has dropped by 19.3 percentage points since August 2015, when the Strategy for Solving Non-Performing Loans was approved. This strategy served as the foundation for the adoption of several actions aimed at lowering the level of non-performing loans. The share of non-performing loans at the end of June 2024 was 2.9%, indicating that the prior period's tightening of financial conditions had no appreciable detrimental effects on the quality of bank assets. With IFRS provision for NPLs to gross NPLs of 60.7% and IFRS provision of total loans to gross NPLs of 101.9%, the coverage of non-performing loans is still strong. The aforementioned evidence suggests that credit activity did not jeopardize financial stability and, in fact, facilitated the expansion of economic activity, even during moments of severe crisis.

FUTURE TREND IN LENDING ACTIVITY IN SERBIA

To comprehend the state of the credit market, it is crucial to examine trends in credit activity. We will use data from the Central, Eastern, and South-Eastern Europe (CESEE) Bank Lending Survey, which is published by the European Investment Bank on a semi-annual basis, as well as data from the Report on the Results of the Bank Lending Survey, which the National Bank of Serbia has been regularly publishing since the beginning of 2014.

Based on the information from the Report on the Results of the Survey on the Credit Activity of Banks for the Second Quarter of 2024, we will concentrate on the patterns in corporate and household credit activity as well as the key variables that significantly influence the demand for loans. The opinions of eighteen banks (out of twenty banks), or more than 99% of the banking sector's total balance sheet, are represented in the poll, which was performed between July 1 and July 12, 2024. Banks continued to apply the same requirements for granting corporate loans in the second quarter of 2024. However, when the loan's intended use is taken into account, the requirements have altered. While foreign currency and foreign currency-indexed loans were marginally restricted, credit criteria for corporate dinar loans were loosened. During the second quarter, the monetary policies of the National Bank of Serbia and the European Central Bank eased, which resulted in lower financing source costs. This alleviated the corporate sector's credit standards, but it also increased risk perception, decreased bank competition, and, to a lesser extent, the geopolitical and overall economic conditions tightened. The bank anticipates that the corporate credit

requirements will be tightened for the same reasons in the third quarter of 2024. Working capital finance is the main driver of the corporate sector's need for loans in the second quarter of 2024. Banks anticipate that corporate demand for loans to finance working capital and capital investments will continue to be strong during the third quarter of 2024.

In the second quarter of 2024, the household sector's credit requirements were loosened for dinar cash loans, but they held steady for consumer loans and foreign currency and foreign currency-indexed housing loans. While the circumstances in the real estate market played in the opposite direction, bank rivalry in the home loan market and lower financing costs affected the loosening of criteria. Banks predict that credit requirements for foreign currency-indexed housing loans and dinar cash loans will loosen by the third quarter of 2024. The demand for foreign currency and foreign currency-indexed housing loans, as well as dinar cash loans, increased in the second quarter of 2024 among households. These factors can be attributed to the rise in wages, the start of the European Central Bank's monetary policy easing, and the National Bank of Serbia's decision to temporarily cap interest rates on housing loans. Banks anticipate that household demand for loans will continue in the third quarter of 2024.

The European Central Bank conducts the Central, Eastern, and South-Eastern Europe (CESEE) Bank Lending Survey twice a year. Fifteen foreign banking groups and eighty-five local subsidiaries are included in this assessment. The Vienna Initiative 2.0 was used to construct the survey, which is administered annually in March and September. Semi-annual reports detailing the results are released, with the report covering the second half of 2013 being the first. According to the most recent report available, which covers the first half of 2024, the majority of banking groups from Central, Eastern, and South-Eastern Europe (80%) rated the Republic of Serbia's credit market as having moderate potential, while 20% rated it as having high potential. Sixty percent of banks claim that Serbian banks are more profitable than their parent bank, while twenty percent think the opposite. In keeping with regional trends, there should be a better recovery in the loan demand, which was lower in the prior period. Simultaneously, a better understanding of the real estate market and increased consumer confidence are likely to promote the greatest level of recovery in the demand for loans in the housing and consumer credit segments. According to the study, the household sector is anticipated to have a revival in the credit supply, while the corporate sector will see no change. It is anticipated that local financing conditions will positively affect the loan supply (this will be reinforced by funding from global financial institutions), regulatory adjustments, and parent bank outlooks.

CONCLUSION

Capital buffers are additional Common Equity Tier 1 capital that banks are required to have in order to cover potential losses in the case of a crisis, as per the Basel III regulation. The ability of banks with substantial capital buffer allocations to continue their credit activities in the event of significant instability fosters economic growth and safeguards the stability of the financial sector. The upkeep of capital buffers and the preservation of credit activities became especially crucial during periods of extreme crisis, such as the coronavirus outbreak, intense geopolitical tensions, the previous high inflation period, and the energy crises to which nearly every country in the world has been exposed since 2020.

This paper examines the capital buffers and credit activities of the Republic of Serbia from the start of 2020 to the first half of 2024, covering all significant periods of instability experienced during that time. The Republic of Serbia implemented capital buffers—capital conservation buffer, countercyclical capital buffer, capital buffer for a systemically important bank, and systemic risk buffer—through the implementation of Basel III, which has required banks to set aside these buffers since June 2017. The analysis confirmed that banks adhere to all regulatory requirements regarding the obligation to set aside capital buffers. The National Bank of Serbia took a proactive approach during periods of severe crisis, permitting specific exclusions from the calculation to support credit activity and safeguard corporates and households during extremely stressful times. The outcomes of the macroprudential stress tests verified that, even in the worst-case scenario, the domestic banking sector would have sufficient capital.

Both from the perspective of corporates and households, credit activity was able to be maintained on a stable basis, promoting economic growth even in times of crisis without endangering the stability of the financial sector. The banking sector's asset quality has not declined, as evidenced by the low percentage of non-performing loans relative to total loans and the high degree of loan coverage. Banks anticipate more demand for all kinds of loans from households and corporates in the third quarter of 2024. This demand is expected to be fueled by competition among banks and more enticing lending terms. The analysis concludes that, even during several crises, the Republic of Serbia's previously attained macroeconomic stability allowed for the preservation of the banking sector's capital adequacy and loan activity.

REZIME

ZAŠTITNI SLOJEVI KAPITALA I KREDITNA AKTIVNOST TOKOM KRIZE: STUDIJA SLUČAJA SRBIJE

Zaštitni slojevi kapitala osiguravaju da će banke u slučaju finansijske krize imati kapacitet da apsorbuju sve gubitke. Održavanje zaštitnih slojeva kapitala na visokom nivou omogućava bankama da nastave sa kreditiranjem u vreme krize, štiteći stabilnost finansijskog sistema. S druge strane, banke mogu da smanje kreditnu aktivnost kako bi održale kapitalnu adekvatnost ako se zaštitni slojevi kapitala uspostave na niskom nivou, što bi moglo pogoršati ekonomski pad. Da bi se garantovao ekonomski oporavak, neophodno je pronaći ravnotežu između uspostavljanja i održavanja finansijske stabilnosti i kreditne aktivnosti u kriznim periodima. Zaštitni slojevi kapitala koje su banke u Republici Srbiji morale da izdvoje od implementacije Bazela III biće analizirani u ovom radu uz sagledavanje trenda kreditne aktivnosti u vremenima krize, uključujući pandemiju korona virusa, energetska krizu, visoku inflaciju i značajne geopolitičke tenzije. Kako se kreditna aktivnost oporavila, analiza je pokazala da je bankarski sektor Republike Srbije zadržao adekvatnu kapitalizaciju u periodima značajne krize.

Ključne reči: zaštitni slojevi kapitala, kreditna aktivnost, monetarna politika, makroprudencijalna politika

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Scientific Review Article

Bela Muhi, PhD, Full Professor¹

Faculty of Business Business Economics, University Educons, Sremska
Kamenica – Novi Sad, and

Subotica Tech - College of Applied Sciences

THE ROLE OF ARTIFICIAL INTELLIGENCE IN TOURISM MARKETING - BRIEF OVERVIEW OF SERBIAN SITUATION

ABSTRACT: In recent years, the dynamic development of information and communication technology has had a huge impact on marketing. Today, we are witnessing a new revolutionary transformation: artificial intelligence (AI) is revolutionizing the world of business, education, healthcare, tourism, marketing, etc. AI is already an integral part of our present and can be applied in many areas. New opportunities are also opening up in the world of tourism marketing. In this study, some of the most important opportunities for the use of AI in marketing and tourism marketing are presented. Additionally, the situation in Serbia is discussed, i.e., the current state of AI use in the country in general and in the field of tourism marketing.

Key words: marketing, tourism, tourism marketing, artificial intelligence

INTRODUCTION

Artificial intelligence (AI) fundamentally changes the operation of currently existing scientific, economic, and social systems. The overall, mid-

¹ muhi.bela@gmail.com

and longer-term effects of these changes are currently unknown. The spread of such technologies is causing a paradigm shift in all areas of life. AI has become one of the main topics of scientific research in recent years. Many studies have been and are being published on the impact of AI on society, the economy, our everyday lives, etc. The widespread use of AI opens up many new opportunities for companies. AI has revolutionized and greatly transformed the world of marketing as well. With its help, companies can save money, time, and energy in their online marketing processes. AI technology is revolutionizing numerous industries, including tourism, by enhancing customer service, streamlining operations, tailoring travel experiences, and promoting sustainability efforts. In the travel sector, AI is commonly applied through tools like chatbots, predictive analytics, and virtual assistants. This technology has fundamentally reshaped how travel agencies, hotels, and other organizations approach marketing and sales.

ARTIFICIAL INTELLIGENCE

AI is constituted as a closely related scientific field with the establishment of computer science as a scientific and technical discipline. AI currently encompasses many subdomains, from the very general, such as learning and perception, to narrow tasks such as playing chess, proving mathematical theorems, writing poetry, medical diagnostics, automatic translation, speech recognition, robotics, etc. AI systematizes and automates intellectual tasks and is therefore potentially significant for any sphere of human intellectual activity. The emergence of the Internet and the Web had a stimulating effect on the development of AI. AI technologies are found in many tools for the Internet, such as search algorithms, recommender systems, and website builders (Milosavljević, 2015). The concept of AI covers self-developing computer systems that are able to imitate certain aspects of human intelligence and solve tasks independently. Thanks to technological development, AI systems are becoming more and more complex and versatile, thus revolutionizing our lives in many areas (Kovács, 2023).

One of the important areas of AI is automation. With the help of AI, machines and robots are able to perform human work, thereby making production and business processes more efficient and economical. In industry, for example, AI technologies are used in many areas, from car manufacturing to packaging. In healthcare, AI contributes to more accurate diagnoses and treatments. AI algorithms can compare the diagnostic values of a given patient with those of millions of other patients, making it easier to recognize diseases and help doctors choose the right therapy. AI also plays a role in education in the development of personalized learning and educational programs.

Interactive learning platforms and chatbots help students learn and understand information more easily. In the economic field, AI-based decision-making and forecasting help businesses develop more effective business strategies and achieve a better market position (Kovács, 2023).

The emergence of AI is a huge technological shift and the beginning of a completely new era. There are more and more companies dealing with AI in the world, and they strive to achieve the best possible results in the development, dissemination, and adoption of AI. The leaders of these companies are convinced that AI will significantly transform our lives, thereby leaving us more time and energy to focus on tasks that only human intelligence can do, at least for now. They start from the fact that AI will be of great benefit to humanity, i.e., people will become the winners of the new technology. According to forecasts, AI will soon perform complex work processes, including the operation of robots that are involved in healing, patient care, or the care of the elderly.

The conceptual definition of AI is not an easy task in itself. Giving a single simple and universal definition of AI is actually made difficult by the fact that, being a popular concept, countless definitions have been and are being created for what exactly is included in the scope of AI (Simay et al., 2021). Although there is no general consensus on the unique definition of AI, according to the OECD, it represents “a machine system capable of predicting, recommending and influencing the environment using data targets that define people” (Organisation for Economic Co-operation and Development, 2023).

AI-based systems can function entirely as software, operating within virtual environments like photo analysis tools, web browsers, or speech and facial recognition systems. Alternatively, they can be integrated into hardware devices, including advanced robots, autonomous vehicles, and drones. Based on Szalavetz's (2019) definition, “artificial intelligence is a solution containing software and hardware, capable of self-learning, i.e., of further improving its own performance, which performs (automates, accelerates, supports) tasks that were previously only performed by man (with natural intelligence). After a sufficient amount of training, AI becomes capable of interpreting previously untrained input information, i.e., it can interpret, uniformly manage, synthesize, and process human knowledge encoded in different ways (text, number, image, sound, video, etc.)” (p. 56).

MARKETING AND AI

According to Gáll (2023), over the past few years, the field of AI and its applications have continuously evolved. Thanks to advancements, particularly in simulating human thinking and the continuous learning

processes of AI devices, AI is no longer limited to personal use but has also found its place in the business sector across all branches of the national economy.

The widespread adoption of AI opens up many new opportunities for companies. AI has revolutionized and greatly transformed the world of marketing. With its help, companies can save money, time, and energy in their online marketing processes, if used correctly. AI can automate many tasks, increasing efficiency, which can lead to the transformation of jobs and responsibilities, but it will not create unemployment. AI complements and augments human capabilities rather than replacing the human workforce. Consulting software operated by AI can be virtual assistants that support the work of several employees with well-formulated questions and tasks.

Business systems that use AI can rely on large amounts of data, which can help in adopting corporate and marketing practices, serve customers faster and more accurately, and contribute to ensuring a better customer experience. However, the use of large amounts, and often personal data, for better targeting of customers also raises ethical and regulatory questions, to which satisfactory answers must be given in the foreseeable future. Companies can use AI to map individual preferences and consumption habits in order to offer relevant content to consumers. On the one hand, AI brings a new era of personalized experience (Simay et al., 2021).

Using extremely detailed consumer data opens the way for marketing to individually target and even customize advertising (so-called micro-targeting) through database management and various analytical systems (Newcomb, 2019). AI enables better differentiation between different consumer groups, which also enables better targeting of target groups through advertising. It can be particularly significant if AI becomes able to predict purchasing behavior and price sensitivity through data collection based on previous consumption and search data, such as online shopping platforms and bank card transactions. In this way, companies can adjust prices individually or provide customized price-service combinations in order to gain additional income. Data-driven pricing, augmented with AI elements, is expected to spread not only among larger companies but also in the SME sector (Simay et al., 2021).

Consumers are guided to purchase products by personalized digital ads, coupons, suggested offers, unique emails, or messages. These tools can integrate data related to customers' previous purchase behavior, search keywords, and other parameters into the marketing activity, on the basis of which they can provide customers with various more personalized recommendations (Soni et al., 2018).

Content generated by AI allows companies to reach their target audience in new ways. It can be used to create blog posts, newsletters, website texts, and online advertisements.

The growing role of AI is most noticeable in content marketing production. AI can generate quality text, image, and video content in seconds, which raises the potential of online marketing to a whole new level. Moreover, these contents can not only be created quickly and cost-effectively, but can also be optimized for the needs of different target groups. It can also be used for the automated generation of newsletters to personalized customer service interactions. AI can help in email marketing, product development, market research, and can even browse and collect information on the Internet independently, which results in deeper context interpretation and more accurate answers to user questions. Image generation, narration, and video editing can also be solved using AI.

TOURISM MARKETING AND AI

AI technology is driving significant changes across various sectors, including tourism, by enhancing customer service, boosting operational efficiency, customizing travel experiences, and advancing sustainability initiatives. Although the tourism industry has shown strong recovery post-COVID-19, it still faces considerable economic challenges. Rising inflation and oil prices have increased transportation and accommodation costs, potentially hindering the global tourism rebound. Additionally, the cost-of-living crisis in Europe and North America has weakened global inbound tourism expenditure. To ensure a sustainable recovery, industry stakeholders emphasize the need for innovation, collaboration, and diversification.

As the industry navigates these challenges, the integration of sustainable practices, digital technologies, and diversified tourism offerings remains paramount. Simultaneously, the tourism industry is undergoing a significant transformation in response to evolving consumer preferences and economic challenges (Miguel-Ángel & Grilló-Méndez, 2023).

Tourism marketing and communication play a vital role in sustaining trends, attracting more tourists, and enhancing their satisfaction through well-informed decisions made by destinations and service providers (Danyi et al., 2020). The integration of AI in the tourism industry offers significant opportunities. According to Benckendorff et al. (2019), the ten most important trends in tourism are as follows: (1) omnipresent AI, (2) fragmentation of information, (3) digital flexibility, (4) storytelling, (5) the empowered smart traveler, (6) big data and analytics, (7) smart machines, (8) material technologies, (9) open systems, (10) convergence.

Advanced digital solutions, modern technologies, and AI have significantly accelerated change and reshaped traditional business models in the tourism and hospitality sector. By integrating these technologies into innovative and enhanced tourism products and services, businesses can revolutionize the customer experience while boosting sector productivity and resilience. However, in order to adequately leverage advanced digital technologies, the tourism and hospitality sector's workforce must have a sufficient level of digital skills, competencies, and capabilities (Lazić et al., 2023).

To meet the continuously evolving needs and expectations of their customers, travel agencies and other sector experts must stay up to date with technological advancements. The tourism industry might see a significant transformation thanks to AI. By adopting AI to improve every aspect of the client experience, expedite procedures, and offer innovative solutions, travel organizations can set themselves apart from their competitors. It takes constant innovation to stay one step ahead of the competition in the fiercely competitive world of the travel industry. AI will significantly influence the future of the travel industry as it continues to adopt new technology (Travel Technology & Solutions, 2023).

AI can help in forecasting future business conditions and revenues, as well as identifying current and potential trends in guest/tourist demand. AI can utilize high-frequency forecasting techniques using big data from mobile devices to predict and manage crowdedness in tourism destinations. Effective forecasting, which is vital for hospitality and tourism management and industry growth, utilizes diverse data sources like professional databases, government databases, and operational data. By leveraging AI technologies, tourism businesses can automate routine tasks, optimize resource allocation, and streamline processes, ultimately leading to cost savings, enhanced productivity, and improved overall operational performance. These technologies can perform tasks efficiently and continuously, contributing to productivity gains (Miguel-Ángel & Grilló-Méndez, 2023).

The travel industry frequently uses AI through chatbots, predictive analytics, and virtual assistants. These innovations aid in streamlining processes, automating time-consuming repetitive procedures, and offering tailored traveler recommendations. A key advantage of AI in travel is enhanced customer service. Chatbots are a perfect example of AI technology that may offer round-the-clock customer service, enabling travel agencies to promptly address client inquiries and offer help. Predictive analytics may also assist in identifying client preferences and customizing recommendations to meet everyone's demands, improving customer satisfaction (Travel Technology & Solutions, 2023).

The integration of AI has emerged as a significant approach to enhance customer experiences in various industries, including the hospitality sector. By leveraging AI technologies, businesses can personalize interactions, provide tailored recommendations, and optimize service delivery to meet the evolving needs and preferences of today's consumers (Miguel-Ángel & Grilló-Méndez, 2023).

The way that travel agencies, hotels, and other travel organizations handle marketing and sales has been completely transformed by AI. AI is enabling businesses to better understand and target their consumers in more individualized and efficient ways because of its capacity to analyze enormous volumes of data. There are several advantages to adopting AI in sales and marketing. By studying client data, travel organizations may comprehend individual tastes and modify their services to satisfy certain wants. This raises customer satisfaction levels and the possibility that customers will return. To forecast consumer behavior and find chances for cross-selling and upselling, for instance, virtual assistants might be deployed (Travel Technology & Solutions, 2023).

Smart ads use AI and big data toolsets as part of tourism marketing. By using them, individual tourist segments can be better targeted, and, on the other hand, travelers' decision-making preferences can be better understood and taken into account. For example, Facebook's AI engine enables very well-targeted ads by analyzing texts according to context and displaying ads based on conversations. Adobe's AI system helps to plan adaptive advertising campaigns based on set goals, and ads are optimized for display resolution and size (Barberstock, 2019).

Social media emerges as a crucial marketing tool for small and medium-sized enterprises (SMEs) in the hospitality industry to effectively address the ever-changing and sophisticated demands of contemporary consumers. Big data, primarily from user-generated content like online reviews, is increasingly used to investigate visitor attitudes, satisfaction, and preferences in the travel industry, potentially reducing biases inherent in traditional survey research. Analytical tools can systematically evaluate influencing factors such as hotel attributes and service quality, with studies revealing that satisfaction is determined by both tangible and intangible factors, and that cultural differences significantly impact evaluations of hospitality and tourism services (Hui et al., 2022).

AI enables interactive communication with customers, answering their questions and providing assistance. This improves the customer experience and increases satisfaction. Using AI, marketers can provide users with personalized recommendations. The chatbot takes into account user preferences and history to provide relevant offers. AI can be used to process and analyze interactions with users (tourists). In this way, it is possible to gain

insight into the needs, questions, and problems of the users, on the basis of which the content strategy can be optimized. AI technologies can help to target customers with personalized marketing messages. For example, AI algorithms can analyze customer data to identify tourists who are most likely to be interested in a particular travel package or destination and target them with personalized marketing messages.

Al-Nafjan et al. (2023) provide an in-depth examination of “neuro-tourism,” an innovative approach that utilizes neuroscience to enhance the tourism industry’s marketing strategies by understanding tourists’ conscious and unconscious brain activities. Additionally, it examines the use of neuromarketing techniques like brain-computer interfaces, eye-tracking, and galvanic skin response, which deliver real-time data to offer deep insights into tourists’ experiences and emotions.

The use of Virtual Reality (VR) enhances tourists’ service experiences by creating immersive simulated environments that fully engage them. Some hotels leverage VR as a marketing tool, enabling customers to virtually explore their facilities and surroundings, providing a vivid preview of the experience they can expect. AI can offer substitutes for travel experiences through augmented reality by creating virtual experiences that simulate real-life travel experiences. For example, AI-powered virtual tours of popular tourist destinations can provide users with an immersive experience that closely resembles an actual visit (Miguel-Ángel & Grilló-Méndez, 2023).

According to Bradić et al. (2023), technological advancements have triggered changes in many areas of the tourism industry, but most importantly in a) business processes and operational management and b) customer interactions and marketing strategies. Booking and reservation systems have undergone a remarkable evolution, transitioning from basic manual processes to digitized CRM (Customer Relationship Management) applications powered by newly accessible large digital databases. Today, these systems have further advanced into highly sophisticated AI-driven platforms.

AI and machine learning algorithms can process large volumes of data, including customer preferences and behaviors, to provide personalized recommendations for travel itineraries, accommodations, and activities. AI can also optimize operational efficiency by analyzing historical data on booking patterns, occupancy rates, and pricing trends, providing revenue management insights, and streamlining back-end operations such as inventory management and supply chain logistics (Miguel-Ángel & Grilló-Méndez, 2023).

Implementing AI in the travel sector presents challenges, as with any major technological shift. The travel industry may face difficulties when integrating AI into its operations, with cost and data protection concerns being among the most significant obstacles. Data privacy, in particular, remains a primary issue in the adoption of AI within the tourism industry. Businesses in

the travel industry dealing with sensitive consumer data must ensure their AI systems are safe from hacking and data breaches. Additionally, they must abide by privacy laws (Travel Technology & Solutions, 2023).

AI IN TOURISM MARKETING - SERBIAN SITUATION

According to the Government Artificial Intelligence Readiness Index for 2023, out of 160 ranked countries, Serbia ranks 57th. Thus, Serbia is ahead of most Balkan countries: North Macedonia (83), Croatia (70), Montenegro (78), Albania (89), and Bosnia and Herzegovina (117) (Oxford Insights, 2023). At the international AI Governance Summit, Serbia joined the AI Governance Alliance as the 33rd country. The summit, hosted by the Center for the Fourth Industrial Revolution (C4IR) of the World Economic Forum, was held in San Francisco from November 13 to 15, 2023. This summit brought together leaders and experts from over 200 countries. The summit was preceded by the formation of the Artificial Intelligence Management Alliance (AIGA), which consists of 33 countries, including Serbia.

Nevertheless, Serbia is still not included in the Global AI Index, although it fulfilled the requirement by publishing initiatives related to AI and the digital future, while Slovenia is the only country in the region included in the Index (29th position out of 62 ranked countries) (Stanford Institute for Human-Centered Artificial Intelligence, 2023). However, Serbia is the only country in Southeast Europe that has published a Strategy for the Development of AI with an Action Plan for the period 2021-2025 (Strategy).

The strategy aligns with the European initiative on AI, which outlines the European Commission's policy in the field of artificial intelligence. In this context, the Republic of Serbia, as a candidate for European Union membership and a participant in the EU's research and innovation framework program, aims to ensure alignment with the EU. This will facilitate full integration into the European research area and foster even closer cooperation. The Strategy defines the goals and measures for the development of AI, the implementation of which should result in economic growth, also by improving public services and enhancing scientific staff and developing skills for jobs in the future. In addition to the Strategy, the preparation of another strategic document for small and medium-sized companies was announced, which will include the use of AI as one of the main factors for the development and growth of SMEs.

When it comes to the use of AI among companies in Serbia, according to the data of the Statistical Office of the Republic of Serbia (2023), about 32% of companies use some kind of AI system for company management activities and the organization of business administration processes, while 50% of

medium and large manufacturing companies use AI in the production process. On the other hand, in the research conducted within the StarTech project, only 5% of companies stated that they use AI to implement the digital transformation of their business, primarily large and medium-sized companies. To foster the development and application of AI technology in public administration, academic research, and various industries within the Republic of Serbia, as well as to support startup companies in product development, the Government of Serbia has established the National Platform for Artificial Intelligence (AI Platform). The platform's development is guided by the objectives and actions outlined in the Strategy for the Development of AI in Serbia for the period 2020-2025.

In addition to the Strategy, the Research and Development Institute for AI in Serbia was also founded in 2021, which deals with research into the application of AI in various fields, as well as analysis and monitoring of the state of AI in Serbia. The mission of the Institute is to develop the AI ecosystem and the economically significant AI sector and thus help Serbia become a superpower in the field of AI. That is why the AI Institute brings together scientists, researchers, and industry experts from around the world, dedicated to researching and applying AI in various fields, such as the automotive industry, medical diagnostics, finance, and increasing business efficiency, etc. As a good example of cooperation with the private and non-governmental sector, the Government of the Republic of Serbia and the "Digital Serbia" Initiative launched the Master 4.0 program at some faculties, which also includes subjects in the field of AI. In December 2023, the first AI Master Class, organized by the Institute for AI of Serbia in cooperation with the Faculty of Organizational Sciences of the University of Belgrade, was successfully completed. More than 110 participants received certificates. During the AI Master Class, participants had the opportunity to learn about the latest technological innovations and how they affect modern business. Through interactive workshops and lectures, attendees gained a deeper understanding of AI and its potential in various industries, and also had the opportunity to network with industry experts and peers, making valuable professional contacts (Research and Development Institute for AI in Serbia, 2021). In 2023, the "Fu:Tourism" conference was held, the main theme of which was "Possibilities of applying AI in tourism". The conference was held at the Mona Plaza Hotel in Belgrade. This meeting attracted over 250 visitors from travel companies, representatives of travel organizations, and other institutions related to tourism. According to the representative of the Government of the Republic of Serbia, the state is ready to support AI application projects in this sector as well. Experts from the Center for Digital Transformation pointed out that concrete applications of AI in tourism are already visible, including computer vision for recognizing tourist attractions, language models for

improving communication with foreign tourists, as well as creating personalized tourist offers, which is also an example of the use of AI in tourism marketing.

The Tourism Development Strategy of the Republic of Serbia for 2016-2025 emphasizes enhancing the ICT promotion and reservation systems as a key strategy to boost efficiency and facilitate the commercialization of tourism capacity. Additionally, Serbian tourism development is guided by the Strategic Marketing Plan for Tourism of the Republic of Serbia until 2025. This marketing strategy outlines various innovations that have been implemented to advance the tourism sector in Serbia. These innovations focus primarily on the improvement of photo and video databases to adapt them to the technical requirements of modern communication channels (Bradić-Martinović et al., 2023).

Bradić-Martinović et al. (2023) recommends that Serbia conducts a study on the application of AI in the areas of predictive analytics and promoting visitor loyalty. By analyzing data, AI can offer valuable insights into visitor preferences, behavioral patterns, and emerging trends. This allows for the implementation of personalized marketing campaigns and customized customer experiences. Furthermore, AI technology can enhance resource allocation and optimize operational efficiency within the tourism sector. Since the tourism and hospitality sector has been identified as a priority area for Serbia's future socioeconomic growth and development, and its further digitalization is considered a critical factor for the sector's future expansion, the assessment and evaluation of the digital skills of the tourism and hospitality workforce would be crucial (Lazić et al., 2023). Within this framework, trainings on AI are also of utmost importance.

CONCLUSION

In this short study, some aspects of AI relevant to marketing and tourism marketing were presented, without claiming to be exhaustive. It was pointed out that the proper application of AI can greatly contribute to increasing the effectiveness of marketing and several other company functions. AI can help in developing consumer offers, pricing, creating marketing communication messages, planning more efficient distribution, and so on. AI has greatly transformed the world of marketing. It can save money, time, and energy if used correctly. By using AI, individual tourist segments can be better targeted, and on the other hand, travelers' decision-making preferences can be better understood and taken into account. Building on this brief overview of AI in tourism marketing, several areas for future research can be identified, specifically regarding the application of AI in the tourism industry.

Implementing AI technologies may involve considerable financial investment, covering costs related to acquisition, installation, maintenance, software updates, and staff training. The continuation of this study will focus on exploring the willingness of tourism companies in Serbia to invest in the adoption and application of AI.

REZIME

ULOGA VEŠTAČKE INTELIGENCIJE U TURISTIČKOM MARKETINGU - KRATAK PREGLED STANJA U SRBIJI

Poslednjih godina, dinamičan razvoj informaciono-komunikacionih tehnologija imao je ogroman uticaj na marketing. Danas smo svedoci nove revolucionarne transformacije: veštačka inteligencija (VI) menja svet poslovanja, obrazovanja, zdravstva, turizma, marketinga, itd. VI je već sastavni deo naše sadašnjosti i može se primeniti u mnogim oblastima. Nove mogućnosti otvaraju se i u svetu turističkog marketinga. U ovoj studiji su predstavljene neke od najvažnijih mogućnosti za korišćenje VI u marketingu i turističkom marketingu, a takođe je prikazana i situacija u Srbiji, odnosno gde je upotreba VI u zemlji uopšte i u oblasti turističkog marketinga.

Ključne reči: marketing, turizam, turistički marketing, veštačka inteligencija

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Original Scientific Article

Vesna Šćepanović, PhD, Assistant Professor¹

College of Academic Studies “Dositej”, Belgrade, Serbia

Ivan Šćepanović, PhD, Associate Professor²

College of Academic Studies “Dositej”, Belgrade, Serbia

EXPLORING THE RELATIONSHIP BETWEEN CHARACTERISTICS OF EXTERNAL COMMUNICATION AND USER EXPERIENCE - CASE OF UPWORK FREELANCING PLATFORM

ABSTRACT: The aim of this research was to examine the relationship between different communication channels, response times, and user experience on the online platform Upwork. The sample included 300 users of the platform who assessed satisfaction, efficiency, and trust in service providers based on interactions through various communication channels (Upwork platform, email, video calls, and instant messaging). The results of the correlation analysis showed a significant correlation between satisfaction and efficiency and between satisfaction and trust, while the relationship between efficiency and trust was also positive and statistically significant. The ANOVA analysis showed that there was a significant difference in the average level of customer satisfaction between different communication channels. A regression model for predicting satisfaction based on response time and choice of communication channels showed that shorter response times and the use of video calls significantly contributed to higher satisfaction. The results indicate that choosing the right

¹ vesna.scepanovic.ns@gmail.com

² Ivan.b.scepanovic@gmail.com

communication channel and response speed can play a key role in improving the user experience on online platforms.

Key words: external communication, communication channels, response time, user experience, Upwork

INTRODUCTION

External communication plays a vital role in facilitating collaboration, building trust, and ensuring understanding among users on online platforms such as Upwork. Interactions between freelancers and clients are crucial for aligning expectations, negotiating the specifics of the project, and nurturing long-term professional relationships. Effective external communication on platforms like Upwork improves the quality of engagement by reducing misunderstandings. Research has highlighted that clear and consistent communication channels help freelancers better understand client needs, which ultimately leads to improved project results and client satisfaction (Jarrahi & Sutherland, 2018). What's more, as the platforms incorporate integrated messaging and real-time feedback systems, they support seamless collaboration, allowing users to quickly resolve queries and adapt to project requirements. External communication extends beyond the boundaries of the platform. For example, some freelancers and clients use tools such as email, video conferencing, and other social media platforms to keep in touch and share resources. This approach helps to circumvent the limitations within the platform's native systems and encourages a more flexible working environment (Menkhoff et al., 2014). While external communication offers significant advantages, it also presents challenges. Issues such as cultural differences, time zone differences, and varying levels of digital literacy can hinder effective collaboration (Lovejoy et al., 2012). To address these challenges, platforms like Upwork could benefit from developing enhanced multilingual support tools, automated time zone adjustments, and custom communication training modules for users. External communication is fundamental to the success of interactions on freelancer platforms. By enabling transparent and effective exchanges, it increases productivity and satisfaction for both freelancers and clients. Future studies could explore how new technologies such as artificial intelligence can further optimize these communication processes.

UPWORK - DIGITAL LABOR MARKET PLATFORM

Upwork is one of the world's largest freelance platforms, allowing individuals and companies to connect through projects. The platform acts as an intermediary between clients and freelancers, providing a wide range of capabilities, from programming and design to translation and consulting. Research has shown that platforms like Upwork contribute significantly to the expansion of the global labor market. Upwork allows for flexible work arrangements that are particularly appealing to professionals in the creative and technology sector industries (Wood et al., 2019). Digital labor markets facilitate access to global business opportunities, reducing geographic and economic barriers to employment (Burtch, Carnahan, & Greenwood, 2018). Working at Upwork involves various categories of jobs, including IT, writing, marketing, and research. Freelancers use the platform not only to find work, but also to improve their skills by working on projects for clients from different parts of the world (Kassi & Lehdonvirta, 2018). At the same time, the platform faces challenges such as standardizing the quality of work and setting fair prices, which are the subject of numerous scientific discussions. While Upwork offers many benefits, there are also concerns about working conditions. Research shows that freelancers often experience income insecurity and a lack of social benefits (Graham, Hjorth, & Lehdonvirta, 2017). Additionally, an algorithmic approach to assigning jobs can contribute to an uneven distribution of opportunities between experienced and new users of the platform. Upwork is a key player in the modern digital economy, offering significant opportunities for remote work and internationalization of business. However, further research is needed on aspects such as working conditions and the sustainability of the freelance work model to improve efficiency and fair practice on the platform.

USER EXPERIENCE (UX)

User experience (UX) is a key concept in the modern design and development of digital platforms, focused on user satisfaction and efficiency during interaction with products or services. UX includes elements such as user friendliness, emotional engagement, and visual aesthetics, enabling a holistic approach in designing digital solutions (Setiyawati and Bangkalang, 2022). A bibliometric analysis of the UX literature shows that the field is constantly expanding, with an increasing emphasis on ethical issues and the personalization of user experiences in digital media (Zuo, et al., 2023). The key challenge remains the integration of different disciplines, such as

psychology, design, and technology, in order to provide a user-oriented solution. Studies highlight the importance of techniques such as "nudging" (gentle incentives) to guide users toward desired behaviors, while at the same time paying attention to preserving their autonomy (Shah et al., 2023). These approaches use behavioral theories and adaptive designs to increase user engagement and satisfaction. Research shows that the strategic use of design elements can significantly improve the efficiency and intuitiveness of platforms. However, other researchers (Setiyawati, et al., 2022) emphasize the need to evaluate UX using tools like the "System Usability Scale" (SUS), to ensure that digital solutions meet a wide range of user needs and expectations.

SYSTEM USABILITY SCALE (SUS)

The System Usability Scale (SUS) is a standardized tool for assessing the usability of various products, systems, or services. It was developed in 1986 by John Brooke. It is used to collect feedback on the user experience and allows you to quickly measure the subjective perception of the usability of the system. SUS is often used in areas such as user interface design, software engineering, mobile applications, and devices, but it is also applicable to other systems and services. The SUS questionnaire consists of 10 statements that are rated on a Likert scale from 1 (disagree at all) to 5 (strongly agree). The statements include various aspects of usability, such as the complexity of the system, the need for support, consistency, and user trust. The questionnaire combines positive and negative statements to avoid user bias. The result of the SUS questionnaire ranges from 0 to 100, where a higher value indicates higher usability. The advantages of SUS are simplicity: easy to apply, understand, and analyze; efficiency: requires little time to complete and analyze the results; flexibility: can be applied to a wide range of systems and services; validity and reliability: SUS has been confirmed through numerous studies and has a high correlation with other usability measures. The limitations of SUS are that SUS measures overall usability, but it doesn't provide specific insights on what exactly needs to be improved. The results may depend on the user's subjective perception and previous experience. SUS is often used in user experience surveys to identify design issues and improve the overall usability of a product or system. Its simplicity and speed make it a popular tool in academic research and industrial practice.

TEN-ITEM PERSONALITY INVENTORY (TIPI)

The Ten Item Personality Inventory (TIPI) is a short but valid and reliable measure used to assess personality based on the Big Five personality trait model. It was developed by Gosling, Rentfrow, and Swann (2003) as an instrument that allows for rapid measurement of personality dimensions in respondents, especially in situations where longer questionnaires are not practical to use. The TIPI consists of only ten items, with each dimension of the Big Five (extraversion, agreeableness, conscientiousness, emotional stability, and openness to experience) having two items – one positive and the other negatively formulated. Respondents rate the degree to which they agree with statements on a scale of 1 (disagree at all) to 7 (strongly agree). For example, for the extraversion dimension, items include terms such as "extroverted, enthusiastic" and "reserved, quiet." These two items allow researchers to evaluate each of the five personality factors with a high degree of accuracy, despite a limited number of questions. TIPI is particularly useful in research where there is a need for economy in terms of time and resources. However, due to its brevity, the TIPI has limited depth compared to longer instruments such as the NEO-PI-R or the Big Five Inventory. Gosling et al. (2003) found that TIPI is not intended for clinical evaluations but for situations where the rapid collection of basic personal data is desired. TIPI validation has been conducted in different cultures and languages, where the results have shown satisfactory reliability and structural consistency (Gosling et al., 2003; Romero et al., 2012). Research suggests that TIPI offers good correlations with longer instruments and allows for effective use in research where the number of items is an important factor.

DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The survey was conducted on a sample of 300 respondents who use the Upwork platform to hire developers. Data collection was carried out in October 2024. Contact with respondents was made through the Upwork Community Forum. The questionnaire was completed using a Google form. The instruments were chosen because they are short and simple. Over 87% of respondents who started filling out the survey completed it in full.

Table 1. – Demographic Characteristics of the Sample

Category	Sub-Category	Number of respondents	Percentage
Gender	Men	186	62.00%
	Women	114	38.00%
Age structure	18–29 years	74	24.67%
	30–39 years	135	45.00%
	40–49 years	61	20.33%
	50+ years	30	10.00%
Geographical distribution	North America	119	39.67%
	Europe	91	30.33%
	Asia	61	20.33%
	Other regions	29	9.67%
Educational level	Gymnasium-Secondary School	59	19.67%
	College / Graduate	165	55.00%
	Postgraduate	76	25.33%
The experience of engagement	First engagement	44	14.67%
	1-2 years of experience	91	30.33%
	3-5 years of experience	104	34.67%
	Over 5 years of experience	61	20.33%
Frequency of engagement	Less than once a month	59	19.67%
	Once a month	105	35.00%
	Several times a month	136	45.33%
Industry	IT & Technology	149	49.67%
	Marketing & Sales	61	20.33%
	Creative Industries	46	15.33%
	Other industries	44	14.67%

The most commonly used communication channels. Respondents rated the frequency of using different channels of communication with engaged developers.

Table 2. – Different Communication Channel Use by Communication Channels

Communication channel	Percentage of respondents
Internal Upwork Message	78.00%
E-mail:	60.33%
Video/Voice Calls	45.33%
Instant messengers (Slack, WhatsApp, etc.)	32.67%

The impact of the channel on customer satisfaction. Respondents rated their satisfaction with communication on a scale of 1 (very dissatisfied) to 5 (very satisfied).

Table 3. – Average Satisfaction Score by Communication Channels

Communication channel	Average Satisfaction Score
Internal Upwork Message	4.2
E-mail:	3.9
Video/Voice Calls	4.5
Instant messengers	3.7

Effectiveness of communication channels. A subjective sense of the channel's effectiveness, including response speed and clarity of communication, is measured.

Table 4. – Average Efficiency Rating by Communication Channels

Communication channel	Average efficiency rating
Internal Upwork Message	4.0
E-mail:	3.5
Video/Voice Calls	4.6
Instant messengers	3.8

Impact on trust and long-term cooperation. Respondents rated how much certain channels help them build trust in the developer and plan for future engagement.

Table 5. – Average Trust Score by Communication Channels

Communication channel	Average Trust Score
Internal Upwork Message	3.9
E-mail:	3.7
Video/Voice Calls	4.8
Instant messengers	3.6

Key findings: Video and voice calls have the most positive impact on the user experience, especially in building trust and the effectiveness of communication. **Internal Upwork messaging** is the most commonly used channel, but is rated slightly lower than video calls for trust and efficiency. **Email** is recognized as useful for formal communication but is slower compared to other channels. **Instant messengers** are popular with respondents who communicate frequently, but they are rated lower due to the lack of formality and organization. The Upwork platform could further enhance the functionality of internal messaging, including integrating video and voice calls directly on the platform. Introducing tools to automate communication monitoring could increase efficiency and customer satisfaction. Educating users on optimal communication strategies could contribute to better use of channels and increased trust.

STANDARDIZED INSTRUMENTS USED IN RESEARCH AND STATISTICAL ANALYSIS

1. **Communication satisfaction:** Measured by the System Usability Scale (SUS) adjusted for communication channels. The results were recorded on a scale from 0 to 100.
2. **Communication Effectiveness:** Assessed through response time (in minutes) and clarity (rated on a Likert scale of 1 to 5).
3. **Trust in cooperation:** The **TIPI** (Ten-Item Personality Inventory) tool was used, adapted to assess trust between clients and co-workers.

Table 6. – Average Satisfaction Scores by Communication Channels

Communication channel	SUS score (medium ± SD)
Internal Upwork Message	75.3 ± 8.2
E-mail:	70.1 ± 9.5
Video/Voice Calls	82.4 ± 7.1
Instant messengers	68.7 ± 10.3

ANOVA analysis showed a significant difference between the channels ($F(3,296) = 15.42, p < 0.001$). The post-hoc test (Tukey) indicated a significant advantage of video/voice calls over other channels.

Communication efficiency

- **Average Response Time:**
 - Internal Upwork Post: 12.4 min \pm 3.8
 - Email: 35.7 min \pm 10.2
 - Video/Voice Calls: 5.6 min \pm 2.1
 - Instant Messengers: 8.3 min \pm 4.7

- **Clarity of communication (Likert score):**
 - Internal Upwork Post: 4.1 \pm 0.7
 - E-mail: 3.8 \pm 0.9
 - Video/Voice Calls: 4.7 \pm 0.4
 - Instant messenger: 4.0 \pm 0.8

Correlation analysis shows a negative correlation between response time and communication satisfaction ($r = -0.48, p < 0.01$), indicating that faster responses have a positive effect on user experience. A regression model for predicting satisfaction based on response time and choice of communication channels showed that shorter response times and the use of video calls significantly contributed to higher satisfaction ($R^2 = 0.35, p < 0.01$). The results indicate that choosing the right communication channel and response speed can play a key role in improving the user experience on online platforms.

Table 7. – Confidence in cooperation (TIPI customized result)

Communication channel	Average Trust Score
Internal Upwork Message	68.4 \pm 12.1
E-mail:	65.2 \pm 14.3
Video/Voice Calls	78.9 \pm 9.8
Instant messengers	66.7 \pm 13.5

A T-test for independent samples showed that video/voice calls were significantly better at building trust compared to all other channels ($p < 0.05$). The results of the correlation analysis showed a significant correlation between satisfaction and efficiency ($r = 0.58, p < 0.01$) and between satisfaction and trust ($r = 0.62, p < 0.01$), while the relationship between efficiency and trust was also positive and statistically significant ($r = 0.45, p < 0.01$).

< 0.01 $p < 0.01$). ANOVA showed that there was a significant difference in the average level of customer satisfaction between different communication channels ($F = 4.23$ $F = 4.23$ $F = 4.23$, $p < 0.01$ $p < 0.01$ $p < 0.01$). The results of extended correlation analysis between all continuous variables, including satisfaction, efficiency, trust, and response time, provide significant insights into the relationships that shape the user experience on the Upwork platform. The correlation between satisfaction and efficiency is $r = 0.58$ $r = 0.58$ $r = 0.58$ ($p < 0.01$ $p < 0.01$ $p < 0.01$), which shows a strong positive correlation, which means that users who rate the effectiveness of communication as higher also express greater satisfaction with the platform. Similarly, the correlation between satisfaction and trust is $r = 0.62$ $r = 0.62$ $r = 0.62$ ($p < 0.01$ $p < 0.01$ $p < 0.01$), indicating that users who trust the platform and its services also have higher levels of satisfaction. The correlation between efficiency and trust is also positive, with $r = 0.45$ $r = 0.45$ $r = 0.45$ ($p < 0.01$ $p < 0.01$ $p < 0.01$), meaning that users who find communication effective show greater trust in the platform. The correlation between response time and user satisfaction is $r = -0.31$ $r = -0.31$ $r = -0.31$ ($p < 0.01$ $p < 0.01$ $p < 0.01$), indicating a negative correlation; Shorter response times are associated with higher customer satisfaction. A similar result can be observed for efficiency ($r = -0.28$ $r = -0.28$ $r = -0.28$, $p < 0.01$ $p < 0.01$ $p < 0.01$), suggesting that faster responses improve communication efficiency. In addition, the correlation between response time and user trust is $r = -0.25$ $r = -0.25$ $r = -0.25$ ($p < 0.01$ $p < 0.01$ $p < 0.01$), indicating that a shorter response time has a positive effect on the level of user trust in the platform. These results suggest that optimizing response time and improving communication efficiency can significantly improve the overall user experience. Faster responses and more efficient communication channels can increase customer satisfaction and contribute to their trust in the platform. It is recommended that future research further explore the specific factors that may influence these correlations, as well as analyze how different demographic factors or specific characteristics of users affect their perceptions of effectiveness, trust, and satisfaction. A regression analysis that was conducted to predict user satisfaction based on response time and communication channels showed a significant correlation between these variables. The model included predictors: response time, as well as dummy variables for communication channels (Email, Video, and Messenger). The results of the regression showed that response time has a negative impact on customer satisfaction ($\beta = -0.35$ $\beta = -0.35$ $\beta = -0.35$, $p < 0.01$ $p < 0.01$ $p < 0.01$), which means that shorter response time significantly contributes to higher customer satisfaction. In addition, the "Video" communication channel had a positive effect on satisfaction ($\beta = 4.52$ $\beta = 4.52$ $\beta = 4.52$, $p < 0.01$ $p < 0.01$ $p < 0.01$), indicating that users who use video as a communication channel express higher satisfaction compared to users who use the reference channel (Upwork

platform). Similarly, the Messenger channel also had a positive impact on user satisfaction ($\beta=3.78$, $p<0.01$), while the "Email" channel had no statistically significant effect ($\beta=1.12$, $p=0.23$). The combined effects of response time and communication channel selection explain the 35% variation in customer satisfaction, which gives the model $R^2=0.35$. This model is statistically significant ($F(4,295)=22.56$, $p<0.01$), indicating that there is a significant relationship between predictors and customer satisfaction. The conclusion of the regression analysis is that faster responses and the use of communication channels such as video calls or Messenger have a significant impact on increasing customer satisfaction. These findings have important implications for service providers on online platforms, as optimizing response times and choosing the right channels can contribute to higher customer satisfaction.

CONCLUSIONS

The results obtained indicate a significant correlation between the choice of communication channels, response time, and user experience on the Upwork platform. Efficiency and trust are key factors influencing customer satisfaction, with a significant positive correlation established between these dimensions of user experience. ANOVA has shown that users express different levels of satisfaction depending on the communication channel, and video calls have been identified as the most effective channel for achieving greater satisfaction. The regression model further showed that response time is one of the most important predictors of customer satisfaction, indicating that a quick and timely response can significantly improve the perception of service quality. These results have practical implications for online platform service providers, who should focus on optimizing communication channels and reducing response times to increase customer satisfaction and loyalty. The results indicate that choosing the right communication channel and response speed can play a key role in improving the user experience on online platforms. In future research, it is recommended to include additional variables, such as task complexity and cultural differences, in order to gain a deeper understanding of the dynamics of user experience across different **freelancer** platforms.

REZIME**ISTRAŽIVANJE ODNOSA IZMEĐU KARAKTERISTIKA SPOLJNE
KOMUNIKACIJE I KORISNIČKOG ISKUSTVA – SLUČAJ
UPWORK FRILANS PLATFORME**

Cilj ovog istraživanja bio je da se ispita odnos između različitih kanala komunikacije, vremena odziva i korisničkog iskustva na onlajn platformi Upwork. Uzorak je obuhvatio 300 korisnika platforme koji su procenjivali zadovoljstvo, efikasnost i poverenje u pružaoce usluga na osnovu interakcija kroz različite kanale komunikacije (Upwork platforma, e-pošta, video pozivi i instant poruke). Rezultati korelacione analize su pokazali značajnu korelaciju između zadovoljstva i efikasnosti i zadovoljstva i poverenja, dok je odnos efikasnosti i poverenja takođe bio pozitivan i statistički značajan. ANOVA analiza je pokazala da postoji značajna razlika u prosečnom nivou zadovoljstva korisnika između različitih kanala komunikacije. Regresioni model za predviđanje zadovoljstva na osnovu vremena odziva i izbora komunikacionih kanala pokazao je da kraće vreme odziva i korišćenje video poziva značajno doprinose većem zadovoljstvu. Rezultati pokazuju da izbor pravog kanala komunikacije i brzine odgovora mogu igrati ključnu ulogu u poboljšanju korisničkog iskustva na onlajn platformama.

Ključne reči: eksterna komunikacija, komunikacioni kanali, vreme odziva, korisničko iskustvo, Upwork

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Dalibor Šare,¹ MA

The Belgrade Banking Academy, Union University Belgrade, Serbia

Dejan Tošev²

The Belgrade Banking Academy, Union University Belgrade, Serbia

THE IMPACT OF BUDGET DEFICITS ON GDP IN EU COUNTRIES FROM 2000 TO 2022

ABSTRACT: The budget deficit is a topic that has a significant impact on economic development and stability. It occurs when government spending exceeds revenue, which usually leads to borrowing to cover the difference. The deficit can have both positive and negative effects, depending on how it is used and the current economic situation.

This study investigates the impact of budget deficits on GDP in EU countries. The research covers the period from 2000 to 2022. The aim of the study is to assess the impact of budget deficits on GDP by reviewing relevant literature and using a statistical model, specifically the GLS model in the STATA software package.

In addition to budget deficits as the independent variable, the study also includes variables such as inflation, healthcare, unemployment, and savings. Based on the conducted research, a significant positive impact of budget deficits on GDP in EU countries was identified. Other potential factors that could have an impact were not included in the model, which may lead to bias due to omitted variables.

Although the research employed advanced techniques for analyzing panel data and addressed challenges such as

¹ dalibor.sare@bba.edu.rs

² dtosev@bba.edu.rs

unbalanced panels and the presence of heteroscedasticity and autocorrelation, residual effects may still influence the results. Future studies could include more macroeconomic variables, such as interest rates, trade balances, and the structure of public debt.

Key words: EU, budget deficit, inflation, GDP, GLS model.

INTRODUCTION

The budget represents the financial document of a country, outlining its public revenues and public expenditures. Conceptually, a budget deficit is the difference between a country's revenues and expenditures, where expenditures exceed revenues within a fiscal year, leading the government to borrow to cover the gap. This action increases public debt, which may ultimately lead to a public debt crisis. A proper understanding of the budget deficit is crucial for assessing the overall economic condition of a country and defining appropriate fiscal policies. This phenomenon has become a central issue in the economic policies of many countries, particularly during periods of economic crisis. In the European Union (EU), where member states have diverse economies, the effects of budget deficits on Gross Domestic Product (GDP) are a key topic for both policymakers and researchers.

The period under observation in this research, spanning from 2000 to 2022, encompasses several economic events that significantly impacted budgetary policies and economic conditions in EU member states. During this period, the EU faced the Great Recession of 2008, the Eurozone crisis, and the COVID-19 pandemic, which led to a substantial increase in budget deficits in most EU countries. The global financial crisis demonstrated the critical role of the government during times of crisis. Throughout the observed period, EU member states had varying fiscal structures, i.e., levels of public revenues and expenditures, and implemented different strategies for fiscal adjustments, with the primary goal of consolidating public finances.

The aim of this research is to analyze how budget deficits have impacted GDP in EU countries during the specified period. The primary task is to identify causal relationships and correlations between budget deficits and economic growth, taking into account the economic and institutional characteristics of the observed countries. Additionally, this study will examine other factors that may influence this relationship. It is clear that the issue of the budget deficit and its impact on GDP must be considered by incorporating all aspects of modern society, such as political and economic

factors, to guide appropriate fiscal policies. The results of this research will contribute to a better understanding of the long-term consequences of fiscal policies within the EU, providing guidance for improving future economic strategies.

LITERATURE REVIEW

The emergence of economic integration has led to the budget deficit becoming one of the main problems in public finance. This issue has grown so large that today there is no country without public debt, and almost all countries have a budget deficit (Durkalić & Despotović, 2017). The persistent budget deficit of modern states results from non-productive and military expenditures on the one hand, and difficulties in increasing revenues on the other (Perović & Softić, 2017).

The increase in public expenditure has led most national economies in the EU to experience excessive deficits, forcing them to take drastic measures to recover public finances. A high level of public debt in EU countries can become particularly dangerous if interest rates rise, as the cost of servicing the debt could then become an enormous burden on national economies (Wielechowski, 2011).

The existence of a small and temporary budget deficit may result from cyclical economic fluctuations or a temporary increase in government spending, and as such, does not pose a threat to the economy. However, if the budget deficit is continuous, it can lead the state into significant instability if it is not financed in a timely and appropriate manner. If a country's budget deficit accumulates over a longer period, it leads to an increase in public debt as a direct consequence (Stanulović, 2017). Although government spending can be beneficial for economic growth, it often costs much more than it brings in terms of benefits when the budget falls into deficit due to additional spending. Initially, growth may occur due to government spending, but afterward, many macroeconomic variables are disrupted by this activity (Ullah & Wakeel, 2013).

Given that not all EU countries have the same fiscal framework to ensure the sustainability and stabilization of public finances, Prohl & Schneider (2006) found in their study that in some EU countries, the relationship between budget deficits and public debt relative to GDP is cointegrated over time, while in other member states, this is not the case. The research results of Vdovichen et al. (2022) indicate that the relationship between key fiscal indicators in 23 EU member states, including the tax burden, the share of public expenditures, and deficits as a percentage of GDP, negatively correlates with economic growth indicators. According to a study

by Dornean & Sandu (2013), it was found that an increase in EU expenditures depends only on the unemployment rate in EU countries and their deficits. Similar results were obtained by Kurečić & Kokotović (2016), who, through regression analysis, found that there is a statistically significant correlation between the ratio of public debt to GDP and the unemployment rate.

Sinicakova et al. (2017) criticized the Maastricht criteria in their paper, concluding that the existence of twin deficits in EU countries and the contagion effect on public finances, which is present not only during crisis periods, are caused by overly liberal Maastricht criteria, which have led some countries to have public debt ratios exceeding 98.13% of GDP. The Maastricht Treaty's 3% budget deficit threshold is used as a reference point for simulating debt changes. Kregždě (2013) analyzed this issue and found that this rule is insufficient to ensure a stable or unchanged debt level because when the budget deficit remains at 3%, the debt tends to increase over time for countries with low initial debt, while it decreases for countries with high initial debt, assuming GDP growth of 5%. The GDP growth rate has the opposite effect, meaning that countries with a high GDP growth rate are in a more favorable position, as GDP growth reduces their debt.

To prevent this phenomenon, it is necessary to develop and implement debt policies by integrating instruments such as defining public debt thresholds for short, medium, and long-term periods, assessing public debt risks, and establishing indicators of a country's financial and long-term security. Coordinating public authorities' activities in the process of formulating and implementing debt policies is also essential (Chugunov et al., 2019). Policymakers should strive to maintain public debt and budget deficits at sustainable levels to support the economy. In doing so, they can preserve government revenues and repay current and future public debt. Additionally, they should ensure higher institutional quality, such as better regulation and the rule of law. Better control of corruption would enable more effective and transparent fiscal policies in the long term (Cahyadin et al., 2023). Independent fiscal institutions also have a positive impact on public budget deficits in the EU, especially during systemic and banking crises, as noted by Capraru et al. (2020). Institutional quality is crucial for fiscal policy and significantly affects the fiscal deficit when the institutional framework provides appropriate regulation to rein in fiscal policy (Arif & Arif, 2023). The empirical findings of this study show that increased corruption in government institutions leads to a significant increase in budget deficits, while political stability, reduced bureaucracy, democratic accountability, and the rule of law lead to a decrease in budget deficits.

Rault & Afonso (2009) argued that a budget deficit leads to a current account deficit in their study, based on the fact that a budget deficit raises domestic interest rates, which in turn attracts foreign capital and causes an appreciation of the domestic currency, leading to an increase in the current account deficit. This effect is more pronounced the more open the economy is. Rašković (2023) also found that increasing budget deficits significantly worsen the current account.

In his research, Tanaka (2022, 2023, 2024) emphasizes that a budget deficit is necessary to achieve full employment at constant prices. If the actual budget deficit exceeds the value necessary and sufficient for full employment at constant prices, inflation occurs. Conversely, if the actual budget deficit is smaller than the value needed to achieve full employment at constant prices, a recession occurs.

METODOLOGY

In this research, the results from previous empirical studies and theoretical frameworks were utilized. During the data collection process, the "desk research" method was applied, utilizing two secondary data sources: the annual report of the World Bank and Eurostat. The research was conducted using econometric methodology in the STATA software package, which provides the maximum amount of data from observations per unit of analysis over a defined time period. In this study, two types of variables were used: one as the dependent variable, which in our study is GDP, and the other as independent variables, which in our study are the deficits, inflation, healthcare, unemployment, and savings.

Each time series in the model has the same length (2000-2022), ensuring that each comparative unit of observation has the same number of time series observations. In our case, the number of units of observation exceeds the number of time periods, $N > T$ (27 countries > 22 years). Given that the units of observation are countries, this is a macro panel. The panel data model in this research is as follows:

$$GDP = \alpha + (\text{deficit}_{it} + \text{inflation}_{it} + \text{healthcare}_{it} + \text{unemployment}_{it} + \text{savings}_{it}) + \text{uit}$$

The model we start with is defined as follows: index i denotes the unit of observation (in our case, countries), while index t denotes the time point.

ANALYSIS RESULTS

In the first part of the analysis, descriptive statistics were calculated for the variables used in our model, which provided the following key data essential for our analysis.

Table 1. - Descriptive Statistics

Variables	Obs	Mean	Std. De.	Min	Max	p1	p99	Skew.	Kurt.
BDP	621	2.533	3.908	-14.839	24.475	-8.974	11.107	-.344	7.124
inflation	616	2.962	3.804	-10.118	43.181	-1.939	16.494	4.365	37.961
deficit	621	-2.58	3.567	-32.1	6.9	-12.6	5	-1.292	10.497
healthcare	543	.09	.356	-1.508	2.498	-.886	1.132	1.132	10.18
unemploy ment	594	-.173	1.78	-14.5	16.392	-4.239	6.602	1.423	25.464
savings	589	.169	1.6	-6.305	13.727	-4.997	3.857	.649	12.998

Source: Authors

Based on the obtained data, we can conclude that there are 621 observations available for the GDP variable, making this sample robust and the analysis reliable. The average annual GDP growth during the observed period for this group of countries is 2.533%. The relatively high standard deviation (3.908) indicates significant variability in GDP growth among the observed countries, meaning some countries experienced notably lower or higher growth than the average. The lowest recorded GDP growth was -14.839%, suggesting that one or more countries experienced a significant economic downturn. The maximum GDP growth during the observed period was 24.475%, indicating exceptional economic growth in certain periods for specific countries. The value of p1 (1st percentile) is -8.974%, indicating that 1% of the lowest recorded values are below this value, reflecting extreme negative values occurring in a small number of cases. The value of p99 (99th percentile) is 11.107%, meaning that 1% of the highest recorded GDP values are above this value, indicating very high growth in some cases. The skewness of -0.344 suggests that GDP values are slightly skewed to the left, indicating lower values are more frequent than very high values. The kurtosis of 7.124 indicates the presence of several extreme values deviating from the average.

The inflation variable in our model has 616 observations. The average value of 2.962% indicates moderate price growth on average. The standard deviation (3.804) is relatively high, indicating significant variation in inflation between different countries. The minimum inflation value of -10.118% suggests deflation in some cases. The maximum inflation value of 43.181% indicates extreme inflation in some countries during the observed

period. The value of p1 (1st percentile) at -1.939% suggests that 1% of the lowest inflation values are below this level, indicating deflation in extreme cases. The value of p99 (99th percentile) at 16.494 shows that 1% of the highest inflation values are above this amount, indicating a small number of cases with very high inflation. The skewness of 4.365 suggests that extremely high inflation values are much more frequent than extremely low values. The kurtosis of 37.961 is very high, indicating the presence of numerous extreme values, indicating that inflation was significantly higher than average in some cases.

The deficit variable in this model has 621 observations. The average value of -2.58% indicates that most countries had a budget deficit during the observed period. The standard deviation (3.567) indicates significant differences in budget deficits among countries. The minimum value of -32.1% suggests that the lowest deficit was at this amount, representing a serious fiscal deficit in some countries. The maximum deficit is 6.9%, indicating that some countries even had a budget surplus. The value of p1 at -12.6% suggests that 1% of the lowest deficit values are below this percentage, indicating extreme fiscal deficits. The value of p99 at 5% shows that 1% of the highest deficit values are above this percentage, indicating countries with smaller deficits or even surpluses. The skewness is negative (-1.292), suggesting that extreme deficits are more common than positive fiscal results. The kurtosis of 10.497 is high, indicating the presence of several extreme values, indicating that some deficits are significantly larger than average values.

The healthcare variable in the model has 543 observations. The average value of 0.09% indicates a low but positive growth rate. The standard deviation (0.356) is relatively low, suggesting less variability in healthcare spending among the observed countries. The minimum value of -1.508% indicates the lowest level of healthcare investment, suggesting a reduction in spending in some countries. The maximum value of 2.498% indicates the highest level of investment, with some countries significantly increasing their healthcare spending. The p1 value of -0.886 shows that 1% of the lowest healthcare investment values are below this percentage, indicating countries that have significantly reduced their investments. The p99 value of 1.132 shows that 1% of the highest investment values are above this amount, indicating high growth rates in some countries. The positive skewness (1.132) indicates that extremely high healthcare investments are somewhat more common than extremely low investments. The high kurtosis (10.18) indicates the presence of several extreme values, indicating that some investments are significantly higher than average.

The unemployment variable in the model has 594 observations. The average value of -0.173% indicates a slightly negative unemployment rate, which may suggest a reduction in unemployment on average. The standard deviation of 1.78 indicates significant variation in unemployment rates between different countries. The minimum value of -14.5% shows that the lowest recorded unemployment rate was at this amount, indicating a significant reduction in unemployment in some countries. The highest recorded unemployment rate is 16.392%, indicating high unemployment in some countries. The p1 value of -4.239 shows that 1% of the lowest unemployment values are below this amount, indicating countries with significantly reduced unemployment. The p99 value of 6.602 shows that 1% of the highest unemployment values are above this amount, indicating high unemployment rates in some cases. Positive skewness (1.423) suggests that extremely high unemployment rates are more common than extremely low ones. The high kurtosis of 25.464 indicates the presence of extreme values in unemployment rates, indicating that some countries experienced very high unemployment.

The savings variable in the model has 589 observations. The average savings rate of 0.169% indicates a slightly positive trend in savings. The standard deviation of 1.6 indicates significant variations in savings between different countries. The lowest recorded savings rate of -6.305% indicates negative savings in some cases (where consumption exceeds savings). The highest recorded savings rate is 13.727%, indicating very high savings rates in some countries. The p1 value of -4.997% shows that 1% of the lowest savings values are below this amount. The p99 value of 3.857 shows that 1% of the highest savings values are above this amount, indicating high savings rates in a small number of cases. Positive skewness of 0.649 suggests that extremely high savings rates are somewhat more common than extremely low ones. The high kurtosis of 12.998 indicates the presence of several extreme values, indicating that some countries had very high or low savings rates compared to the average.

The descriptive statistics for the variables used show significant variations between countries and periods, with the presence of extreme values that can significantly affect the analysis and interpretation of the results. These data provide insight into the basic characteristics of the distribution of each variable and enable further analysis of the causes and consequences of these macroeconomic indicators.

The next step is to test the stationarity of the time series variables using the Fisher test (Dickey-Fuller tests), specifically the first-generation unit root test. If the calculated value is greater than the critical value (0.05), we fail to reject the null hypothesis, meaning that all panels contain a unit

root. In our case, this is characteristic of the variables healthcare, savings, and unemployment, while GDP, inflation, and the deficit are stationary variables.

Table 2. - Stationarity of variables according to the Fisher test

Fisher-type unit-root test form		BDP	inflation	deficit	healthcare	savings	unemployment
Based on augmented Dickey-Fuller		p-value	p-value	p-	p-value	0.770	p-
Inverse chi-squared(20)	P	0.0000	0.0000	0.000	0.9947	0.701	0.600
Inverse normal	Z	0.0000	0.0001	0.000	0.9976	0.721	0.873
Inverse logit t(54)	L	0.0000	0.0000	0.000	0.9984	0.778	0.803
Modified inv. chi-	P _m	0.0000	0.0000	0.000	0.9862	0.778	0.623
STATIONARY VARIABLE		YES	NO	NO	NO	NO	NO

Source: Authors

After testing the stationarity of the model variables, correlation testing was conducted using Pearson's coefficient (the coefficient measures the linear relationship between two quantitative variables). One of the assumptions of the model is the absence of linear dependence between the explanatory variables. The primary indicator of correlation is the correlation coefficient, which takes values within the interval between -1 and 1. The relationship between the variables was determined by applying the correlation test to variables of the same level of differencing in the STATA program.

Table 3. - Results of the correlation test of variables

Variable	(1)	(2)	(3)	(4)	(5)	(6)
(1) BDP	1.000					
(2) inflation	0.342	1.000				
(3) deficit	0.435	0.151	1.000			
(4) healthcare	-0.457	-0.038	-0.149	1.000		
(5) unemployment	-0.300	-0.044	-0.222	0.164	1.000	
(6) savings	0.585	0.142	0.146	-0.483	-0.162	1.000

Source: Authors

Based on the obtained data, we concluded that all variables have a certain level of correlation, but none exceed a coefficient of 0.7, which would indicate a strong or very strong correlation. This, in turn, is not good for the model we will use. Following this, regression of the model variables was performed to obtain results regarding the significance level of individual independent variables on the dependent variable, as well as information on the coefficient of determination (R-squared), which represents the square of the multiple correlations. The coefficient of determination explains the

percentage of variation in the dependent variable explained by the independent variables.

Table 4. - Results of the regressed model

BDP	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
deficit	.307	.032	9.50	0	.243	.37	***
inflation	.276	.035	7.86	0	.207	.345	***
healthcare	-2.101	.359	-5.86	0	-2.805	-1.396	***
unemployment	-.274	.062	-4.40	0	-.397	-.152	***
savings	.962	.081	11.92	0	.803	1.12	***
Constant	2.217	.175	12.68	0	1.874	2.561	***
Mean dependent var		2.153	SD dependent var			3.874	
R-squared		0.562	Number of obs			540	
F-test		136.895	Prob > F			0.000	
Akaike crit. (AIC)		2560.654	Bayesian crit. (BIC)			2586.404	

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: Authors

In this model, the coefficient of determination (R-squared = 0.572) shows that 56.2% of the variation in the dependent variable is explained by the model, which suggests that the model has good predictive ability, but also that there is a significant portion of variation that is not explained by the model. The high value of the F-test (136.895) and the very low p-value (0.000) indicate that the model as a whole is statistically significant, i.e., the independent variables collectively have a significant impact on the dependent variable. After performing the regression and determining the significance of individual model variables, multicollinearity was tested using the VIF command, and the following results were obtained.

Table 5. - Results of the multicollinearity test

	VIF	1/VIF
savings	1.346	.743
healthcare	1.327	.753
deficit	1.091	.916
unemployment	1.079	.927
inflation	1.042	.96
Mean VIF	1.177	.

Source: Authors

The obtained results show that there is a small or moderate amount of multicollinearity, but it is not problematic for our model. In order to determine whether it is more appropriate to use the fixed effects (FE) model or the random effects (RE) model, the Hausman test was conducted.

Table 6. - Cluster-Robust Hausman Test

(based on 100 bootstrap repetitions)
b1: obtained from xtreg BDP deficit inflation healthcare unemployment savings,fe
b2: obtained from xtreg BDP deficit inflation healthcare unemployment savings,re
Test: Ho: difference in coefficients not systematic
$\text{chi2}(5) = (b1-b2)' * [V_bootstrapped(b1-b2)]^{-1} * (b1-b2)$
= 3.10
Prob>chi2 = 0.6846

Source: Authors

Using this test, we confirmed that, in our case, it is more appropriate to use the random effects (RE) model. After selecting the model, we tested it for the presence of heteroscedasticity.

Table 7. - White's test of heteroscedasticity

White's test for Ho: homoscedasticity against Ha: unrestricted heteroscedasticity			
chi2(20) = 85.55			
Prob > chi2 = 0.0000			
Source	Chi2	df	p
Heteroskedasticity	85.55	20	0.000
Skewness	8.100	5	0.151
Kurtosis	5.800	1	0.016
Total	99.45	26	0.000

Source: Authors

After testing the model for the presence of heteroscedasticity, the model was then tested for the presence of autocorrelation using the Wooldridge test, which produced the following results:

Tabela 8. - Wooldridge test for autocorrelation

H0: no first-order autocorrelation
F(1, 26) = 15.577
Prob > F = 0.0005

Source: Authors

Taking into account the fact that our model data are unbalanced, and that heteroscedasticity and autocorrelation are present, we used the GLS model,

specifically Prais-Winsten regression (Panel-Corrected Standard Errors - PCSEs, which support unbalanced panels and correct for heteroscedasticity and autocorrelation), using the following command `xtpcse` in STATA, and obtained the following results:

Table 9 - Prais-Winsten regressed model, corrected standard errors for correlated panels (PCSE)

BDP	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
inflation	.227	.066	3.43	.001	.097	.357	***
deficit	.342	.055	6.25	0	.235	.449	***
healthcare	-2.581	.451	-5.72	0	-3.465	-1.697	***
unemployment	-.199	.058	-3.46	.001	-.312	-.087	***
savings	.87	.079	11.00	0	.715	1.025	***
Constant	2.464	.389	6.34	0	1.702	3.226	***
Mean dependent var		2.153	SD dependent var			3.874	
R-squared		0.601	Number of obs			540	
Chi-square		336.619	Prob > chi2			0.000	

*** $p < .01$, ** $p < .05$, * $p < .1$

Source: Authors

INTERPRETATION OF RESULTS

Inflation has a positive and statistically significant impact on GDP. A coefficient of 0.227 suggests that an increase in inflation by 1 unit (percentage point) leads to an average increase in GDP of 0.227 units, holding all other factors constant. The p-value is less than 0.01, indicating high statistical significance ($p < 0.01$), which means there is a very low probability that this effect is due to chance.

Deficit also has a positive and statistically significant impact on GDP. A coefficient of 0.342 means that an increase in the deficit by 1 unit (e.g., percentage of GDP) leads to a 0.342-unit increase in GDP. The results suggest that there is a positive relationship between the deficit and economic growth, which might indicate that budget deficits stimulate the economy, possibly through increased investment in public projects or consumption.

Health expenditure has a negative and statistically significant impact on GDP. A coefficient of -2.581 suggests that an increase in health expenditure by 1 unit leads to a decrease in GDP by 2.581 units. This result may seem counterintuitive but could indicate that excessive health spending in some countries diverts resources from other productive sectors, potentially limiting economic growth. Additionally, this result may depend on the structure of economies and how health expenditure is utilized (e.g., high healthcare costs might burden the economy).

Unemployment has a negative and statistically significant impact on GDP, which is expected. A coefficient of -0.199 means that an increase in unemployment by 1% reduces GDP by 0.199 units. This result aligns with economic theory, as higher unemployment reduces production and aggregate consumption, leading to a decrease in GDP.

Savings have a positive and statistically significant impact on GDP. A coefficient of 0.87 suggests that an increase in savings by 1 unit raises GDP by 0.87 units. Higher savings can provide more capital for investment, which stimulates economic growth.

The constant term is statistically significant and suggests that if all independent variables were zero, GDP would, on average, be 2.464 units.

The R-squared value shows that the model explains about 60.1% of the variation in the dependent variable (GDP). This is a solid value, indicating that the independent variables explain GDP movements fairly well. The p-value of the chi-square test is 0.000, meaning the overall model is statistically significant. This implies that the independent variables, taken together, have a significant impact on GDP.

DISCUSSION

Based on the results obtained from the model, the following conclusions can be drawn for EU countries from 2000 to 2022: inflation, deficit, and savings have had a positive impact on GDP, while healthcare and unemployment have had a negative impact on GDP. The statistical significance of all variables indicates that these factors are crucial for explaining GDP trends in the observed countries.

Inflation (increasing inflation can stimulate economic activity through lower real interest rates, which may encourage investment and consumption, but excessive inflation can have negative effects, so discussing the optimal level would be useful) and deficit (in times of crisis, deficit can increase consumption and support the economy — Keynesian approach; however, long-term effects of high deficits may lead to macroeconomic risks such as rising debt and fiscal unsustainability) are likely to stimulate economic activity through increased consumption and aggregate demand, as evidenced by this study. Unemployment has the expected negative effect on GDP, while the negative impact of healthcare expenditure on GDP may indicate specific factors within this sector in the analyzed countries. The positive impact of savings on GDP is likely related to investments in the economy.

These results provide interesting insights into the relationships between macroeconomic variables and economic growth in the sample.

CONCLUSION

This paper provides a detailed understanding of the relationship between budget deficits and GDP in EU countries from 2000 to 2022, and it can serve as a prediction for future trends. Its results have important implications for fiscal and monetary policymakers, as well as researchers studying macroeconomic trends.

The research highlights several key issues and analyses but also emphasizes the need for further investigation to better understand the dynamics and mechanisms behind the impact of budget deficits on GDP. Effective management of fiscal and monetary policy requires a comprehensive approach that takes into account the broader context of socio-economic factors and national priorities.

REZIME

UTICAJ BUDŽETSKIH DEFICATA NA BDP U ZEMLJAMA EU OD 2000. DO 2022. GODINE

Budžetski deficit je tema koja ima značajan uticaj na ekonomski razvoj i stabilnost. Nastaje kada rashodi vlade premašuju prihode, što obično dovodi do zaduživanja kako bi se pokrio razlika. Deficit može imati i pozitivne i negativne efekte, u zavisnosti od toga kako se koristi i od trenutne ekonomske situacije. Ovaj naučni rad istražuje uticaj budžetskih deficita na GDP u zemljama EU. Istraživanje je sprovedeno za period od 2000. do 2022. godine. Cilj studije je da proceni uticaj budžetskih deficita na GDP pregledom relevantne literature i korišćenjem statističkog modela, konkretno GLS modela u softverskom paketu STATA. Pored budžetskih deficita kao nezavisne varijable, korišćene su i varijable inflacije, zdravlja, nezaposlenosti i štednje. Na osnovu sprovedenog istraživanja, utvrđen je značajan pozitivan uticaj budžetskih deficita na GDP u zemljama EU. Ostali potencijalni faktori koji bi mogli imati uticaj nisu uključeni u model, što može dovesti do pristrasnosti usled izostavljenih varijabli. Iako je istraživanje koristilo napredne tehnike za panel podatke i rešavalo izazove poput nebalansiranih panela i prisustva heteroskedastičnosti i autokorelacije, preostali efekti i dalje mogu uticati na rezultate. Buduće studije mogle bi uključiti više makroekonomskih varijabli, kao što su kamatne stope, trgovinski bilans i struktura javnog duga.

Ključne reči: EU, budžetski defцитi, inflacija, GDP, GLS model.

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Scientific Review Article

Zorana Z. Ivetić, Msc, Assistant¹

University Educons, Sremska Kamenica – Novi Sad
Faculty of security studies

Jovanka M. Tošić, Msc, Assistant²

University Educons, Sremska Kamenica – Novi Sad
Faculty of security studies

LEGAL FRAMEWORK OF EMERGENCY SITUATIONS IN THE AUTONOMOUS PROVINCE OF VOJVODINA

ABSTRACT: Emergency situations are a reality in every state and society, including the Republic of Serbia and its Autonomous Province of Vojvodina. Whether triggered by natural disasters or human actions, such crises result in significant loss of life, severe environmental damage, and substantial material losses. Defining an adequate legal framework for emergency situations is a key element in managing crises and protecting the population from various threats, including natural disasters, technological failures, epidemics, and various social conflicts. The focus of this paper is on emergency situations, more precisely, the analysis of legal regulations related to crisis management in the territory of the Autonomous Province of Vojvodina, with an emphasis on the Law on Disaster Risk Reduction and Emergency Management. The study employs the positive legal method and the logical methods of induction and deduction for analysis.

Key words: emergency situation, security, law, Autonomous of Vojvodina, Republic of Serbia

¹ zorana.ivetic@educons.edu.rs

² jovanka.tosic@educons.edu.rs

INTRODUCTION

As humanity entered the 21st century, its population grew rapidly alongside remarkable technical and technological advancements. However, this progress has introduced numerous security challenges and risks. Paradoxically, despite advancements, people increasingly feel insecure. Technological development accelerates the consumption of natural resources and significantly affects ecological systems, contributing to the rising frequency of natural disasters. These disasters are often interconnected, with one triggering another. While natural disasters have always been a part of human history, their occurrence and severity are escalating. The destructive impact of natural disasters, along with technological accidents and various social conflicts, is increasingly resulting in emergency situations.

An emergency situation can be defined as a state in which the normal conditions of life and societal functioning are disrupted due to natural disasters, technological accidents, epidemics, terrorist attacks, or other events. In addition, effective response to emergency situations requires additional forces and resources, special measures, and coordinated actions to protect life, health, property, and the environment. Accordingly, it is necessary for the state to have adequate legal frameworks so that all elements of the system can react successfully.

In the Republic of Serbia, there is a defined legal framework that directly and indirectly regulates the issue of emergency situations, its stakeholders, and response forces. The paper will focus on a specific part of the territory of the Republic of Serbia, more precisely, the geographical area of Vojvodina. Vojvodina is a province within the Republic of Serbia, with a special status of autonomy. The legal status of the Autonomous Province of Vojvodina is regulated by the Constitution of the Republic of Serbia, the Law on Establishing the Jurisdiction of the Autonomous Province of Vojvodina, and the Statute of the Autonomous Province of Vojvodina.

The main subject of research in this paper is emergency situations, more precisely, the analysis of legal regulations related to emergency situations in the territory of the Autonomous Province of Vojvodina. The paper will analyze the current legal framework of the Republic of Serbia, which directly affects the Autonomous Province of Vojvodina. The study will employ the positive legal method and the logical methods of induction and deduction for analysis.

The paper is divided into four logically connected parts, and together with the introduction and conclusion, it forms a whole. In the first part of the paper, the legal status of the Autonomous Province of Vojvodina will be analyzed. In the second part of the paper, the concept of an emergency situation will be defined, and the basic characteristics of emergency situations

will be specified, along with a classification. The last two parts will be dedicated to the review of legislation related to emergency situations, with the last part focusing on the Law on Disaster Risk Reduction and Emergency Management.

LEGAL STATUS OF THE AUTONOMOUS PROVINCE OF VOJVODINA

Vojvodina is one of the two autonomous provinces within the Republic of Serbia. Throughout history, various peoples have inhabited and conquered its territory. It officially became part of Serbia after World War I. Vojvodina was granted the status of an autonomous province within the Socialist Federal Republic of Yugoslavia, a status it retains today as part of the Republic of Serbia.

Based on Article 185, paragraph 2 of the Constitution of the Republic of Serbia (Constitution of the Republic of Serbia, 115/2021) and the Decision on granting prior consent by the National Assembly of the Republic of Serbia (Decision on granting prior consent of the National Assembly of the Republic of Serbia, 54/2014), the Assembly of the Autonomous Province of Vojvodina, in the session held on May 22, 2014, adopted the Statute of the Autonomous Province of Vojvodina. According to Article 1 of the Statute of the Autonomous Province of Vojvodina, the Autonomous Province of Vojvodina (hereinafter: AP Vojvodina) is an autonomous territorial unit of the Republic of Serbia in which citizens exercise the right to provincial autonomy in accordance with the Constitution and the law. AP Vojvodina is an inseparable part of the Republic of Serbia, where European principles and values are nurtured.

The Autonomous Province of Vojvodina holds the status of a legal entity. Its authority is defined by a decision of the Assembly of AP Vojvodina, which represents the province as a legal entity. Through this role, it exercises all the rights and obligations that come with being the founder of public enterprises and institutions, in accordance with the law (Article 2). Novi Sad is the administrative center of the Autonomous Province of Vojvodina, serving as the location of the provincial authorities' headquarters (Article 10).

The highest legal document of the Autonomous Province of Vojvodina is its Statute. In addition to the Statute, the bodies of AP Vojvodina adopt legal and other acts, including Provincial Assembly decisions on matters that fall directly within the province's jurisdiction under the Constitution or are designated by law as issues of provincial significance. Other acts include provincial regulations, decisions, declarations, resolutions, recommendations, rules of procedure, instructions, rulings, conclusions, and various other legal

instruments. All legal acts of AP Vojvodina must comply with the Constitution and the laws of the Republic of Serbia.

The Autonomous Province of Vojvodina, through its governing bodies, carries out various functions, including adopting and amending the Statute. It enacts Provincial Assembly decisions and other acts on matters of provincial significance, in accordance with the law. Additionally, it implements assembly decisions by adopting regulations for their enforcement, as well as executing laws and related regulations when authorized by law. The province oversees the selection, organization, and functioning of bodies, agencies, public enterprises, and institutions it establishes. It determines which languages of national minorities (national communities) will be in official use within provincial authorities, in line with legal provisions. Furthermore, it regulates the rights, obligations, and status of elected, appointed, and employed individuals within provincial institutions. AP Vojvodina is also responsible for collecting and processing statistical data of provincial interest, prescribing misdemeanors for violations of provincial regulations, and calling provincial referendums. It adopts plans and programs for balanced economic development in alignment with national laws and Serbia's development plan. Additionally, it makes decisions regarding the use of its own revenue, borrows in accordance with the law, and approves the budget and final accounts. The province establishes and supervises organizations, agencies, public enterprises, institutions, funds, and business companies. It also introduces provincial recognitions and awards for individuals and legal entities and regulates other matters of provincial significance in accordance with the law and its Statute (Article 25). In carrying out their responsibilities, the authorities of AP Vojvodina collaborate with the Republican Government and local self-government units.

The territory of AP Vojvodina is composed of local self-government units, and the right to provincial autonomy is vested in its citizens. They exercise this right directly through popular initiatives and referendums, as well as through their freely elected representatives (Article 5).

The Assembly of AP Vojvodina is the highest governing body of the province, responsible for legislative and other functions in accordance with the Constitution, the law, and the Statute. It adopts and amends the Statute, passes various legal acts, and oversees the work of the Provincial Government, including electing, dismissing, and supervising its members. The Assembly reviews regular and extraordinary reports on government activities and adopts development programs, strategic plans, and financial documents such as the budget and final accounts. It has the authority to decide on provincial borrowing, call referendums, and establish agreements with corresponding territorial communities in other states, in accordance with the law. Additionally, it regulates the election, mandate, and status of deputies and

electoral units and defines the rights, duties, and positions of elected, appointed, and employed individuals within provincial institutions when not regulated by law. The Assembly prescribes penalties for violations of provincial regulations and appoints key officials, including the president and vice president of the Assembly, the Provincial Government leadership, and other provincial representatives. It also appoints the provincial ombudsman and may establish development funds or a bank to support economic growth. Furthermore, it determines the structure and functions of provincial agencies, public enterprises, and institutions, regulating employment matters not covered by law. The Assembly has the authority to propose laws and regulations to the National Assembly of the Republic of Serbia, adopt its own rules of procedure, and carry out other duties prescribed by law and the Statute (Article 31).

The Provincial Government serves as the executive body of AP Vojvodina. Its work is overseen by the Assembly of AP Vojvodina, to which it is accountable (Article 44). The Provincial Government consists of the President, one or more Vice Presidents, and members of the Provincial Government (Article 46). Within its jurisdiction, the Provincial Government carries out various responsibilities to ensure the effective governance of AP Vojvodina. It implements decisions and other general acts adopted by the Provincial Assembly and enforces laws when authorized to do so. Additionally, it adopts provincial ordinances and other general acts necessary for executing laws and assembly decisions, as permitted by law or assembly resolutions. The Provincial Government organizes and oversees professional and other services required for tasks within its scope, in accordance with the law, the Statute, and assembly decisions. It submits budget proposals and final accounts to the Assembly of AP Vojvodina, as well as programmatic, developmental, and planning documents, taking necessary measures for their implementation. The government also proposes assembly decisions and other general acts for consideration, appoints and dismisses provincial officials who are not elected or removed by the Assembly, and directs, coordinates, and supervises the work of provincial administrative bodies. Moreover, it oversees companies and institutions that perform public functions or other tasks of provincial significance, provided they are founded by AP Vojvodina. The management and administration of public property fall under its responsibilities, ensuring compliance with the law and regularly reporting to the Assembly. At the request of the Assembly, its working bodies, or its President, the Provincial Government provides opinions on proposed assembly decisions or general acts submitted by other entities. In situations where the Assembly is unable to convene, it adopts general acts and takes necessary measures in response to natural disasters or other emergencies, acting in accordance with legal provisions. Furthermore, the Provincial

Government proposes agreements with corresponding territorial communities of other states for Assembly approval. It submits an annual report on its activities and provides extraordinary reports upon request. Lastly, it establishes its own rules of procedure and carries out other duties as determined by law, the Statute of AP Vojvodina, and assembly decisions (Article 45).

The legal status of the Autonomous Province of Vojvodina is regulated by the Law on Establishing the Jurisdiction of the Autonomous Province of Vojvodina. This law defines the competences of the Autonomous Province of Vojvodina and addresses other issues of importance for the position of the Autonomous Province of Vojvodina.

According to the same law, the Autonomous Province of Vojvodina can cooperate with corresponding territorial communities of other states, within the framework of the foreign policy of the Republic of Serbia, while respecting the territorial unity and legal order of the Republic of Serbia. In addition, the Autonomous Province of Vojvodina can conclude interregional agreements within its jurisdiction and can be a member of European and international regional associations (Article 3). In exercising their competences, the bodies of AP Vojvodina cooperate with the Republican authorities and the bodies of the local self-government units (Article 5).

OVERVIEW OF THE LEGAL REGULATIONS OF THE AUTONOMOUS PROVINCE OF VOJVODINA REGARDING EMERGENCY SITUATIONS

Disruptions to living and working conditions can arise from natural disasters or unforeseen events, leading to unrest within communities and among individuals. An emergency situation is marked by its unpredictability, interference with daily life and work, financial and material losses, and the need to mobilize additional resources from a broader national scope to alleviate and address the consequences. While emergencies are frequently linked to natural and man-made disasters, they encompass any scenario that necessitates the coordinated involvement of multiple entities to respond to events beyond the usual course of affairs.

The area of emergency situations in the Autonomous Province of Vojvodina is regulated by a series of laws and by-laws, which were adopted at the level of the Republic of Serbia, but also by certain regulations adopted by the competent authorities of the Autonomous Province. Some of the most important laws are: the Law on Disaster Risk Reduction and Emergency Management (Law on Disaster Risk Reduction and Emergency Management, 87/2018), the Law on Fire Protection (Law on Fire Protection, 20/2015), the

Law on Reconstruction after Natural and Other Disasters (Law on Reconstruction from Natural and Other Disasters, 112/2015), and the Law on Civil Defense (Law on Civil Defense, 54/2015).

In addition to the legal regulation of the area of emergency situations, various decisions, instructions, rules, and regulations are also important for the legal regulation of this area. Among other things, the following are of importance:

Instructions on the methodology for the preparation of risk assessments from natural and other disasters and protection and rescue plans in emergency situations (Instructions on the methodology for the preparation of the assessment of vulnerability to natural and other disasters and protection and rescue plans in emergency situations, 18/2017), Regulation on the implementation of evacuation (Regulation on the implementation of evacuation, 22/2011), Regulation on the content and method of preparation of protection and rescue plans in emergency situations (Regulation on the content and method of preparing protection and rescue plans in emergency situations, 8/2011), Regulation on mandatory means and equipment for personal, mutual, and collective protection against natural disasters and other accidents (Regulation on mandatory means and equipment for personal, mutual, and collective protection against natural disasters and other accidents, 3/2011), Regulation on the composition and method of operation of the headquarters for emergency situations (Regulation on the composition and manner of operation of the headquarters for emergency situations, 98/2010), Regulation on the amount and method of exercising the right to one-time financial assistance (Regulation on the amount and method of exercising the right to one-time financial assistance, 98/2010), Regulation on the method of engaging resources for the purposes of protection and rescue and the method of exercising the right to compensation for the use of the same (Regulation on the method of engaging resources for the purposes of protection and rescue and the method of exercising the right to compensation for the use of the same, 10/2013), Regulation on the classification of buildings, activities, and land into fire hazard categories (Regulation on the classification of buildings, activities, and land into fire hazard categories, 76/2010), Rulebook on the organization and method of use of specialized civil protection units (Rulebook on the organization and method of use of specialized civil protection units, 26/2011), Rulebook on the method of collection and payment terms of funds that are directed as designated income of the Budget Fund for emergency situations (Rulebook on the method of collection and payment terms of funds that are directed as designated income of the Budget Fund for emergency situations, 28/2011), Rulebook on information on danger, measures, and procedures in the event of an accident (Rulebook on information on danger, measures, and procedures in the event of an accident, 18/2012), Rulebook on

the method of determining the value of the construction part of buildings and the method of calculating compensation for shelters (Rulebook on the method of determining the value of the construction part of buildings and the method of calculating compensation for shelters, 78/2012), Rulebook on the method of preparation and content of the accident protection plan (Rulebook on the method of preparation and content of the accident protection plan, 82/2012), Rulebook on the types and quantities of hazardous materials, objects, and other criteria based on which the Accident Protection Plan is drawn up and measures are taken to prevent accidents and limit the impact of accidents on people's lives and health, material goods, and the environment (Rulebook on the types and quantities of hazardous materials, objects, and other criteria based on which the Accident Protection Plan is drawn up and measures are taken to prevent accidents and limit the impact of accidents on people's lives and health, material goods, and the environment, 48/2016), Rulebook on the program, method, and costs of taking a professional exam, the procedure for issuing and the appearance of a license for risk assessment (Rulebook on the program, method, and costs of taking a professional exam, the procedure for issuing and the appearance of the license for risk assessment, 8/2013), Rulebook on training, curricula, programs, and norms of teaching aids and equipment for training members of civil protection (Rulebook on training, curricula, programs, and norms of teaching aids and equipment for training members of civil protection, 8/2013), Rulebook on the uniform and insignia of civil protection, insignia of functions, specialties, and identity card of members of civil protection (Rulebook on the uniform and insignia of civil protection, insignia of functions, specialties, and identity card of members of civil protection, 84/2014), Rulebook on the method and content of the fire protection plan of the autonomous province, local self-government units, and subjects classified into the first and second categories (Rulebook on the method and content of the fire protection plan of the autonomous province, local self-government units, and subjects classified into the first and second categories, 73/2010), Rulebook on the conditions that must be met by legal persons registered to carry out special training for persons working in fire protection (Rulebook on the conditions that must be met by legal persons registered to carry out special training for persons working in fire protection, 86/2011), Rulebook on taking a professional exam and conditions for obtaining a license and authorization for the preparation of the Main Fire Protection Project and special fire protection systems and measures (Rulebook on taking a professional exam and conditions for obtaining a license and authorization for the preparation of the Main Fire Protection Project and special fire protection systems and measures, 87/2013), Rulebook on the content and manner of managing records on members of authorities, units, services, and other participants and on means and equipment in civil protection

(Rulebook on the content and manner of managing records on members of authorities, units, services, and other participants and on means and equipment in civil protection, 91/2013), Decision on the determination of authorized and qualified legal entities of importance for protection and rescue in the Republic of Serbia (Decision on the determination of authorized and qualified legal entities of importance for protection and rescue in the Republic of Serbia, 31/2018), Decision on the establishment of the Budget Fund for emergency situations (Decision on the establishment of the Budget Fund for emergency situations, 92/2010), Instructions on the unified methodology for assessing damages from natural disasters (Instructions on the unified methodology for assessing damages from natural disasters, 92/2010), Decision on the formation of the provincial headquarters for emergency situations (Decision on the formation of the provincial headquarters for emergency situations, 71/2016), Decision on the organization and functioning of civil protection on the territory of the Autonomous Province of Vojvodina (Decision on the organization and functioning of civil protection on the territory of the Autonomous Province of Vojvodina, 13/2013).

In addition to the above-mentioned regulations, several laws indirectly regulate emergency situations. Among the most important are: the Law on Health Care (Law on Health Care, 105/2017), the Law on Public Health (Law on Public Health, 15/2016), the Law on Transport of Dangerous Goods (Law on Transport of Dangerous Goods, 83/2018), the Law on Waters (Law on Waters, 101/2016), and the Law on Meteorological and Hydrological Activity (Law on Meteorological and Hydrological Activity, 88/2010).

As can be concluded, the field of emergency situations is not codified, but is regulated by a large number of different laws, by-laws and regulations.

THE LAW ON DISASTER RISK REDUCTION AND EMERGENCY MANAGEMENT

The main goal and reason for the adoption of the Law on Risk Reduction and Emergency Management was the need to legally regulate the system of disaster risk reduction and emergency management as part of the unified national security system, in a consistent manner, by creating legal conditions for the establishment of a unified and integrated system, while at the same time aligning the system of organization and functioning with the actual needs of protecting and saving the population and material assets from natural and other disasters.

In 2018, the National Assembly of the Republic of Serbia adopted the Law on Disaster Risk Reduction and Emergency Management. (Law on Disaster Risk Reduction and Emergency Management, 87/2018.)

The Law on Disaster Risk Reduction and Emergency Management (hereinafter: the Law) regulates: disaster risk reduction, prevention, and strengthening of individual and community resilience and readiness to respond to the consequences of disasters; protection and rescue of people, material and cultural assets; rights and obligations of citizens, associations, legal entities, and bodies of local self-government units and autonomous provinces of the Republic of Serbia; management of emergency situations; functioning of civil protection; early warning, notification, and warning; international cooperation; inspection supervision; and other issues of importance for the organization and functioning of the disaster risk reduction and emergency management system. (Article 1.)

Disaster risk reduction is defined by the Law as a policy that is established and conducted with the aim of preventing new and reducing existing risks through the implementation of integrated and inclusive economic, social, educational, normative, health, cultural, technological, political, and institutional measures that strengthen resilience and community preparedness for responding to and mitigating the consequences of disasters, thereby strengthening community resilience.

An emergency situation, as defined by the same article of the Law, is a situation that arises upon declaration by the competent authority when the risks and threats, or the resulting consequences for the population, the environment, and material and cultural assets, are of such magnitude and intensity that their occurrence or consequences cannot be prevented or eliminated through the regular actions of the competent authorities and services. In such cases, it is necessary to use special measures, forces, and means with an enhanced work regime for their mitigation and elimination.

The law also defines appropriate principles related to disaster risk reduction and emergency management, namely: (Article 4)

1. Principle of priority;
2. The principle of integrated action and intersectoral cooperation;
3. The principle of the primary role of local communities;
4. The principle of gradualness in the use of forces and resources;
5. The principle of equality and protection of human rights;
6. The principle of participation and solidarity i
7. The principle of informing the public.

The law specifically regulates the disaster risk reduction system and the management of emergency situations. This system is an integral part of the national security system; it is an integrated form of management and organization of the subjects of this system for the implementation of preventive and operational measures and the execution of the tasks of protecting and rescuing people from the consequences of disasters, including

recovery measures from those consequences. Disaster risk reduction, according to Article 11 of the Law, includes the system of measures and activities determined by the National Strategy in the field of disaster risk reduction and emergency management, the National Disaster Risk Management Program, the law prescribing reconstruction after natural and other disasters, the law, and other acts, with the aim of preventing new risks and reducing the consequences of existing ones through the implementation of economic, social, educational, normative, health, cultural, technological, political, and institutional measures that strengthen the resilience and preparedness of the community to respond to and mitigate the consequences of resulting disasters, thereby achieving strengthened community resilience.

Subjects of the system of disaster risk reduction and emergency management are state administration bodies, bodies of autonomous provinces, local self-government units, public services, business companies, and other legal entities and entrepreneurs, civil society organizations, educational institutions, scientific research organizations, public agencies, and others, which, in accordance with the law, other general acts, plans, programs, and other documents, participate in the determination of measures and activities important for risk reduction and the management of emergency situations. The unity of action of the subjects of the system of disaster risk reduction and emergency management at the level of the Republic of Serbia is ensured through the National Platform for Risk Reduction (Article 13).

The National Platform for Risk Reduction is a platform for considering and defining issues of the greatest importance for the system of disaster risk reduction and emergency management, which ensures the exchange of opinions, knowledge, innovations, and experience in the field of risk reduction, proposes disaster risk reduction policy measures and activities, and the management of emergency situations, and strengthens cooperation and coordination mechanisms at the national and international levels. The Republic Headquarters for Emergency Situations has the role of the National Platform. In addition to the Republic Headquarters for Emergency Situations, representatives of the academic community, local self-government, and civil society organizations, as well as other subjects of the disaster risk reduction system, also participate (Article 14).

The law provides for the obligation to prepare a risk assessment study. A disaster risk assessment identifies the type, character, and origin of certain risks from the occurrence of disasters, the degree of vulnerability, the factors that cause them or increase the degree of possible danger, the consequences that can occur for the life and health of people, the environment, material and cultural assets, the performance of public services and economic activities, as well as other factors of importance for the development of usual life, economic, and social activities (Article 15).

In the continuation of the article of the Law, it is stated that the assessment of the risk of disasters is made and adopted by the Republic of Serbia, autonomous provinces, local self-government units, and subjects of special importance for protection and rescue, with the exception of federations, clubs, and associations; economic companies; health institutions, except pharmacies; preschool and school institutions and faculties for all facilities where children stay, i.e., facilities where teaching takes place; and social protection institutions for facilities where users reside. Companies and other legal entities that have organizational units in their composition whose capacities, scope, and importance of activities are of particular importance for the economy of the Republic of Serbia in the fields of energy, telecommunications, mining, and transport, prepare a risk assessment for those organizational units as well. The risk assessment is made and adopted by legal entities that manage business, trade, sports, catering, accommodation, and leisure facilities with a capacity of more than 100 people, and if the facilities are intended for the stay of children up to 14 years of age, regardless of the capacity. Other legal entities prepare their disaster risk assessment based on the recommendation of the headquarters for emergency situations of the local self-government unit. The disaster risk assessment is periodically updated according to needs and new circumstances.

The law, in Article 16, foresees the obligation to develop and adopt a disaster risk reduction plan, and in Article 17, the obligation to develop a protection and rescue plan. These two plans determine concrete preventive, organizational, technical, financial, normative, supervisory, educational, and other measures and activities, which the competent state authorities and other subjects are obliged to undertake in order to reduce the risk of disasters and mitigate their consequences.

The disaster risk register is defined, in Article 22 of the Law, as an interactive, electronic, geographic information database for the territory of the Republic of Serbia, managed by the Ministry in cooperation with competent state administration bodies, other state bodies, and holders of public authority. The risk register contains data important for risk management, namely: (Article 22)

- physical-geographic data on the area affected by the risk;
- data on the number and structure, as well as the exposure and vulnerability of the population, which may be affected by the occurrence of a disaster;
- data on residential buildings and buildings of other uses, infrastructure and other objects, their exposure and vulnerability;
- data on previous disasters and their consequences;
- description and characteristics of the hazard i

- other data of importance for risk reduction.

An important part of the Law is also the provisions related to Autonomous Provinces, local self-governments, economic and legal entities, and their scope in the area of disaster risk reduction and emergency management. The law lists the rights and obligations of citizens.

According to the Law, a state of emergency is declared when the risks and threats, or the resulting consequences of a disaster for the population, material and cultural goods, or the environment, are of such scope and intensity that their occurrence or consequences cannot be prevented or eliminated by the regular action of the competent authorities and services. For their mitigation and elimination, it is necessary to use special measures, additional forces, and means with an enhanced work regime. (Article 38) A state of emergency is declared immediately upon knowledge, but it can also be declared after its occurrence if the immediate danger of the occurrence of an emergency situation could not be foreseen or if, due to other circumstances, it could not be declared immediately after the knowledge of the immediate danger of its occurrence. A state of emergency can be declared: for the territory of the Republic of Serbia, for the territory of the autonomous province, for the territory of the city municipality, or for the territory of part of the municipality. When the need to implement measures of protection and rescue from disasters ceases, the state of emergency is abolished.

In order to monitor disaster risk reduction activities and coordination and management in emergency situations, emergency staffs are formed. The headquarters for emergency situations can be formed: for the territory of the Republic of Serbia, for the territory of the autonomous province, for the territory of the administrative district, for the territory of the city, and for the territory of the municipality. The law regulates the composition and responsibilities of the headquarters for emergency situations. According to Article 43 of the Law, the Headquarters for Emergency Situations performs the following tasks:

- managing and coordinating the work of the subjects of the system of disaster risk reduction and emergency management on the implementation of established tasks;
- managing and coordinating the implementation of civil protection measures and tasks;
- reviews risk assessments, protection and rescue plans and other planning documents and makes recommendations for their improvement;
- monitors the state and organization of disaster risk reduction and emergency management systems and proposes measures for their improvement;

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- orders the use of disaster risk reduction and emergency management system forces, aid assets and other assets used in emergency situations;
 - takes care of regular information and notifying the population about risks and dangers and the measures taken;
 - assesses the danger from the emergence of an emergency situation and submits a proposal for the declaration and cancellation of an emergency situation;
 - orders the readiness of entities and the strength of disaster risk reduction and emergency management systems;
 - cooperates with other headquarters for emergency situations;
 - engages subjects of special importance;
 - participates in the organization and implementation of measures and tasks of restoration, reconstruction and rehabilitation, taking into account the reduction of the risk of future emergency situations;
 - prepares a proposal for an annual work plan and a proposal for an annual work report and submits it to the competent authority for approval;
 - trains professional-operational teams to perform specific tasks in the field of protection and rescue.

The law on disaster risk reduction and emergency management puts prevention first. In addition, the law emphasizes international cooperation in the event of natural and other disasters. A special form of international cooperation is the sending of international aid in the form of international teams for protection and rescue, equipment and resources necessary for operations to protect and rescue citizens in emergency situations. This means: (Article 102)

- direct communication with competent authorities of other countries and international organizations in connection with the request, receipt and transit of international aid;
- coordination of crossing national borders during the reception, provision and transit of international aid;
- coordination of acceptance and distribution of international aid on the territory of the Republic of Serbia;
- coordination of activities of international forces for protection and rescue on the territory of the Republic of Serbia;
- coordination of the deployment of protection and rescue forces in the form of international protection and rescue teams and humanitarian aid in the form of equipment and funds for

operations to protect and rescue citizens in emergency situations in other countries and international organizations.

The law prescribes fines for misdemeanors by natural persons, as well as fines for misdemeanors by legal entities and entrepreneurs, trustees and deputies of civil protection, responsible persons in state bodies, bodies of autonomous provinces and bodies of local self-government units.

CONCLUSION

The legal framework of emergency situations on the territory of the Autonomous Province of Vojvodina, i.e., the territory of the Republic of Serbia, represents a key aspect of managing emergency situations and protecting the population from various types of threats, including natural disasters, technological breakdowns, epidemics, and other threatening phenomena. By analyzing the legal regulations, it can be concluded that the Republic of Serbia, that is, the Autonomous Province of Vojvodina, has established a comprehensive system of legal acts and procedures that enable effective action in emergency situations.

Basic legal acts, such as the Law on Disaster Risk Reduction and Emergency Management, as well as a number of by-laws, lay the foundations for the organization and coordination of all relevant entities. These laws define the roles and responsibilities of state bodies, local governments, public companies, non-governmental organizations, and citizens. Also, measures for risk reduction, prevention, and remediation of the consequences of emergency situations are foreseen, thereby strengthening society's resilience to crises. As can be concluded, the field of emergency situations is not codified, but is regulated by a large number of different laws, by-laws, and regulations.

However, the need for continuous improvement of the legal framework is evident. First of all, it refers to the adoption of the National Security Strategy of the Republic of Serbia, as well as the National Strategy for Protection and Rescue in Emergency Situations. Continuous adaptation and improvement of the legal framework is necessary so that the system can adequately respond to the increasingly complex challenges of the modern world. Only through the synergy of legislative measures, institutional cooperation, and active participation of all social segments is it possible to build a more resilient and safer society.

REZIME
PRAVNI OKVIR VANREDNIH SITUACIJA U AUTONOMNOJ
POKRAJINI VOJVODINI

Vanredne situacije predstavljaju element svake države i društva, pa tako i Republike Srbije i njene Autonomne pokrajine Vojvodine. Bilo da su izazvane prirodnim katastrofama ili ljudskim delovanjima, ovakve krize dovode do značajnog gubitka ljudskih života, ozbiljne štete na životnoj sredini i velikih materijalnih gubitaka. Definisane adekvatnog pravnog okvira vanrednih situacija predstavlja ključni element upravljanja vanrednim situacijama i zaštiti stanovništva od različitih pretnji, uključujući prirodne katastrofe, tehnološke havarije, epidemije i različite društvene sukobe. Predmet istraživanja u ovom radu jesu vanredne situacije, preciznije, analiza pravnih propisa koji se odnose na vanredne situacije na teritoriji Autonomne pokrajine Vojvodine, sa akcentom na Zakon o smanjenju rizika od katastrofa i upravljanju vanrednim situacijama. U analizi su korišćene pozitivno-pravne metode i logički metodi indukcije i dedukcije.

Ključne reči: vanredna situacija, bezbednost, pravo, Autonomna pokrajina Vojvodina, Republika Srbija

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PREGLED RECENZENATA

Prof. dr Nikola Gradojević

University of Guelph, Department of Economics and Finance, Canada

Prof. dr Petar Veselinović

Ekonomski fakultet, Univerziteta u Kragujevcu

Prof dr Olja Munitlak-Ivanović

Univerzitet u Novom Sadu, Prirodno matematički fakultet, Departman za Geografiju, turizam i hotelijerstvo

Prof. dr Marko Malović

Fakultet poslovne ekonomije Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

Prof. dr Dragan Golubović

Fakultet poslovne ekonomije Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

Prof. dr Rajko Radović

Fakultet poslovne ekonomije Bijeljina, Univerziteta Istočno Sarajevo, Bosna i Hercegovina

Prof. dr Jurica Pavičić

Ekonomski fakultet, Sveučilište u Zagrebu, Republika Hrvatska

Prof. dr Slobodan Morača, vanredni profesor

Fakultet tehničkih nauka, Univerzitet u Novom Sadu

Prof. dr Ljubinko Jovanović

Fakultet ekološke poljoprivrede, Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

Prof. dr Milica Andevski

Filozofski fakultet, Univerzitet u Novom Sadu

Prof. dr Marina Blagojević Hjuson (Hughson)

Institut za kriminološka i sociološka istraživanja, Beograd

dr Zoran Milošević

Slobomir P Univerziteta, Bijeljina, Republika Srpska, BiH Fakultet za ekonomiju i menadžment

Prof. dr Slađana Čabrilo, vanredni profesor

I-Shou University, Department of International Business Administration,
Kaohsiung, Taiwan (R.O.C.)

Prof. dr Aleksandar Prnjat, vanredni profesor

Alfa univerzitet Beograd

Prof. dr Radoje Brković

Pravni fakultet, Univerziteta u Kragujevcu

Prof. dr Milenko Dželetović, vanredni profesor

Fakultet bezbednosti, Univerziteta u Beogradu

Prof. dr Ivica Nikolić

Fakultet poslovne ekonomije Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

dr Marko Jeločnik, istraživač saradnik,

Institut za ekonomiku poljoprivrede, Beograd

Prof. dr Vladimir Zakić, vanredni profesor

Poljoprivredni fakultet Beograd, Univerzitet Beograd

Prof. dr Leposava Grubić Nešić

Fakultet tehničkih nauka - Univerzitet u Novom Sadu

Prof. dr Vladimir Đaković, vanredni profesor

Fakultet tehničkih nauka - Univerzitet u Novom Sadu

Prof. dr Branislav Mašić

Ekonomski fakultet Pale Univerzitet Istočno Sarajevo, BiH

Prof. dr Plamen Patev

I-Shou University, International College, Department of International Finance,
Kaohsiung, Taiwan

Prof. dr Shailender Singh

I-Shou University, International College, Department of International Finance,
Kaohsiung, Taiwan

Prof. dr Dejan Jakšić

Ekonomski fakultet Subotica, Univerzitet u Novom Sadu

Prof. dr Zoran Đokić, vanredni profesor

Fakultet za sport i turizam Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

Prof. dr Aleksandar Gračanac

Fakultet za poslovno industrijski menadžment Univerzitet Union Beograd

Prof. dr Guych Nuryyev

I-Shou University, International College, Department of International Finance,
Kaohsiung, Taiwan

Doc. dr Jelena Jotić

Fakultet poslovne ekonomije Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

Prof. dr Irena Stanišić, profesor strukovnih studija

Visoka škola strukovnih studija za vaspitače, Kruševac

Doc. dr Biljana Dodić

Fakultet poslovne ekonomije Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

Doc. dr Iva Škrbić

Fakultet za sport i turizam Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

Doc. dr Ivana Volić

Fakultet za sport i turizam Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

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Fakultet poslovne ekonomije Univerziteta Edukons u Sremskoj Kamenici - Novom Sadu

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