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ARE SANCTIONS FOR LOSERS? A NETWORK STUDY OF TRADE SANCTIONS

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Paper presented at the 11th International Scientific Symposium „EkonBiz: Impact of geopolitical changes on the national economy“, Bijeljina, 22 – 23th June 2023.

Abstract: Studies built on dependency and world-system theory using network approaches have showed that international trade is structured into clusters of 'core' and 'peripheral' countries performing distinct functions. However, few have used these methods to investigate how sanctions affect the position of the countries involved in the capitalist world-economy. Yet, this topic has acquired pressing relevance due to the emergence of economic warfare as a key geopolitical weapon since the 1950s. And even more so in light of the preeminent role that sanctions have played in the US and their allies' response to the Russian-Ukrainian war. Applying several clustering techniques designed for complex and temporal networks, this paper shows that a shift in the pattern of commerce away from sanctioning countries and towards neutral/friendly ones. Additionally, there are suggestions that these shifts may lead to the creation of an alternative 'core' that interacts with the world-economy's periphery bypassing traditional 'core' countries such as EU member States and the US.

Key words: International trade, Dynamic networks, Blockmodeling, Russia, Iran, World-system theory, Sanctions

Апстракт: Студије засноване на теорији зависности и светског система користећи тренсне приступе показале су да је међународна трговина структурисана у кластере 'језга' и 'периферних' земаља које обављају различите функције. Међутим мало

њих је користило ове методе да би истражило како санкције утичу на положај земаља укључених у капиталистичку светску економију. Ипак ова тема је постала хитна због појаве економског сукоба као кључног геополитичког оружја 1950-их и још више у светлу превасходне улоге коју су санкције одиграле у одговору САД и њихових савезника на руско-украјински рат. Примењујући неколико техника груписања дизајнираних за сложене и временске мреже, овај рад показује помак у обрасцу трговине од земаља које санкционишу ка неутралним/пријатељским земаљама. Поред тога постоје сугестије да ове промене могу довести до стварања алтернативног „језга“ које је у интеракцији са периферијом светске економије заобилазећи традиционалне „језро“ земље као што су државе чланице ЕУ и САД.

Кључне ријечи: Међународна трговина, Динамичне мреже, Блок моделовање, Русија, Иран, теорија светског система, санкције

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1. INTRODUCTION: SANCTIONS AND ECONOMIC WARFARE IN A WORLD-SYSTEM PERSPECTIVE

This paper's research puzzle stems from the contrast between two realities. On the one hand, the impedingly uncertainty regarding economic sanctions' effectiveness and a forming awareness

of their inherent complexity (Morgan, Syropoulos, and Yotov 2023, 21ff). On the other, the dramatic increase in the speed at which states impose new sanctions since 2001 (cf. Felbermayr et al. 2020). In practice, notwithstanding over forty years of research, ‘no consensus has yet emerged on the sign and significance of the impact of the key variables that theoretically determine the success of economic sanctions.’ (Bergeijk et al. 2019, 79) Moreover, ‘there is substantial uncertainty about whether such sanctions affect economic outcomes’ (Felbermayr et al. 2020, 35). Thus, studies and commentaries on economic sanctions have failed to determine how structural factors alter sanctions’ effects.

Arguably, the incomplete understanding of sanctions stems from the underlying theoretical framework and the related methodological constraints. Hence, this paper contributes to the existing literature on international economic sanctions by addressing the issue from the perspective of world-system analysis. Arguably, dependency/world-system theory is uniquely apt to the investigation of political-economic ties amongst sovereign political units. Moreover, this approach’s relational ontology combines perfectly with network-analysis methodology. Indeed, networks have already been used to study the world-system in the last quarter of the 20th century, but not in relation to sanctions specifically. Furthermore, both fields have advanced significantly since then making previously intractable statistical analysis possible and providing words for previously unknown geoeconomic phenomena. So, the paper applies the statistical method called *stochastic blockmodeling* (SBM) to dynamic networks of world trade.

For the sake of brevity, the discussion emphasises findings relating to sanctions against the Russian Federation (RF). But the cases of Iran and, despite their shorter duration, Venezuela are also instructive and mentioned in passing. In this way, the paper answers standing interrogative regarding how international sanctions against the RF have affected the international economy’s structure since 2014, if at all.

Ultimately, the results show that sanctioned countries’ trade does not dry up, especially for commodity producers such as the abovementioned countries. Instead, it shifts from sanctioning countries towards friendlier/neutral ones. Importantly, this change seems to induce no appreciable deterioration of the target countries’ position in the world economy.

Rather, the cumulative effect of these shifts may be leading to the creation of an alternative ‘core’

that bypasses traditional ‘core’ identifiable with the ‘West’ (i.e., the US and its allies).

The paper is organised as follows. The second section provides a brief primer on the international sanctions against the RF. The third section provides basic theoretical framing within the context of world-system theory and formulates a first hypothesis.

The four section explores the existing literature on sanctions concisely, deriving four more hypothesis that operationalise the research question. The fifth section introduces the data and the methods employed in this analysis. The sixth section explores the finding in light of the five hypotheses identified previously. The last section summarises the most important findings and highlights how future researches can complement this paper’s limitations,

2. BACKGROUND

The use of sanctions became commonplace in foreign policy during the so-called ‘War on Terror’, when ‘financial warfare’ took its current shape (Zarate 2013, 44). But the most economically relevant, politically significant, and scientifically poignant slate of sanction only emerged after Crimea became part of the RF in 2014. And those were only the first skirmishes in an economic war that sent the number of new sanctions skyrocketing in 2021/2 (Morgan, Syropoulos, and Yotov 2023, 11).

Overall, the US and its allies (the ‘West’) have struck the RF with three batches of sanctions (cf. Korhonen, Simola, and Solanko 2018 for more details). First, in July 2014, the senders outlawed the trade of military and dual-use goods, cut Russian entities off the European Bank for Reconstruction and Development, and banned long-term loans to state-owned banks and financial institutions.

Then, in 2018, the sanctions struck the energy sector (Rosneft, Transneft, and Gazpromneft) and the entire military-industrial complex. Third, after Russia’s invasion of Ukraine, the US and its allies imposed unprecedented new sanctions on the RF (see Notermans 2022).¹

3. THEORETICAL FRAMEWORK

In a nutshell, world-system theory argues that, at any given point in time, capitalism structures itself as a world-system (WS). Schematically (Wallerstein 1976, 229–33), a WS is a set of cross-

¹ So much so, that the senders had to evoke a rather obscure provision of the *General Agreement on Trade and Tariffs* to justify restrictions against another WTO member (Chachko and Heath 2022).

border economic relations articulated around a value chain that involves several, distinct human groups and which is substantially independent from the external environment.

Thus, it is an economic system that constitutes a *world* in and of itself, but it is not necessarily *global*. Remarkably, the political-economic relations constitutive of the world-system are chiefly interactions amongst sovereign political entities. Finally, each actor plays a ‘role’ in these international connections that determines its ability to appropriate newly generated wealth in the WS. Namely, states are arranged into three hierarchical tiers: (i) core states (CS), which are politically functional, economically advanced, and reap most of the wealth; (ii) semi-peripheral (SP) states, which are less well off than CS, but still functional; and (iii) peripheral areas (PA), where nonexistent indigenous states (e.g., colonies, failed

states) or limited autonomy (as in neo-colonialism) together with a backward and inefficient economy manage to reap only a tiny fraction of WS’s wealth. Crucially, a country’s position in this hierarchy is relatively ‘sticky’, but not fixed. Thus, most of the 16th century’s core states remain central today.

Yet, some CS have become SP, and some SP ones fell in the PA (and, somewhat more rarely, the opposite). On the whole, these tiers should be considered as clusters around more or less well-reasoned, arbitrary boundaries along a core-periphery continuum (Hopkins and Wallerstein 1977).

Conceptually, core countries use sanctions to deter states on other tiers from asserting their interests in the WS. Formally, the theory suggests that in a WS perspective:

$$(A) \quad \text{Sanctions in a WS perspective} \\ \mathcal{H}_{a1} \text{ sanctions can worsen the target's positions in the world-system}$$

Practically, successful sanctions shift the target’s position in the WS over time by worsening its economic performance and, secondarily, inducing political instability.

4. LITERATURE REVIEW

Existing models and theories of international sanctions cannot predict with reasonable certainty that when the economic effect materialises and why sometimes it does not happen.

Partly, this is because the most common approach consists in focusing on the sanctioning state/s and the target.

And, in so doing, the literature misses on the *network effects* that sanctions can ignite.

But, as richer economies get sanctioned, the benefit that third countries derive from participating in their endeavours to prepare for, react to, and evade those measures increases.

Moreover, current methods struggle to account contemporaneously for these network effect and other WS-level processes whose relevance for international sanctions’ effectiveness this paper hypothesises:

$$(A) \quad \text{Sanctions in a WS perspective (continued)} \\ \mathcal{H}_{a2} \text{ sanctions against the RF failed because they induced a shift in trade ties} \\ (B) \quad \text{Network effects:} \\ \mathcal{H}_{b1} \text{ regional allies and non-aligned countries can derail the sanctions} \\ \mathcal{H}_{b2} \text{ decoupling both weakens sanctions and is enhanced by them} \\ (C) \quad \text{World – system implications:} \\ \mathcal{H}_c \text{ sanctions against Russia contributed to the international decoupling}$$

Remarkably, scholars from the ‘West’ argue that backfilling by potential spoilers is ineffective ‘as a political and economic strategy’ (Mau 2016, 358) due to the ‘fear of US penalties’ (Lukin 2021, 336). Yet, a chronic lack of data supporting this stance makes ignoring populous and growing countries like the People’s Republic of China (PRC) and India a rather hasty choice (Morgan, Syropoulos, and Yotov 2023, 22–23).

Moreover, most studies ignore that some countries have been sanctioned for years or decades already. Thus, they accumulated invaluable experience in countering the sustained weaponization of economic tools (Smagin 2022). And the sanctions against the RF have been giving a boost to economic decoupling. For instance, fearing a possible ban of Russian banks from foreign credit-card circuits, the Russian Central Bank began

working on MIR, an autochthonous payment system, in 2014 (Kochergin and Yangirova 2018). By 2022, MIR went from being a pre-emptive countermeasure to helping Russia circumvent sanctions. Predictably, other sanction-hit economies, as well as non-aligned countries and even some US allies have expressed interest in MIR (cf. Romanova 2022).

5. DATA AND METHODS

The adoption of network methodology in IPE and, more precisely, WS analysis began in the last quarter of the 20th century (Snyder and Kick 1979; Nemeth and Smith 1985). The reason for this combination is that network science is ‘uniquely equipped’ to grasp the political-economic networks of flows between the WS’s constituent actors as well the latter’s positions in these networks and the pattern of flows between these positions (Smith and White 1992, 858). Namely, networks allow to represent in a coherent and easily accessible way the most important traits of the WS from the point of view of IPE (Snyder and Kick 1979, 1103): (i) discrete tiers along a continuum; (ii) diachronic movement between/within tiers; (iii) patterns of interaction between tiers; (iv) Matthew effect and wealth-gap.

Formally, this is made possible by using networks to represent units (denoted as the set of vertexes $\mathcal{V} = \{v_1, v_2, \dots, v_n\}$) and the interactions amongst them (the set of ties $\mathcal{E} = \{e_1, e_2, \dots, e_m\}$). To investigate the world-system effect of international sanctions, with a focus on the RF since 2014, this paper deploys data on international trade in goods and service from the *Atlas of economic complexity* (Harvard Growth Lab [2013] 2022). The dataset provides figures for imports and exports between 1962 and 2020 ($\mathcal{T} = [1962, 2020]$) amongst a total of 249 unique countries. Then, three networks were obtained from this data using an innovative network-construction algorithm: exports (\mathbf{X}), imports (\mathbf{I}), and net exports (\mathbf{N}). First, given that trade flows vary massively in value across countries, the weight of the ties between countries (the set $\mathcal{W} = \{w_1, w_2, \dots, w_m\}$) was normalised so that the value of all imports or (net) exports from any country v_i sums to the unit ($\sum W_{v_i} = 1$). Intuitively, the sum of all weights equals the number of countries participating in international trade in that year ($\sum W_t = n_t, \forall t \in \mathcal{T}$, with $154 \leq n_t \leq 236$).

Then, in order to reduce the ‘noise’ in the network, all ties weighting less than five percent of the total flow were omitted ($(w_k < .05 \leftarrow 0) \Rightarrow W_t \in [.05, 1]$).² Each of the

resulting networks detail more than 800,000 interactions between more than 12,000 units (249 unique sovereign political entities) over 59 years.

Clearly, the staggering size of the networks under analysis makes a traditional sociometric analysis intractable. So, the paper relies on blockmodeling, a statistical technique for the simplification of large, potentially incoherent networks into smaller, intelligible structures (on blockmodeling see: Snijders and Nowicki 1997). Namely, this paper uses stochastic blockmodeling (SBM), which decomposes the network into groups of units that have similar pattern of ties called *clusters*. Notably, countries grouped in the same cluster are *stochastically equivalent* and, thus, play a similar role in the network. Practically, the analysis was ran using an approach that combines SBM ‘with independent Markov chains for the evolution of the nodes groups through time.’ (Matias and Miele 2017, 1121)³ True, this approach has some limitations (cf. Cugmas and Žíberna 2023, 18ff), and requires a constant number of cluster (see Figure 1). However, it captures both tier-switching and decoupling dynamics by allowing units to change group memberships and the connections between clusters to vary over time (Matias and Miele 2017, 1122–24). Consequently, unlike mainstream methods to study sanctions, it is well suited an holistic analysis of sanctions.

6. FINDINGS: RUSSIA’S POSITION IN THE WS THE EFFECT OF SANCTIONS

A topographic analysis of the networks shows that the RF’s position in the WS has been evolving sine the first sanctions were imposed in 2014, but not in the direction often supposed. Mainly, the RF had more ties representing less than five percent of the total trade flow than the rest of the world. Numerically, the ratio between minor and major flows,⁴ is larger than the world average for RF by 18 – 23%. Moreover, the concentration indexes of removed and present ties (plus other indicators not shown due to page limits) suggest that these averages mask a diachronic difference. Basically, the RF’s trade ties diversified faster and more than the global average since 2015, suggesting an ongoing attempt at decoupling from the core, sanctioning states. Thus this data contradicts the vulgate that the RF was unable to pivot towards other markets while under international sanctions (e.g., Mau 2016; Lukin 2021).

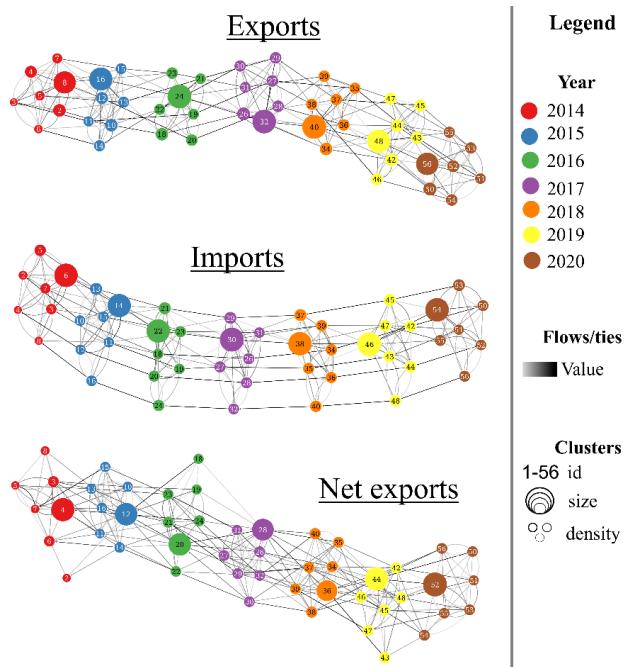
has more than 20 ties, none of which representing at least five percent of its total trade. However, this case did not materialise in this dataset.

³ This SBM is implemented in the add-on package *dynsbm* for the statistical programming language R.

⁴ Calculated as $(m - \delta)/m$, with $\delta = \text{count}(w_j < .05)$.

² This operation could potentially reduce the number of units in the network by cancelling out a country that

Figure 1. Results of the dynamic SBM on all networks (2014–2020)



Source: Author's elaboration using the Python module *graph-tool* and *Paint.net*.

Moving to the blockmodeling results, the dynamic SBM shows verifies all hypothesis by showing that (1) sanctions may worsen the targets' position and even downgrade them to a lower tier (H_{a1}); (2) but this does not always happen. Also, (3) the RF's position has not changed (H_{a2}), albeit its ties to the 'Western' CS (H_{b1}) and the SP (H_{b2}) morphed in the last decade inducing significant rearrangements in the lower tier. Overall, (4) these shifts seem to constitute the incremental steps of an ongoing global decoupling within the WS (H_c) that sees the PRC, the RF and other sanction-hit states form a parallel core and SP.

Yet, the presence of seven clusters across all time periods, for a total of 49,⁵ rather than three warrants a preliminary explanation. Essentially, the WS's tiers are a function of guesstimates regarding the exact demarking of core and (semi-)periphery along a continuum (see above; and Hopkins and Wallerstein 1977). Thus, there is an internal diversification between the tiers into lower/upper subsets of states. Moreover, the three tiers may not be geographically contiguous (Wallerstein 1976, 230). But proximity does influence international trade (cf. Anderson 2010). Hence, states tend to trade more with neighbouring countries regardless of their tier. So, more than three clusters are needed to account for economic

stratification within the tiers as well as geographical agglomeration across them.

6.1. Sanctions may affect targets' position in the WS...

Before focusing on the case of the RF, it is worth highlighting that the hypothesis that successful sanctions affect the target's position in the WS is verified by the data. For instance, most sanctions against Iran were lifted after the signing of the Joint Comprehensive Plan of Action (JCPOA). Thus, in 2012, in 2015–18, Iran came out of international isolation and sat in the mid-to-low SP cluster (id: 2, 10, 18, 26, 34) along Vietnam, Ukraine, and Serbia. However, in 2018–19, the US's withdrawal from the JCPOA marked the start of the Trump administration's 'maximum pressure' campaign (see Brewer and Nephew 2019). As a result, Iran's position in the WS worsened, with Teheran dropping into the PA since 2019 (clusters: 48, 56).

Similarly, the US-Cuba thaw during the Obama administration allowed Havana to sit in a SP cluster (id: 4, 12; spanning Latin-America and the Carribbeans) in 2014–2015. But the US's tougher stance under Trump led to tighter sanctions and Cuba's drop into the PA since 2019 (clusters: 24, 43, 40, 48, 46).

6.2. ... but it does not always happen

Still, not all sanctions seem to have the same effect and some targeted countries keep their position.

⁵ Note: The clusters in Figure 1 are labelled 1-56 and the first cluster of each time period (1, 9, 17, etc.) is homitted because some countries in the dataset do not exist anymore (e.g., Yugoslavia).

Indeed, this could be the case due to the prevalence of regional trade or a key role in markets with tight supply. The network effects due to productive complementarities amongst sanctioned states and their non-sanctioning neighbours are evident in the case of Venezuela. The country is under Western sanctions since 2017 (Buxton 2018). However, its position in the WS has remained stable as it most of its trade in sanctioned goods diverted towards non-hostile countries. So, Caracas resisted the sanctions thanks to trading scheme with neighbouring neutral states and deepening ties with India and the PRC. On a larger scale and over a longer period, the same processes applied to the RF. Practically, it remains in the cluster of European CS where it was in 2014, with France, Germany, Italy, and the Netherlands (*id: 6, 14, 22, ..., 54*). True, Moscow's global standing makes the explanation for sanctions' ineffectiveness much more complex than in Venezuela's case (see para. 6.3, below). However, both factors characterising the former case are also present here. So, the RF benefitted from continued trade with regional allies within the Eurasian Economic Union (EEU).⁶ Moreover, the data shows that trade shifted from the EU core and SP states (*id: 2, 10 18, ..., 50*) towards friendlier countries, marking an incremental decoupling. Yet, the RF's trade is much more intensely global than Venezuela's, extending beyond regional allies in the EEU to friendly BRICS countries and non-hostile ones like Egypt, Turkey, and Qatar.

6.3 The RF took advantage of re-arrangements in the semi-periphery

Intuitively, the effect of sanctions against the RF is much more relevant to the WS due to its position in the core. Essentially, the RF's pivot towards new trade partners, some of which are also geopolitical allies, brought about visible changes in the WS. Arguably, international sanctions catalysed the long-term, structural processes leading to these shifts that originated with the US's decline and the PRC's rise the only *primus inter pares* along the US (*clusters: 3, 11, 19, ..., 51*). Basically, countries tightly connected with the RF rose in the ranks of the WS as the former diverted its trade away from sanction senders. Most notably, as its cooperation with the RF intensified, Turkey has moved the mid-low SP to the cluster of European CS in 2018. Conversely, the RF's behaviour penalised Saudi Arabia, a SP commodity exporter. Arguably, the RF's discounts on hydrocarbons to friendly countries contributed to undercutting the Saudis.

⁶ Besides Russia, the EEU includes Armenia, Belarus, Kazakhstan, Kirghizstan, and Uzbekistan.

However, mere dumping from a much smaller oil producer cannot explain Riyadh's fall of grace from the Asia-Pacific cluster in 2014–16 (*id: 5, 13, 21*) down to the lower SP (*cluster: 44, 52*) in 2019–20. Rather, it seems that the RF's decoupling due to international sanctions spoiled the Saudis' somewhat awkward attempt to dance with two partners in its relations with the US, the PRC and the RF. Coherently, the data shows that, as sanctions against the RF toughened, the PRC substituted a reliable Moscow for an ambivalent Riyad. Meanwhile, the US and its allies weaponised efforts to reduce fossil-fuel use to show their dissatisfaction with Saudi Arabia's winking at strategic competitors.

6.4 From decoupling to the emergence of a parallel core and semi-periphery

Overall, the SBM shows that international sanctions on a CS can lead to more or less sudden decoupling with visible effects on SP states and the PA. Besides those mentioned above, it is worth mentioning also Egypt's temporary drop-out from the mid-to-low SP cluster into the PA in 2019 before relocating in the Latin-America SP in 2020. Interestingly, this period saw Cairo cooperating closely with the RF and distancing itself from the US somewhat. Still, many movements within SP clusters and to the PA are not directly connected to sanctions against the RF: e.g., Hong Kong following Egypt's erratic trajectory in the same years. Thus, it is necessary to contextualise the shifts associative with the reorientation of the RF's trade within the wider transformation of the WS due to the PRC's rise. After all, the PRC is the only other 'basketball ball' whose pattern of ties can dramatically change the global structure of the entire trade network. In summary, the SBM suggests that the Latin-American periphery is slowly turning into a trans-continental cluster of non-aligned SP states. Symmetrically, the mid-to-low SP cluster gather SP countries aligned or allied with the US. Meanwhile, the dualism within the *primus inter pares* cluster is mirrored in the European-CS cluster. Interestingly, models with more clusters separate this group into two distinct cores separating US-allied European CS (France, Germany, Italy, the UK, and the Netherlands) from the RF and an ambivalent Turkey. Meanwhile, SBMs with less clusters merge these clusters along geopolitical cleavages, separating the US and its allies from the PRC, the RF, and Turkey. Summarily, these results show that a parallel core-SP structure is emerging in the WS. And international sanctions against the RF are accelerating a previously slow process of incremental decoupling between US-allied and non-aligned CS and SP states.

CONCLUSION

This paper provides the first systematic account of international sanctions in a world-system perspective focusing on the case of the sanctions against the Russian Federation. Namely, it analyses the network of global trade (2014–20) with state-of-the-art stochastic blockmodeling (SBM) for dynamic networks (Matias and Miele 2017) to capture a series of *network effects* connected these sanctions. Practically, this dynamic SBM is applied on a network of exports built on high-quality data from the *Atlas of Economic complexity* (Harvard Growth Lab [2013] 2022) using an innovative network-creation algorithm. Arguably, the dynamics that detailed the sanctions against Russia can be identified also in other cases (e.g., those against Venezuela): trade with regional allies and shift to non-hostile trade partners. However, theory-building and generalisations should be left to further research. Also, subsequent researches may remedy this paper's limitation in several way. First, by using data covering the sanctions connected with the Russo-Ukrainian war and the Biden administration's sanctions against the PRC. Second, given that the dynamic SBM used for this paper does not allow for changes in the number of clusters over time, by splitting the dataset's timespan in theoretically sound time periods associated with different numbers of clusters. Third, by exploring models with more/less clusters to shed a light on the evolution of specific subsystems (e.g., the Asia-Pacific region) or highlight differences and similarities between several block models (potentially obtained with different SBM approaches). More limitedly, this paper asks how did the sanctions against Russia affect the world-system, if at all. On the basis of a thorough literature review, this question is operationalised by formulating three sets of hypotheses: (a) sanctions can worsen the target's positions in the world-system, but (a-2) sanctions against Russia did not achieve this goal; rather they induced a rearrangement of Russia's trade flow (b-1) away from sanction senders (b-2) towards non-hostile countries; and (c) sanctions against Russia contribute to the decoupling of non-aligned economies from the US-led core and SP states. Eventually, the SBM and a topographical analysis reveal that all three sets of hypotheses are verified. Most importantly, sanctions against Russia both failed because of and contributed to enhance network effects amongst (actually and potentially) sanctioned states. Overall, sanctions and the wealth-shift to Asia foreshadow a parallel core-SP structure that could sidestep US hegemony.

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SUMMARY

The existing literature on international economic sanctions has not addressed the issue from the perspective of world-system analysis. Yet, dependency/world-system theory is uniquely apt to the investigation of political-economic ties amongst sovereign political units. Moreover, this approach’s relational ontology combines perfectly with network-analysis methodology. Indeed, networks have already been used to study the world-system in the last quarter of the 20th century, but not in relation to sanctions specifically. Furthermore, both fields have advanced significantly since then making previously intractable statistical analysis possible and providing words for previously unknown geoeconomic phenomena. Against this background, this paper contributes to fill this gap by using analysing the network of global trade (2014–20) with state-of-the-art stochastic blockmodeling (SBM) from dynamic networks to capture a series of *network effects* connected with international sanctions against the Russian Federation. Practically, this dynamic SBM is applied on a network of exports built on high-quality data from the *Atlas of Economic complexity* using an innovative network-creation algorithm. The paper asks how, if at all, did the sanctions against Russia affect the world-system. On the basis of a thorough literature review, this question is operationalised by formulating three sets of hypotheses: (a) sanctions can worsen the target’s positions in the world-system, but (a-2) sanctions against Russia did not achieve this goal; rather they induced a re-arrangement of Russia’s trade flow (b-1) away from sanction senders (b-2) towards non-hostile countries; and (c) sanctions against Russia contribute to the decoupling of non-aligned economies from the US-led core and SP states. Eventually, the SBM and a topographical analysis reveal that all three sets of hypotheses are verified. Most importantly, sanctions against Russia both failed because of and contributed to enhance network effects amongst (actually and potentially) sanctioned states. Overall, sanctions and the wealth-shift to Asia foreshadow a parallel core-SP structure that could sidestep US hegemony.

COMPARATIVE ANALYSIS OF THE TRADE PERFORMANCE OF THE COUNTRIES OF THE EUROPEAN UNION, SERBIA AND BOSNIA AND HERZEGOVINA - EMPIRICAL APPROACH

КОМПАРАТИВНА АНАЛИЗА ПЕРФОРМАНСИ ТРГОВИНЕ ЗЕМАЉА ЕВРОПСКЕ УНИЈЕ, СРБИЈЕ И БОСНЕ И ХЕРЦЕГОВИНЕ – ЕМПИРИЈСКИ ПРИСТУП

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Abstract: The issue of measuring and analyzing trade performance is continuously relevant, significant and complex. It is particularly challenging to investigate trading performance using different multi-criteria decision-making methods. In this way, considering the comparison of a large number of alternatives in relation to several criteria, a more realistic knowledge of trade performance is gained in the function of improvement in the future by applying relevant measures. Based on that, this paper analyzes the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina based on the LMAW-DNMA method. According to the results of the LMAW-DNMA method, the top five countries of the European Union in terms of trade performance include: France, Germany, Spain, Poland and Italy. In terms of trade performance, the leading countries of the European Union (Germany, France and Italy) are well positioned. Malta is positioned in the last place. In terms of trade performance, Croatia is better positioned than Slovenia (21st and 23rd place, respectively). Serbia ranked twenty-second in terms of trade performance. It is positioned worse than Croatia, but it is better than Slovenia. The trade of Bosnia and Herzegovina took twenty-sixth place in terms of performance. It is worse positioned in relation to the performances of Croatia, Slovenia and Serbia. In order to

improve the trade performance of European Union countries, especially Serbia and Bosnia and Herzegovina, it is necessary to manage more efficiently the number and size of companies, human resources, employee costs, turnover and added value. The target profit can be achieved by adequate control of these and other critical factors of business success.

Key words: performance, determinants, trade of the European Union, Serbia, and Bosnia and Herzegovina, LMAW-DNMA method

Апстракт: Проблематика мерења и анализе перформанси трговине је континуирано актуелна, значајна и сложена. Изазово је посебно истраживати перформансе трговине применом различитих метода вишекритеријумског одлучивања. На тај начин се, с обзиром на компарацију већег броја алтернатива у односу на неколико критеријума, стиче реалније сазнање о перформансама трговине у функцији унапређења у будућности применом релевантних мера. Полазећи од тога, у овом раду се анализирају перформансе трговине земаља Европске уније, Србије и Босне и Херцеговине на бази LMAW-DNMA методе. Према резултатима LMAW-DNMA методе у врху пета земаља Европске уније по

перформансама трговине спадају: Француска, Немачка, Шпанија, Пољска и Италија. У погледу перформансија трговине водеће земље Европске уније (Немачка, Француска и Италија) су добро позициониране. Малата је позиционирана на последњем месту. По перформансама трговине Хрватска је боље позиционирана од Словеније (двадесет и прво и двадесет и треће место, респективно). Србија је по перформансама трговине заузела двадесет и друго место. Она је лошије позиционирана од Хрватске али је боље него Словенија. Трговина Босне и Херцеговине по перформансама је заузела двадесет и шесто место. Она је лошије позиционирана у односу на перформансе трговине Хрватске, Словеније и Србије. У циљу унапређења перформансија трговине земаља Европске уније, посебно Србије и Босне и Херцеговине неопходно је ефикасније управљати бројем и величином предузећа, људским ресурсима, трошковима запослених, прометом и додатном вредношћу. Циљни профит се може остварити адекватном контролом ових и других критичних фактора пословног успеха.

Кључне речи: перформансе, детерминанте, трговина Европске уније, Србије, и Босне и Херцеговине, LMAW-DNMA метода

JEL classification: L81, M31, M41, O32

1. INTRODUCTION

The research on the determinants of the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina is very current, significant and complex. At the same time, during the empirical analysis, different methodologies can be used. In this paper, the analysis of the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina is performed on the basis of the LMAW-DNMA method. Because, generally speaking, multi-criteria analysis methods provide a realistic assessment of the situation regarding the measurement and analysis of the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina.

There is a well-developed **literature** devoted to the issue of measuring and analyzing the performance of companies from all sectors, which means trade, using various methods of multi-criteria decision-making, including the LMAW-DNMA method. They are increasingly applied when solving complex decision-making problems, in addition to classical financial analysis (Harangi-Rákos & Fenyves, 2021; Lucas & Ramires, 2022; Baicu et al., 2022; Marques et al.,

2022; Maxim, 2021; Senapati & Yager, 2020; Senapati & Yager, 2019a; Senapati & Yager, 2019b ; Zavadskas et al., 2012; Zardari et al., 2014; Chakraborty & Zavadskas, 2014; Zavadskas, 2013a,b; Urosevic, 2017). In recent times, due to their outstanding characteristics - the accuracy of measuring the results, their application is increasing in the evaluation of trade performance and efficiency (Saaty, 2008; Ersoy, 2017; Gaur et al., 2020; Görçün et al., 2022; Lukic et al., 2020; Lukic & Hadrovic Zekovic, 2021, 2022; Lukic, 2021a,b , 2022a,b,c,d,e,f,g, 2023; Lukic et al., 2021). All relevant literature in this paper serves as a theoretical, methodological and empirical basis for researching the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina.

Research through the literature reveals that there are wide possibilities of applying multi-criteria decision-making methods in trade. In his work, Ersoy (2017) theoretically analyzes the application of various methods of multi-criteria decision-making in retail, pointing out their characteristics and significance. This paper can, in our opinion, serve as a good basis for choosing a method that will be applied in a specific case in retail and in other trade sectors. A special paper is dedicated to identifying factors that influence the effectiveness of websites in retail based on the application of the Fuzzy DEMATEL method (Gaur et al., 2020). By the way, the importance of applying different methods in the analysis of the efficiency of electronic commerce is multiple. In the literature, considerable attention has been devoted to the analysis of the efficiency and performance of global retail chains using the integrated fuzzy SWARA and fuzzy EATWOS methods (Görçün et al., 2022). A separate study analyzed the efficiency and marketing growth of retail food companies (Harangi-Rákos & Fenyves, 2021). The subject of research in the literature is the evaluation and selection of suppliers in the context of the green economy (Keshavarz-Ghorabae et al., 2020). In the literature, special attention is paid to the analysis of logistics efficiency based on the multi-criteria decision-making method (LMAW) (Pamučar et al., 2021). In a separate study, the importance of improving the procurement process for retail companies was pointed out (Maxim, 2021), and multi-criteria decision-making methods play a significant role in this. By the way, the possibilities of applying multi-criteria decision-making methods in the analysis of logistics efficiency are wide. With their help, the efficiency of individual distribution channels can be seen. Similarly, by means of multi-criteria decision-making methods, the selection of employees in retail and in supplementary activities, such as for

example tourism, can be carried out (Urosevic et al., 2017). All in all, there are wide possibilities of applying multi-criteria decision-making methods in order to improve the performance and efficiency of trading companies.

As a result, works devoted to the analysis of financial performance and trade efficiency in Serbia have been published in Serbian literature based on various multi-criteria decision-making methods (Fuzzy AHP - TOPSIS, ELECTRE, MABAC, OCRA, WASPAS, ARAS, MARCOS, TRUST) (Lukic et al. , 2020; Lukic & Hadrovic Zekovic, 2021, 2022; Lukic, 2021a,b, 2022a,b,c,d, e,f,g; Lukic et al., 2021), as well as DEA approaches (Lukic, 2022g). Multi-criteria decision-making methods were applied in the performance analysis of trading companies in Serbia for the reason that they provide more realistic results compared to classical methods of financial analysis (for example, ratio analysis), given that several criteria treated as factors are simultaneously observed. When analyzing the performance of trading companies in Serbia using different methods of multi-criteria decision-making, the following criteria were most often used: number of companies, number of employees, assets, capital sales and net profit. This is because they are a good measure of performance and correspond to the nature of the trade.

Having in mind the financial - management the importance of determining the most accurate result by applying individual or integrated methods of multi-criteria decision-making, the subject of research in this paper is a comparative analysis of the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina using the LMAW-DNMA method. The aim and purpose of this is to look at the problem as complex as possible and propose an adequate solution in order to improve the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina in the future by applying relevant measures.

The basic research **hypothesis** in this work is reflected in the fact that determining the most accurate result is a fundamental assumption for improving the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina by applying adequate measures. The **LMAW-DNMA** method plays a significant role in this.

The necessary **empirical data** for the research of the treated problem in this paper were collected from Eurostat. They are "produced" according to the unique relevant methodology and, considering that, there are no restrictions regarding the international comparison of the obtained results.

2. METHODOLOGY

In this paper, the LMAW and DNMA methods are used to measure and analyze the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina. In further presentations of the treated issues, we will point out their characteristics (Demir, 2022).

The **LMAW** method is the latest method used to calculate the weight of criteria and rank alternatives (Liao, & Wu, 2020; Demir, 2022). It takes place through the following steps : m alternatives $A = \{A_1, A_2, \dots, A_m\}$ are evaluated in comparison with n criteria $C = \{C_1, C_2, \dots, C_n\}$ with the participation of experts $E = \{E_1, E_2, \dots, E_k\}$ according to a predefined linguistic scale (Pamučar et al, 2021) .

Step 1: Determination of weight coefficients of criteria

Experts $E = \{E_1, E_2, \dots, E_k\}$ determine the priorities of the criteria $C = \{C_1, C_2, \dots, C_n\}$ in relation to the previously defined values of the linguistic scale. At the same time, they assign a higher value to the criterion of greater importance and a lower value to the criterion of less importance on the linguistic scale. By the way, the priority vector is obtained. Label γ_{cn}^e represents the value of the linguistic scale that the expert $e(1 \leq e \leq k)$ assigns to the criterion $C_t(1 \leq t \leq n)$.

Step 1.1: Defining the absolute anti-ideal point γ_{AIP}

The absolute ideal point should be less than the smallest value in the priority vector. To be calculated according to the equation:

$$\gamma_{AIP} = \frac{\gamma_{min}^e}{S}$$

where is γ_{min}^e the minimum value of the priority vector and S should be greater than the base logarithmic functions. In the case of using the Ln function , the value of S can be chosen as 3.

("Determining the weights of the criteria by the method of pairwise comparisons is based on a pairwise comparison of the criteria and the calculation of the weights using a certain prioritization method. The decision maker compares each criterion with the others and determines the level of preference for each pair of criteria. As an aid in determining the size of the preference of one criterion in relation to another an ordinal scale is used. One of the most commonly used methods is the Analytical Hierarchy Process (AHP) method. Based on pairwise comparisons of criteria - sub criteria, a pairwise comparison matrix is formed from which it is necessary to determine

the priority vector of criteria - sub criteria w (weight of criteria - sub criteria). inherent inconsistencies, the vector w is only an estimate of the real priority vector, which is unknown" (Milićević & Župac, 2012, p. 52).

Step 1.2 : Determining the relationship between the priority vector and the absolute anti-ideal point

The relationship between the priority vector and the absolute anti-ideal point is calculated using the following equation:

$$n_{cn}^e = \frac{\gamma_{cn}^e}{\gamma_{AIP}} \quad (1)$$

So the relational vector $R^e = (n_{c1}^e, n_{c2}^e, \dots, n_{cn}^e)$ is obtained.

Where it n_{cn}^e represents the value of the relational vector derived from the previous equation, and R^e represents the relational vector of $e (1 \leq e \leq k)$

Step 1.3: Determination of the vector of weight coefficients

The vector of weight coefficients $w = (w_1, w_2, \dots, w_n)^T$ is calculated by the expert $e (1 \leq e \leq k)$ using the following equation:

$$w_j^e = \frac{\log_A(n_{cn}^e)}{\log_A(\prod_{j=1}^n n_{cn}^e)}, A > 1 \quad (2)$$

where w_j^e it represents the weighting coefficients obtained according to the experts' ratings e^{th} and the elements n_{cn}^e of the real action vector R .

The obtained values for the weighting coefficients must meet the condition that $\sum_{j=1}^n w_j^e = 1$.

By applying the Bonferroni aggregator shown in the following equation, the aggregated vector of weight coefficients is determined $w = (w_1, w_2, \dots, w_n)^T$:

$$W_j = \left(\frac{1}{k \cdot (k-1)} \cdot \sum_{x=1}^k (w_j^{(x)})^p \cdot \sum_{y=1, y \neq x}^k (w_j^{(y)})^q \right)^{\frac{1}{p+q}} \quad (3)$$

The value of p and q are stabilization parameters and $p, q \geq 0$. The resulting weight coefficients should fulfill the condition that $\sum_{j=1}^n w_j = 1$.

DNMA is a new method for showing alternatives (Demir, 2022).

Two different normalized (linear and vector) techniques are used, as well as three different coupling functions (full compensation - CCM, non-compensation - UCM and incomplete compensation - ICM). The steps of applying this method are as follows (Liao & Wu, 2020; Ecer, 2020):

Step 1: Normalized decision matrix

The elements of the decision matrix are normalized with linear (\hat{x}_{ij}^{1N}) normalization using the following equation:

$$\hat{x}_{ij}^{1N} = 1 - \frac{|x_{ij} - r_j|}{\max \{ \max_i x_{ij}, r_j \} - \min \{ \min_i x_{ij}, r_j \}} \quad (4)$$

The vector (\hat{x}_{ij}^{2N}) is normalized using the following equation:

$$\hat{x}_{ij}^{2N} = 1 - \frac{|x_{ij} - r_j|}{\sqrt{\sum_{i=1}^m (x_{ij})^2 + (r_j)^2}} \quad (5)$$

The value r_j is the target value for c_j the criterion and is considered $\max_i x_{ij}$ as a useful $\min_i x_{ij}$ for cost criteria as well.

Step 2: Determining the weight of the criteria

This step consists of three phases:

Step 2.1: In this phase, the standard deviation (σ_j) for the criterion c_j is determined with the following equation where m is the number of alternatives:

$$\sigma_j = \sqrt{\frac{\sum_{i=1}^m \left(\frac{x_{ij}}{\max_i x_{ij}} - \frac{1}{m} \sum_{i=1}^m \left(\frac{x_{ij}}{\max_i x_{ij}} \right) \right)^2}{m}} \quad (6)$$

Step 2.2: Standard deviation values calculated for criteria normalize with the following equation:

$$w_j^\sigma = \frac{\sigma_j}{\sum_{i=1}^n \sigma_j} \quad (7)$$

Step 2.3: Finally, the weights are adjusted with the following equation:

$$\hat{w}_j = \frac{\sqrt{w_j^\sigma \cdot w_j}}{\sum_{i=1}^n \sqrt{w_i^\sigma \cdot w_i}} \quad (8)$$

Step 3: Calculating the aggregation model

Three aggregation functions (CCM, UCM and ICM) are calculated separately for each alternative.

The CCM (Complete Compensation Model) is calculated using the following equation:

$$u_1(a_i) = \sum_{j=1}^n \frac{\hat{w}_j \cdot \hat{x}_{ij}^{1N}}{\max_i \hat{x}_{ij}^{1N}} \quad (9)$$

The UCM (Uncompensatory Model) is calculated using the following equation:

$$u_2(a_i) = \max_j \hat{w}_j \left(\frac{1 - \hat{x}_{ij}^{1N}}{\max_i \hat{x}_{ij}^{1N}} \right) \quad (10)$$

The ICM (Incomplete Compensation Model) is calculated using the following equation:

$$u_2(a_i) = \prod_{j=1}^n \left(\frac{\hat{x}_{ij}^{2N}}{\max_i \hat{x}_{ij}^{2N}} \right)^{w_j} \quad (11)$$

Step 4: Integration of utility values

The calculated utility functions are integrated with the following equation using the Euclidean distance principle:

$$DN_i = w_1 \sqrt{\varphi \left(\frac{u_1(a_i)}{\max_i u_1(a_i)} \right)^2 + (1 - \varphi) \left(\frac{m - r_1(a_i) + 1}{m} \right)^2} - w_2 \sqrt{\varphi \left(\frac{u_2(a_i)}{\max_i u_2(a_i)} \right)^2 + (1 - \varphi) \left(\frac{r_2(a_i)}{m} \right)^2} \\ + w_3 \sqrt{\varphi \left(\frac{u_3(a_i)}{\max_i u_3(a_i)} \right)^2 + (1 - \varphi) \left(\frac{m - r_3(a_i) + 1}{m} \right)^2} \quad (12)$$

In this equation $r_1(a_i)$ and $r_3(a_i)$ represent an ordinal number of alternatives a_i sorted by CCM and ICM functions in descending value (higher value first). On the other hand, $r_2(a_i)$ it shows the sequence number in the obtained order according to the increasing value (smaller value first) for the UCM function used.

The label φ is the relative importance of the child value used and is in the range [0.1]. It is considered that it can be taken as $\varphi = 0.5$. The coefficients w_1, w_2, w_3 are obtained weights of the used functions CCM, UCM and ICM, respectively.

The sum should be equal $w_1 + w_2 + w_3 = 1$. When determining the weight, if the decision maker gives importance to a wider range of performance alternatives, he can set a higher value for w_1 . In case the decision maker is not ready to take risks, ie. to choose a poor alternative according to some criterion, he can assign a higher weight to w_2 .

However, the decision maker can assign a higher weight to w_3 also take into account overall performance and risk at the same time. Finally, the DN values are sorted in descending order, with the alternative with the higher value being the best.

3. RESULTS AND DISCUSSION

In the context of the analysis of the treated problem in this paper, by changing the LMAW-DNMA method, the following criteria were used: C1 - number of companies, C2 - number of employees, C3 - employee costs, C4 - turnover and C5 - added value.

According to Eurostat statistics, they are key performance indicators.

In addition, they correspond to the very nature of trade operations. The alternative is the countries of the European Union, Serbia and Bosnia and Herzegovina. Criteria, alternative and initial data are shown in Table 1 for 2020 (Eurostat statistics do not provide data for 2021 and 2022).

Table 1. Initial data

		Company number	Number of employees	Employee expenses – one million euros	Turnover - million euros	Added value – one million euros
		C1	C2	C3	C4	C5
A1	Belgium	144,610	646,944	26,719.00	472,683.60	53,268.50
A2	Bulgaria	138,125	498,112	3,352.40	67,379.30	7,350.60
A3	Czech Republic	224,407	720,273	10,774.20	159,941.20	19,844.70
A4	Denmark	40,496	470,203	20,572.30	187,951.80	31,628.90
A5	Germany	542,120	6,513,411	205,616.50	2,119,183.70	330,287.80
A6	Estonia	18,359	95,311	1,696.40	26,936.40	2,932.30
A7	Ireland	46,792	372,853	11,046.20	183,495.20	27,084.50
A8	Greece	221,763	747,649	8,471.10	106,976.00	12,734.20
A9	Spain	725,581	3,116,479	72,120.50	726,551.30	109,798.30
A10	France	697,283	3,565,852	139,143.70	1,331,409.70	193,620.00
A11	Croatia	35,393	238,580	3,182.70	35,379.70	5,822.60
A12	Italy	1,043,209	3,357,013	70,509.90	945,227.60	132,334.70

A13	Cyprus	16,895	72,127	1,301.50	12,673.70	2,079.20
A14	Latvia	25,272	148,270	1,753.30	28,555.40	3,110.80
A15	Lithuania	56,007	239,825	2,903.40	41,122.80	5,651.60
A16	Luxembourg	7,492	54,510	2,586.50	74,336.30	5,519.60
A17	Hungary	137,046	575,367	6,462.60	104,756.10	12,739.30
A18	Malta	8,297	36,480	594.7	8,603.80	993.6
A19	Netherlands	278,018	1,581,762	51,722.50	691,536.80	97,577.50
A20	Austria	76,938	676,322	25,727.40	249,457.70	39,101.80
A21	Poland	530,930	2,386,186	26,541.60	421,418.60	58,069.20
A22	Portugal	215,033	798,826	12,601.70	140,636.00	19,040.00
A23	Romania	174,754	889,711	8,392.90	128,164.30	19,613.70
A24	Slovenia	25,787	121,518	2,811.30	34,082.10	4,537.50
A25	Slovakia	102,841	327,772	4,270.70	58,303.80	7,558.20
A26	Finland	39,580	288,256	10,983.20	118,489.10	16,816.50
A27	Sweden	113,084	663,681	29,439.60	269,750.90	43,917.20
A28	Serbia	29,975	273,189	2,340.70	36,658.50	4,371.00
A29	Bosnia and Herzegovina	23,673	149,469	1,039.60	17,221.40	2,374.60

Source: Eurostat

Table 2 shows the descriptive statistics of the initial data.

Table 2. Descriptive statistics

Statistics						
		Company number	Number of employees	Employee expenses – one million euros	Turnover - million euros	Added value – one million euros
N	Valid	29	29	29	29	29
	Missing	0	0	0	0	0
Mean		197922.7586	1021584.5170	26368.2103	303409.7517	43785.4621
Std. Error of Mean		48317.36290	270177.58250	8485.93528	87505.96673	13293.59008
Median		102841.0000	498112.0000	8471.1000	118489.1000	16816.5000
Std. Deviation		260196.96230	1454950.80900	45698.16001	471234.05240	71588.17347
Variance		67702459170.00	2116881856000.00	2088321829.00	222061532200.00	5124866580.00
Skewness		1.928	2.469	2.890	2.643	2.839
Std. Error of Skewness		.434	.434	.434	.434	.434
Kurtosis		3.294	6.639	8.903	7.674	9.059
Std. Error of Kurtosis		.845	.845	.845	.845	.845
Range		1035717.00	6476931.00	205021.80	2110579.90	329294.20
Minimum		7492.00	36480.00	594.70	8603.80	993.60
Maximum		1043209.00	6513411.00	205616.50	2119183.70	330287.80

Note: Author's statistics

Descriptive statistics data show that: the number of companies ranges from 7492.0 (Luxembourg) to 1043209.00 (Italy), the number of employees ranges from 36480.00 (Malta) to 6513411.00 (Germany), employee expenses range from 594.70 (Malta) to 205616.50 (Germany), turnover ranges from 8603.80 (Malta), and value added ranges from 993.60 (Malta) to 330287.80 (Germany). In Serbia and Bosnia and Herzegovina, all observed statistical variables are below the average. These differences in the size of statistical variables are maintained in their own way on the performance and positioning of individual countries of the European Union, Serbia and Bosnia and Herzegovina. Table 3 shows the correlation matrix of the initial data.

Table 3. Correlations

		Correlations				
		1	3	4	5	6
1 Company number	Pearson Correlation	1	.828**	.701**	.744**	.722**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	29	29	29	29	29
2 Number of employees	Pearson Correlation	.828**	1	.953**	.965**	.967**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	29	29	29	29	29
3 Employee expenses	Pearson Correlation	.701**	.953**	1	.989**	.994**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	29	29	29	29	29
4 Turnover	Pearson Correlation	.744**	.965**	.989**	1	.998**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	29	29	29	29	29
5 Added value	Pearson Correlation	.722**	.967**	.994**	.998**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	29	29	29	29	29

**. Correlation is significant at the 0.01 level (2-tailed).

Note: Author's statistics

Data from the correlation analysis show that there is a strong correlation between the observed statistical variables, at the level of statistical significance. Table 4 shows a non-parametric test, the Friedman test.

Table 4. NPar Tests. Friedman Test

NPar Tests	
Friedman Test	
Ranks	
Company number	Mean Rank
Number of employees	3.45
Employee expenses	4.97
Turnover	1.00
Added value	3.59
	2.00
Test Statistics ^a	
N	29
Chi-Square	109.131
df	4
Asymp. Sig.	.000
a. Friedman Test	

Note: Author's statistics

The null hypothesis is rejected. There is a significant difference between the observed statistical variables (Asymp. Sig. .000). Table 5 shows the prioritization scale.

Table 5. Prioritization Scale

Prioritization Scale	Abbreviation	Prioritization
Linguistic Variables	AL	1
Absolutely Low	VL	1.5
Very Low	L	2
Low	M	2.5
Medium	E	3
Equal	MH	3.5
Medium High	H	4
High	VH	4.5
Very High	AH	5

Source: Demir, 2022

Table 6 and Graph 1 shows the evaluation of criteria by decision makers and their weighting coefficients. (In this paper, all calculations and results are the author's.)

Table 6. Evaluation and weight coefficient of criteria

Evaluation of criteria		1	1	-1	1	1
KIND		C1	C2	C3	C4	C5
E1		H	AH	H	E	MH
E2		VH	VH	MH	H	H
E3		E	MH	VH	AH	AH
E4		MH	E	E	VH	AH

YAIIP

YAIIP	0.5				
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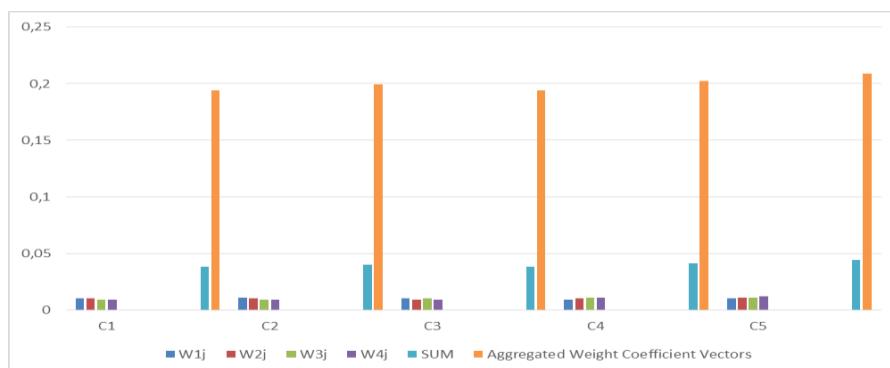
	C1	C2	C3	C4	C5	LN(Π_{ij})
R1	8	10	8	6	7	10.199
R2	9	9	7	8	8	10.499
R3	6	7	9	10	10	10.540
R4	7	6	6	9	10	10.029

Weight Coefficients Vector

Weight Coefficients Vector	C1	C2	C3	C4	C5
W1j	0.204	0.226	0.204	0.176	0.191
W2j	0.209	0.209	0.185	0.198	0.198
W3j	0.170	0.185	0.208	0.218	0.218
W4j	0.194	0.179	0.179	0.219	0.230

Aggregated Weight Coefficient Vectors

Aggregated Fuzzy Vectors	C1	C2	C3	C4	C5
W1j	0.010	0.011	0.010	0.009	0.010
W2j	0.010	0.010	0.009	0.010	0.011
W3j	0.009	0.009	0.010	0.011	0.011
W4j	0.009	0.009	0.009	0.011	0.012
SUM	0.038	0.040	0.038	0.041	0.044
Aggregated Weight Coefficient Vectors	0.1941	0.1993	0.1940	0.2026	0.2090

Graph 1. Aggregated Weight Coefficient Vectors**Source:** Author's picture

Tables 7-13 and Graph 2 show the calculations and results of applying the LMAW-DNMA method. (All calculations and results are by the authors.)

Table 7. Initial Matrix

INITIAL MATRIX	KIND	1	1	-1	1	1
	Weight	0.1941	0.1993	0.1940	0.2026	0.2090
		C1	C2	C3	C4	C5
A1	144,610	646,944	646,944	26,719.00	472,683.60	
A2	138,125	498,112	498,112	3,352.40	67,379.30	
A3	224,407	720,273	720,273	10,774.20	159,941.20	
A4	40,496	470,203	470,203	20,572.30	187,951.80	
A5	542,120	6,513,411	6,513,411	205,616.50	2,119,183.70	
A6	18,359	95,311	95,311	1,696.40	26,936.40	
A7	46,792	372,853	372,853	11,046.20	183,495.20	
A8	221,763	747,649	747,649	8,471.10	106,976.00	
A9	725,581	3,116,479	3,116,479	72,120.50	726,551.30	
A10	697,283	3,565,852	3,565,852	139,143.70	1,331,409.70	
A11	35,393	238,580	238,580	3,182.70	35,379.70	
A12	1,043,209	3,357,013	3,357,013	70,509.90	945,227.60	
A13	16,895	72,127	72,127	1,301.50	12,673.70	
A14	25,272	148,270	148,270	1,753.30	28,555.40	
A15	56,007	239,825	239,825	2,903.40	41,122.80	
A16	7,492	54,510	54,510	2,586.50	74,336.30	
A17	137,046	575,367	575,367	6,462.60	104,756.10	
A18	8,297	36,480	36,480	594.7	8,603.80	
A19	278,018	1,581,762	1,581,762	51,722.50	691,536.80	
A20	76,938	676,322	676,322	25,727.40	249,457.70	
A21	530,930	2,386,186	2,386,186	26,541.60	421,418.60	
A22	215,033	798,826	798,826	12,601.70	140,636.00	
A23	174,754	889,711	889,711	8,392.90	128,164.30	
A24	25,787	121,518	121,518	2,811.30	34,082.10	
A25	102,841	327,772	327,772	4,270.70	58,303.80	
A26	39,580	288,256	288,256	10,983.20	118,489.10	
A27	113,084	663,681	663,681	29,439.60	269,750.90	
A28	29,975	273,189	273,189	2,340.70	36,658.50	
A29	23,673	149,469	149,469	1,039.60	17,221.40	
MAX	1043209.0000	6513411.0000	6513411.0000	205616.5000	2119183.7000	
MIN	7492.0000	36480.0000	36480.0000	594.7000	8603.8000	

Table 8. Linear Normalization Matrix

Linear Normalization MATRIX		C1	C2	C3	C4	C5	MAX
	A1	0.1324	0.0943	0.9057	0.1274	0.2199	0.9057
A2	0.1261	0.0713	0.9287	0.0135	0.0278	0.9287	
A3	0.2094	0.1056	0.8944	0.0497	0.0717	0.8944	
A4	0.0319	0.0670	0.9330	0.0974	0.0850	0.9330	
A5	0.5162	1.0000	0.0000	1.0000	1.0000	1.0000	
A6	0.0105	0.0091	0.9909	0.0054	0.0087	0.9909	
A7	0.0379	0.0519	0.9481	0.0510	0.0829	0.9481	
A8	0.2069	0.1098	0.8902	0.0384	0.0466	0.8902	
A9	0.6933	0.4755	0.5245	0.3489	0.3402	0.6933	
A10	0.6660	0.5449	0.4551	0.6758	0.6267	0.6758	
A11	0.0269	0.0312	0.9688	0.0126	0.0127	0.9688	
A12	1.0000	0.5127	0.4873	0.3410	0.4438	1.0000	
A13	0.0091	0.0055	0.9945	0.0034	0.0019	0.9945	
A14	0.0172	0.0173	0.9827	0.0057	0.0095	0.9827	

	A15	0.0468	0.0314	0.9686	0.0113	0.0154	0.9686
	A16	0.0000	0.0028	0.9972	0.0097	0.0311	0.9972
	A17	0.1251	0.0832	0.9168	0.0286	0.0456	0.9168
	A18	0.0008	0.0000	1.0000	0.0000	0.0000	1.0000
	A19	0.2612	0.2386	0.7614	0.2494	0.3236	0.7614
	A20	0.0671	0.0988	0.9012	0.1226	0.1141	0.9012
	A21	0.5054	0.3628	0.6372	0.1266	0.1956	0.6372
	A22	0.2004	0.1177	0.8823	0.0586	0.0626	0.8823
	A23	0.1615	0.1317	0.8683	0.0380	0.0566	0.8683
	A24	0.0177	0.0131	0.9869	0.0108	0.0121	0.9869
	A25	0.0921	0.0450	0.9550	0.0179	0.0235	0.9550
	A26	0.0310	0.0389	0.9611	0.0507	0.0521	0.9611
	A27	0.1020	0.0968	0.9032	0.1407	0.1237	0.9032
	A28	0.0217	0.0365	0.9635	0.0085	0.0133	0.9635
	A29	0.0156	0.0174	0.9826	0.0022	0.0041	0.9826

Table 9. Vector Normalization Matrix

Vector Normalization MATRIX		C1	C2	C3	C4	C5	MAX
	A1	0.5573	0.4893	0.9355	0.4855	0.5498	0.9355
	A2	0.5541	0.4764	0.9512	0.4183	0.4390	0.9512
	A3	0.5966	0.4957	0.9277	0.4397	0.4643	0.9277
	A4	0.5060	0.4739	0.9542	0.4678	0.4720	0.9542
	A5	0.7531	1.0000	0.3155	1.0000	1.0000	1.0000
	A6	0.4951	0.4413	0.9938	0.4136	0.4280	0.9938
	A7	0.5091	0.4655	0.9645	0.4405	0.4708	0.9645
	A8	0.5953	0.4981	0.9248	0.4330	0.4499	0.9248
	A9	0.8435	0.7043	0.6745	0.6161	0.6193	0.8435
	A10	0.8296	0.7434	0.6270	0.8088	0.7846	0.8296
	A11	0.5035	0.4538	0.9786	0.4178	0.4303	0.9786
	A12	1.0000	0.7252	0.6491	0.6115	0.6790	1.0000
	A13	0.4944	0.4393	0.9962	0.4124	0.4241	0.9962
	A14	0.4985	0.4459	0.9882	0.4137	0.4284	0.9882
	A15	0.5136	0.4539	0.9785	0.4170	0.4319	0.9785
	A16	0.4897	0.4377	0.9981	0.4161	0.4409	0.9981
	A17	0.5536	0.4831	0.9431	0.4273	0.4493	0.9431
	A18	0.4901	0.4362	1.0000	0.4104	0.4230	1.0000
	A19	0.6230	0.5707	0.8367	0.5574	0.6097	0.8367
	A20	0.5240	0.4919	0.9324	0.4827	0.4888	0.9324
	A21	0.7476	0.6407	0.7517	0.4850	0.5358	0.7517
	A22	0.5920	0.5025	0.9194	0.4449	0.4591	0.9194
	A23	0.5721	0.5105	0.9098	0.4328	0.4557	0.9098
	A24	0.4988	0.4436	0.9910	0.4168	0.4299	0.9910
	A25	0.5367	0.4615	0.9692	0.4210	0.4366	0.9692
	A26	0.5055	0.4581	0.9734	0.4403	0.4530	0.9734
	A27	0.5418	0.4908	0.9337	0.4933	0.4944	0.9337
	A28	0.5008	0.4568	0.9750	0.4154	0.4306	0.9750
	A29	0.4977	0.4460	0.9881	0.4117	0.4253	0.9881
	Adj Wj	0.2062	0.1977	0.1951	0.1989	0.2021	

Table 10. CCM (Complete Compensatory Model)

CCM (Complete Compensatory Model)	u1(ai)	C1	C2	C3	C4	C5	SUM
	A1	0.0301	0.0206	0.1951	0.0280	0.0491	0.3228
	A2	0.0280	0.0152	0.1951	0.0029	0.0061	0.2472
	A3	0.0483	0.0233	0.1951	0.0110	0.0162	0.2940
	A4	0.0070	0.0142	0.1951	0.0208	0.0184	0.2555
	A5	0.1065	0.1977	0.0000	0.1989	0.2021	0.7051
	A6	0.0022	0.0018	0.1951	0.0011	0.0018	0.2019
	A7	0.0083	0.0108	0.1951	0.0107	0.0177	0.2425
	A8	0.0479	0.0244	0.1951	0.0086	0.0106	0.2866
	A9	0.2062	0.1356	0.1476	0.1001	0.0991	0.6886

	A10	0.2032	0.1595	0.1314	0.1989	0.1874	0.8804
	A11	0.0057	0.0064	0.1951	0.0026	0.0026	0.2124
	A12	0.2062	0.1014	0.0951	0.0678	0.0897	0.5602
	A13	0.0019	0.0011	0.1951	0.0007	0.0004	0.1991
	A14	0.0036	0.0035	0.1951	0.0011	0.0019	0.2053
	A15	0.0100	0.0064	0.1951	0.0023	0.0032	0.2170
	A16	0.0000	0.0006	0.1951	0.0019	0.0063	0.2039
	A17	0.0281	0.0179	0.1951	0.0062	0.0100	0.2574
	A18	0.0002	0.0000	0.1951	0.0000	0.0000	0.1952
	A19	0.0707	0.0620	0.1951	0.0651	0.0859	0.4788
	A20	0.0153	0.0217	0.1951	0.0271	0.0256	0.2847
	A21	0.1636	0.1126	0.1951	0.0395	0.0620	0.5728
	A22	0.0468	0.0264	0.1951	0.0132	0.0143	0.2958
	A23	0.0384	0.0300	0.1951	0.0087	0.0132	0.2853
	A24	0.0037	0.0026	0.1951	0.0022	0.0025	0.2061
	A25	0.0199	0.0093	0.1951	0.0037	0.0050	0.2330
	A26	0.0066	0.0080	0.1951	0.0105	0.0109	0.2312
	A27	0.0233	0.0212	0.1951	0.0310	0.0277	0.2982
	A28	0.0046	0.0075	0.1951	0.0018	0.0028	0.2118
	A29	0.0033	0.0035	0.1951	0.0004	0.0008	0.2032

Table 11. UCM (Uncompensatory Model)

UCM (Uncompensatory Model)	u2(ai)	C1	C2	C3	C4	C5	MAX
	A1	0.1761	0.1772	0.0000	0.1709	0.1530	0.1772
	A2	0.1782	0.1826	0.0000	0.1960	0.1960	0.1960
	A3	0.1579	0.1744	0.0000	0.1878	0.1859	0.1878
	A4	0.1992	0.1836	0.0000	0.1781	0.1837	0.1992
	A5	0.0998	0.0000	0.1951	0.0000	0.0000	0.1951
	A6	0.2040	0.1959	0.0000	0.1978	0.2003	0.2040
	A7	0.1980	0.1869	0.0000	0.1882	0.1844	0.1980
	A8	0.1583	0.1734	0.0000	0.1903	0.1915	0.1915
	A9	0.0000	0.0621	0.0475	0.0988	0.1029	0.1029
	A10	0.0030	0.0383	0.0637	0.0000	0.0147	0.0637
	A11	0.2005	0.1914	0.0000	0.1963	0.1994	0.2005
	A12	0.0000	0.0964	0.1000	0.1310	0.1124	0.1310
	A13	0.2043	0.1967	0.0000	0.1982	0.2017	0.2043
	A14	0.2026	0.1943	0.0000	0.1977	0.2001	0.2026
	A15	0.1963	0.1913	0.0000	0.1966	0.1989	0.1989
	A16	0.2062	0.1972	0.0000	0.1969	0.1958	0.2062
	A17	0.1781	0.1798	0.0000	0.1927	0.1920	0.1927
	A18	0.2061	0.1977	0.0000	0.1989	0.2021	0.2061
	A19	0.1355	0.1358	0.0000	0.1337	0.1162	0.1358
	A20	0.1909	0.1761	0.0000	0.1718	0.1765	0.1909
	A21	0.0427	0.0852	0.0000	0.1594	0.1400	0.1594
	A22	0.1594	0.1714	0.0000	0.1857	0.1877	0.1877
	A23	0.1679	0.1677	0.0000	0.1902	0.1889	0.1902
	A24	0.2025	0.1951	0.0000	0.1967	0.1996	0.2025
	A25	0.1863	0.1884	0.0000	0.1951	0.1971	0.1971
	A26	0.1996	0.1898	0.0000	0.1884	0.1911	0.1996
	A27	0.1829	0.1765	0.0000	0.1679	0.1744	0.1829
	A28	0.2016	0.1902	0.0000	0.1971	0.1993	0.2016
	A29	0.2029	0.1942	0.0000	0.1984	0.2012	0.2029

Table 12. ICM (Incomplete Compensatory Model)

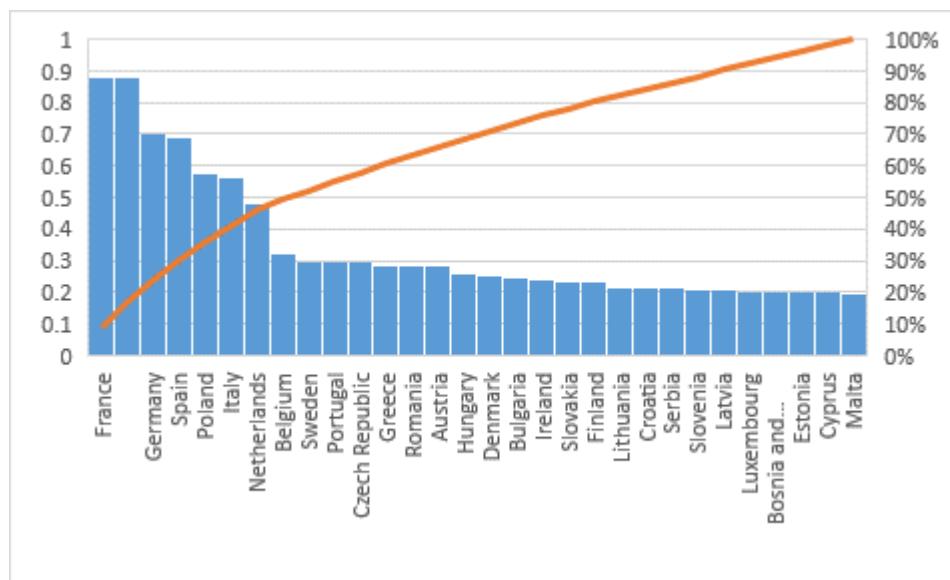
ICM (Incomplete Compensatory Model)	u3(ai)	C1	C2	C3	C4	C5	MAX
	A1	0.8987	0.8797	1.0000	0.8777	0.8982	0.6233
	A2	0.8945	0.8722	1.0000	0.8493	0.8554	0.5668
A3	0.9130	0.8834	1.0000	0.8620	0.8695	0.6045	
A4	0.8774	0.8708	1.0000	0.8679	0.8674	0.5751	
A5	0.9432	1.0000	0.7985	1.0000	1.0000	0.7531	
A6	0.8662	0.8517	1.0000	0.8400	0.8435	0.5227	
A7	0.8766	0.8658	1.0000	0.8557	0.8651	0.5618	
A8	0.9132	0.8848	1.0000	0.8599	0.8645	0.6006	
A9	1.0000	0.9650	0.9573	0.9394	0.9395	0.8153	
A10	1.0000	0.9785	0.9469	0.9950	0.9888	0.9116	
A11	0.8719	0.8590	1.0000	0.8443	0.8470	0.5356	
A12	1.0000	0.9384	0.9191	0.9068	0.9248	0.7233	
A13	0.8655	0.8505	1.0000	0.8391	0.8415	0.5198	
A14	0.8684	0.8544	1.0000	0.8410	0.8446	0.5270	
A15	0.8755	0.8591	1.0000	0.8440	0.8477	0.5381	
A16	0.8634	0.8496	1.0000	0.8403	0.8478	0.5226	
A17	0.8960	0.8761	1.0000	0.8543	0.8608	0.5773	
A18	0.8632	0.8487	1.0000	0.8377	0.8404	0.5158	
A19	0.9410	0.9271	1.0000	0.9224	0.9380	0.7549	
A20	0.8879	0.8812	1.0000	0.8773	0.8777	0.6025	
A21	0.9989	0.9689	1.0000	0.9166	0.9339	0.8284	
A22	0.9132	0.8874	1.0000	0.8656	0.8691	0.6096	
A23	0.9088	0.8920	1.0000	0.8627	0.8696	0.6081	
A24	0.8680	0.8530	1.0000	0.8418	0.8447	0.5265	
A25	0.8853	0.8635	1.0000	0.8472	0.8511	0.5512	
A26	0.8736	0.8615	1.0000	0.8540	0.8568	0.5507	
A27	0.8938	0.8806	1.0000	0.8808	0.8794	0.6097	
A28	0.8716	0.8608	1.0000	0.8440	0.8478	0.5368	
A29	0.8681	0.8545	1.0000	0.8402	0.8434	0.5256	

Table 13. Results of the LMAW-DNMA method

		Utility Values						w1	w2	w3	Rank Order		
		CCM		UCM		ICM		0.6	0.1	0.3			
		u1(ai)	Rank	0.5	u2(ai)	Rank	0.5	u3(ai)	Rank	0.5			
Belgium	A1	0.3228	7	0.6179	0.1772	6	0.6249	0.6233	7	0.7404	0.6553	0.6553	7
Bulgaria	A2	0.2472	16	0.3949	0.1960	15	0.7652	0.5668	16	0.5566	0.4804	0.4804	16
Czech Republic	A3	0.2940	10	0.5418	0.1878	9	0.6804	0.6045	11	0.6592	0.5909	0.5909	10
Denmark	A4	0.2555	15	0.4194	0.1992	19	0.8253	0.5751	15	0.5769	0.5072	0.5072	15
Germany	A5	0.7051	2	0.8871	0.1951	14	0.7510	0.7531	5	0.8443	0.8606	0.8606	2
Estonia	A6	0.2019	27	0.1779	0.2040	26	0.9441	0.5227	26	0.4170	0.3263	0.3263	27
Ireland	A7	0.2425	17	0.3721	0.1980	17	0.7954	0.5618	17	0.5389	0.4644	0.4644	17
Greece	A8	0.2866	11	0.5173	0.1915	12	0.7188	0.6006	13	0.6236	0.5694	0.5694	12
Spain	A9	0.6886	3	0.8599	0.1029	2	0.3563	0.8153	3	0.9129	0.8254	0.8254	3
France	A10	0.8804	1	1.0000	0.0637	1	0.2198	0.9116	1	1.0000	0.9220	0.9220	1
Croatia	A11	0.2124	21	0.2780	0.2005	21	0.8572	0.5356	22	0.4590	0.3902	0.3902	21
Italy	A12	0.5602	5	0.7576	0.1310	3	0.4553	0.7233	6	0.8107	0.7433	0.7433	5
Cyprus	A13	0.1991	28	0.1672	0.2043	27	0.9614	0.5198	28	0.4061	0.3183	0.3183	28
Latvia	A14	0.2053	24	0.2204	0.2026	24	0.9084	0.5270	23	0.4430	0.3560	0.3560	24
Lithuania	A15	0.2170	20	0.2997	0.1989	18	0.8109	0.5381	20	0.4834	0.4059	0.4059	20
Luxembourg	A16	0.2039	25	0.2042	0.2062	29	1.0000	0.5226	27	0.4120	0.3461	0.3461	25
Hungary	A17	0.2574	14	0.4415	0.1927	13	0.7327	0.5773	14	0.5939	0.5164	0.5164	14

Malta	A18	0.1952	29	0.1587	0.2061	28	0.9825	0.5158	29	0.4008	0.3137	0.3137	29
Netherlands	A19	0.4788	6	0.7002	0.1358	4	0.4757	0.7549	4	0.8630	0.7266	0.7266	6
Austria	A20	0.2847	13	0.4734	0.1909	11	0.7073	0.6025	12	0.6411	0.5471	0.5471	13
Poland	A21	0.5728	4	0.7833	0.1594	5	0.5599	0.8284	2	0.9376	0.8072	0.8072	4
Portugal	A22	0.2958	9	0.5645	0.1877	8	0.6726	0.6096	9	0.6970	0.6151	0.6151	9
Romania	A23	0.2853	12	0.4951	0.1902	10	0.6961	0.6081	10	0.6785	0.5702	0.5702	11
Slovenia	A24	0.2061	23	0.2378	0.2025	23	0.8926	0.5265	24	0.4338	0.3621	0.3621	23
Slovakia	A25	0.2330	18	0.3473	0.1971	16	0.7803	0.5512	18	0.5181	0.4419	0.4419	18
Finland	A26	0.2312	19	0.3262	0.1996	20	0.8403	0.5507	19	0.5044	0.4311	0.4311	19
Sweden	A27	0.2982	8	0.5875	0.1829	7	0.6501	0.6097	8	0.7151	0.6320	0.6320	8
Serbia	A28	0.2118	22	0.2588	0.2016	22	0.8749	0.5368	21	0.4707	0.3840	0.3840	22
BiH	A29	0.2032	26	0.1901	0.2029	25	0.9251	0.5256	25	0.4256	0.3342	0.3342	26
	MAX	0.8804			0.2062		0.9116						

Graph 2. Ranking



Source: Author's picture

According to the results of the LMAW-DNMA method, the top five countries of the European Union in terms of trade performance include: France, Germany, Spain, Poland and Italy. In terms of trade performance, the leading countries of the European Union (Germany, France and Italy) are well positioned. Malta is positioned in the last place.

In terms of trade performance, Croatia is better positioned than Slovenia (21st and 23rd place, respectively).

Serbia ranked twenty-second in terms of trade performance. It is positioned worse than Croatia, but it is better than Slovenia.

The trade of Bosnia and Herzegovina took twenty-sixth place in terms of performance. It is worse positioned in relation to the performances of Croatia, Slovenia and Serbia.

In order to improve the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina, it is necessary to more efficiently manage the number and size of companies, human resources, personal expenses, turnover and added value.

The performance positioning of the trade of the countries of the European Union, Serbia and Bosnia and Herzegovina was influenced by numerous macro and micro factors. These are: global political and economic climate, foreign direct investments, asset management, new business models (multichannel sales, private label, sales of organic products, etc.), new concepts of cost, sales and profit management (calculation of costs by activity, management customers, product category management, etc.), the Covid-19 pandemic, the energy crisis, etc. A key factor is the digitization of the entire business. The target profit of the trade of the countries of the European Union, Serbia and Bosnia and Herzegovina can be

achieved by effective control of critical factors (price, costs, quality, innovation and growth) of business success. The research in this paper in itself indicates the importance of applying different methods of multi-criteria decision-making (Fuzzy AHP - TOPSIS, ELECTRE, MABAC, OCRA, WASPAS, ARAS, MARCOS, TRUST, etc.) in the analysis of trade performance and efficiency. It is recommended that they, especially in an integrated manner, be increasingly used during measurement and analysis in order to improve the performance and efficiency of trade.

CONCLUSION

Based on the empirical analysis carried out in this paper, we are able to summarize the following conclusions: Descriptive statistics data show that: the number of companies ranges from 7492.0 (Luxembourg) to 1043209.00 (Italy), the number of employees ranges from 36480.00 (Malta) to 6513411.00 (Germany), employee expenses range from 594.70 (Malta) to 205616.50 (Germany), turnover ranges from 8603.80 (Malta), and value added ranges from 993.60 (Malta) to 330287.80 (Germany). In Serbia and Bosnia and Herzegovina, all observed statistical variables are below the average. These differences in the size of statistical variables are maintained in their own way on the performance and positioning of individual countries of the European Union, Serbia and Bosnia and Herzegovina. Data from the correlation analysis show that there is a strong correlation between the observed statistical variables, at the level of statistical significance. The null hypothesis is rejected. There is a significant difference between the observed statistical variables. Based on the results obtained by applying the LMAW-DNMA method in measuring and analyzing the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina, the following can be concluded: According to the results of the LMAW-DNMA method, the top five countries of the European Union in terms of trade performance include : France, Germany, Spain, Poland and Italy. In terms of trade performance, the leading countries of the European Union (Germany, France and Italy) are well positioned. Malta is positioned in the last place. In terms of trade performance, Croatia is better positioned than Slovenia (21st and 23rd place, respectively). In terms of trade performance, Serbia took twenty-second place, and is positioned worse than Croatia, but better than Slovenia. Bosnia and Herzegovina's trade in terms of performance took twenty-sixth place, and is worse positioned compared to the performance of Croatia, Slovenia and Serbia. In order to improve the trade performance of the countries of the European Union, Serbia and

Bosnia and Herzegovina, it is necessary to more effectively manage the number and size of companies, human resources, personal expenses, turnover and added value. Numerous factors influenced the performance positioning of the trade of the countries of the European Union, Serbia and Bosnia and Herzegovina. These are: global political and economic climate, foreign direct investments, asset management, new business models (multichannel sales, private label, sales of organic products , etc.), new concepts of cost, sales and profit management (calculation of costs by activity, management customers, product category management, etc.), the Covid-19 pandemic, the energy crisis, etc. A key factor is the digitization of the entire business. The target trade profit of the countries of the European Union, Serbia and Bosnia and Herzegovina can be achieved by effective control of the critical factors of business success.

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SUMMARY

Based on the empirical analysis carried out in this paper, we are able to summarize the following conclusions: Descriptive statistics data show that: the number of companies ranges from 7492.0 (Luxembourg) to 1043209.00 (Italy), the number

of employees ranges from 36480.00 (Malta) to 6513411.00 (Germany), employee expenses range from 594.70 (Malta) to 205616.50 (Germany), turnover ranges from 8603.80 (Malta), and value added ranges from 993.60 (Malta) to 330287.80 (Germany). In Serbia and Bosnia and Herzegovina, all observed statistical variables are below the average. These differences in the size of statistical variables are maintained in their own way on the performance and positioning of individual countries of the European Union, Serbia and Bosnia and Herzegovina. Data from the correlation analysis show that there is a strong correlation between the observed statistical variables, at the level of statistical significance. The null hypothesis is rejected. There is a significant difference between the observed statistical variables. Based on the results obtained by applying the LMAW-DNMA method in measuring and analyzing the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina, the following can be concluded: According to the results of the LMAW-DNMA method, the top five countries of the European Union in terms of trade performance include : France, Germany, Spain, Poland and Italy. In terms of trade performance, the leading countries of the European Union (Germany, France and Italy) are well positioned. Malata is positioned in the last place. In terms of trade performance, Croatia is better positioned than Slovenia (21st and 23rd place, respectively). In terms of trade performance, Serbia took twenty-second place, and is positioned worse than Croatia, but better than Slovenia. Bosnia and Herzegovina's trade in terms of performance took twenty-sixth place, and is worse positioned compared to the performance of Croatia, Slovenia and Serbia. In order to improve the trade performance of the countries of the European Union, Serbia and Bosnia and Herzegovina, it is necessary to more effectively manage the number and size of companies, human resources, personal expenses, turnover and added value. Numerous factors influenced the performance positioning of the trade of the countries of the European Union, Serbia and Bosnia and Herzegovina. These are: global political and economic climate, foreign direct investments, asset management, new business models (multichannel sales, private label, sales of organic products , etc.), new concepts of cost, sales and profit management (calculation of costs by activity, management customers, product category management, etc.), the Covid-19 pandemic, the energy crisis, etc. A key factor is the digitization of the entire business. The target trade profit of the countries of the European Union, Serbia and Bosnia and Herzegovina can be achieved by effective control of the critical factors of business success.

ESTIMATES OF THE EFFECTIVENESS OF MONETARY POLICY IN THE REPUBLIC OF SERBIA

ПРОЦЕНЕ ЕФИКАСНОСТИ МОНЕТАРНЕ ПОЛИТИКЕ У РЕПУБЛИЦИ СРБИЈИ

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Paper presented at the 11th International Scientific Symposium „EkonBiz: Impact of geopolitical changes on the national economy“, Bijeljina, 22 – 23th June 2023.

Abstract: Numerous empirical studies conducted in the last few years have proven that monetary policy has a significant impact on preserving the sustainability of the entire economic system of a country. Bearing in mind that the effectiveness of monetary policy in developing countries is especially questioned when the structure of the financial system limits the effectiveness of its instruments, the paper analyzes the monetary policy of the Republic of Serbia. The subject of research in this paper is the analysis and measurement of the effectiveness of monetary policy in the period from 2002-2022. In order to analyze the efficiency, a regression analysis of the determinants of monetary policy was performed. The results show that the government must pay much more attention to monetary policy in order to improve its effectiveness in the future.

Key words: monetary policy, fiscal policy, Republic of Serbia

Апстракт: Бројна емпиријска истраживања спроведена у последњих неколико година доказала су да монетарна политика има значајан утицај на очување одрживости

целокупног економског система једне земље. Имајући у виду да је ефикасност монетарне политике у земљама у развоју посебно доведена у питање када структура финансијског система ограничава ефективност његових инструмената, у раду се анализира монетарна политика Републике Србије. Предмет истраживања у овом раду је анализа и мерење ефикасности монетарне политике у периоду од 2002-2022. године. У циљу анализе ефикасности, извршена је регресиона анализа детерминанти монетарне политике. Резултати показују да влада мора посветити много више пажње монетарној политици како би побољшала њену ефикасност у будућности.

Кључне речи: монетарна политика, фискална политика, Република Србија.

JEL classification: E52, E58

1. INTRODUCTION

Bearing in mind that a large number of empirical studies have proven that monetary policy has a significant impact on the development of the

economic system of a country and the maintenance of price stability, it is necessary to pay special attention to it when conducting economic policy. The management of monetary policy explicitly implies an understanding of the role of money in economic processes.

The role of money in determining the flow of economic processes is the subject of sharp disagreement among monetarists, given that one group believes that money controls economic processes while others believe that money is a neutral factor in those processes.

"According to the views of inactive money, it is usually assumed that the amount of money is adjusted to the real needs of economic development, so that money is reduced to a passive element of the system" (Komazec & Risti, 1992). On the other hand, the idea that monetary policy instruments can influence the improvement of the economic structure is not new either. Modern economies attach great importance to monetary policy instruments.

Recognizing the complex actions of monetary policy, it is clear that a monetary policy strategy cannot produce results without a fiscal policy strategy. In other words, a partially managed monetary policy usually remains ineffective.

Therefore, the coordination of monetary and fiscal policy for the purpose of stabilization and development policy is of crucial importance for any country. However, simultaneously achieving economic stability and a high rate of economic growth is also a very complex problem.

The interaction between monetary and fiscal policy has often been modeled as a "non-cooperative game." The central bank and the government undoubtedly have their own priorities. In academia, for the last 30 years, priority has been given to fiscal policy. Fiscal policy is thought to play a more fundamental role in prices. As a result of such an attitude, the interaction between monetary and fiscal policy gained even more importance.

The subject of research is the effectiveness of monetary policy in the Republic of Serbia. The main goal of the research is to assess the impact of monetary policy on economic growth in the Republic of Serbia. Research tends to assess trends in the determinants of monetary policy, assess their impact on economic growth, and make recommendations for further research.

The current financial crisis in the Republic of Serbia has undoubtedly triggered numerous dilemmas regarding the concept of monetary policy implementation. In this regard, a large

number of researchers around the world examine the effectiveness of their concepts of applied monetary policy and the adequacy of sets of monetary instruments for conducting economic policy. The work, in accordance with the defined subject and goal of the research, starts with the following hypothesis:

H₁: Effective implementation of monetary policy has a positive effect on the economic growth and development of the Republic of Serbia.

The research is divided into four parts. In the first part of the paper, an overview of current research on the subject of this paper is given. In the second part, the effectiveness of the monetary policy in the Republic of Serbia in the last 20 years was reviewed.

The third part, based on quarterly data in the period from 2002 to 2022 and relevant statistical methods, gives the results of the research. In the conclusion of the paper, the guidelines for the creators of monetary policy were pointed out, and suggestions were given for increasing the efficiency of its instruments.

The analysis in the paper, based on the author's theoretical and empirical analysis, should produce results that can represent a contribution to the reference literature and have practical value. The research also provides recommendations to monetary policy decision-makers in order to achieve the economic development of a country.

2. LITERATURE REVIEW

The instruments of monetary policy have been the subject of debate by numerous theorists (Poole, 1970). In the 1970s, Poole pointed out that three instruments can be decisively determined through which it is possible to see the effects an

The instruments of monetary policy have been the subject of debate by numerous theorists (Poole, 1970). In the 1970s, Poole pointed out that three instruments can be decisively determined through which it is possible to see the effects and effectiveness of monetary policy.

According to this author, monetary policy should be based on the money supply and the free variation of the interest rate.

Another way of conducting monetary policy is the management of the interest rate on the money market, while the third most important instrument is the combination of the money supply and the interest rate. Explicitly, choosing the appropriate concept of monetary policy implies looking at the phase of the economic cycle in which a particular economy is located.

The level of economic development achieved greatly influences the choice of optimal instruments for conducting monetary policy. Effectiveness of monetary policy. According to this author, monetary policy should be based on the money supply and the free variation of the interest rate. Another way of conducting monetary policy is the management of the interest rate on the money market, while the third most important instrument is the combination of the money supply and the interest rate.

Explicitly, choosing the appropriate concept of monetary policy implies looking at the phase of the economic cycle in which a particular economy is located. The level of economic development achieved greatly influences the choice of optimal instruments for conducting monetary policy.

The choice of an adequate monetary policy not only affects the economic development of a country but also determines the growth of the employment rate, the productivity of the economy, and the growth of exports (Fingleton et al., 2015). Monetary policy, as an important segment of economic policy, is also the basis for solving major fiscal and other macroeconomic imbalances. Ajayi, 1974; Ali et al., 2008). On the other hand, monetary policy cannot independently achieve economic goals. Therefore, it is necessary to observe monetary policy in coordination with other economic policies, especially fiscal policy.

Crises, especially the "Great Depression" (Great World Depression, 1928–1939), indicated that monetary policy could be "ineffective." Namely, during the crisis in the USA, it was determined that monetary policy, as well as debt management, must be coordinated with fiscal policy in order to ensure the goals of high employment and the reduction of inflation.

A decade later, views on the effectiveness of monetary policy have changed, with some economists emphasizing monetary policy while another group advocates the importance of fiscal policy. In some quarters, monetary policy is viewed as more important than fiscal policy in terms of its impact on inflation and output fluctuations (Rasche & Williams, 2005).

Theorists who downplayed the importance of monetary policy started with the paradox of the role of money. Namely, there is a paradox in monetary policy that the main goal of central banks, price stability, is getting less and less attention from these institutions.

In recent years, monetary policy has continued to evolve in light of the economic and political environment. Most attention was paid to the

ultimate goal of monetary policy, but also to the question, "Should price stability be the only goal of monetary policy?" (Borio, 1997).

There are many studies on the impact of monetary policy on the economic development of a particular country (Chowdhury, 1986; Enache, 2009).

A positive impact on economic growth has been confirmed (Ajisafe & Folorunso, 2002; Okoro, 2013). The effect of monetary variables such as the interest rate, inflation rate, and monetary aggregates M1, M2, and M3 was especially emphasized. Okoro (Okoro, 2013) investigates the effects of monetary policy on economic growth in Nigeria from 1970 to 2010.

The research results indicate a negative correlation between the gross domestic product and the inflation rate, while a positive effect of the money supply on economic growth was identified. Recent research (Wu et al., 2022) emphasizes the importance of fiscal and monetary policy coordination, indicating that the coordination of these two policies has the potential to boost market confidence and is the foundation for structural changes in the medium and long term. Once there is a breakdown in the coordination of these policies, it leads to negative effects on economic growth and negative effects on debt growth. Additionally, an expansive monetary policy can lead to inflation (Kvrgi et al., 2011).

A large number of studies emphasize the impact of monetary policy on incomes, employment rates, asset prices, and interest rates (McKay & Wolf, 2023).

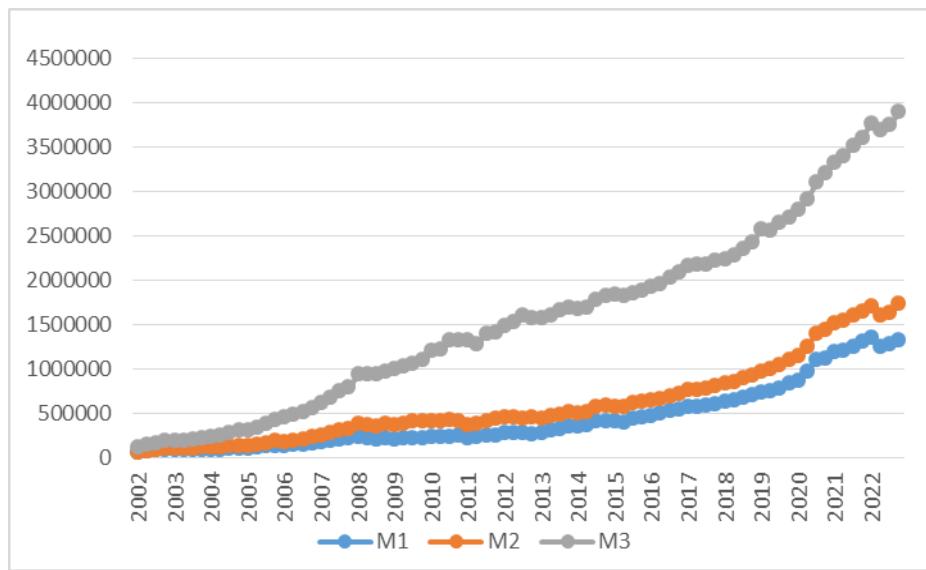
3. EMPIRICAL OBSERVATIONS OF MONETARY POLICY IN THE REPUBLIC OF SERBIA

The main goal of the National Bank of Serbia is to achieve and maintain price stability, thereby achieving the stability of the entire financial system and the sustainability of its economy. In the inflation targeting regime, the reference interest rate is the main instrument of monetary policy.

Aggregates of the money supply are adapted to the economic development of the Republic of Serbia.

Money supply M1 includes ready money in circulation and funds on giro, current, and other accounts of the owner. Money supply M2, in addition to M1, includes other dinar deposits, both short-term and long-term. Money supply M3, in addition to M2, includes short-term and long-term foreign currency deposits.

Graph 1. Movement of basic monetary aggregates in the Republic of Serbia (in millions of dinars), 2002–2022.



Source: Authors based on data from the National Bank of Serbia

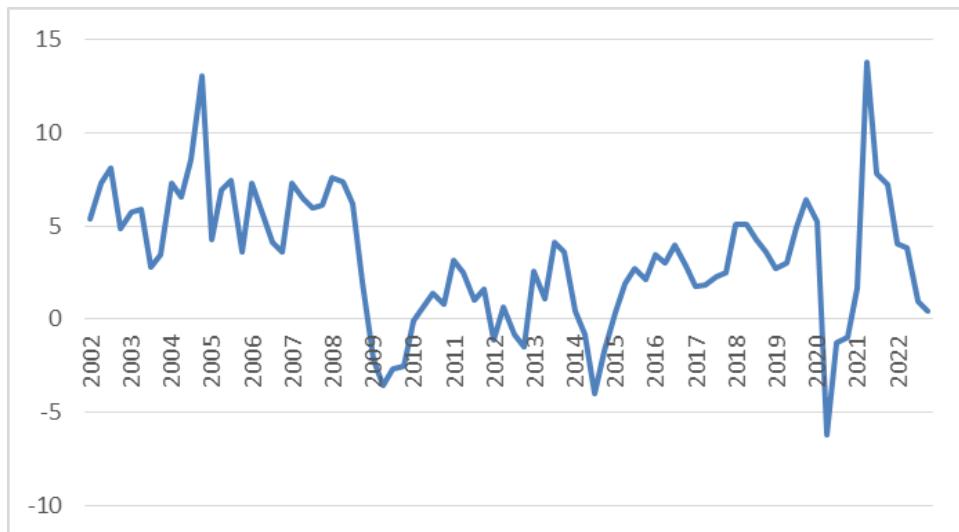
The graph shows the increase in money supply in the Republic of Serbia in the period from 2002 to 2023.

The dynamics of growth were uneven and jumpy in certain periods. In certain years (2009, 2021), a decrease in the money supply is recorded, which is a consequence of the crises that occurred before that period. Credit expansion and a high level of

public spending can be cited as additional causes of fluctuations in the money supply.

If we compare the movement of the gross domestic product in the observed years with the dynamics of the money supply in the same period, then we will unequivocally determine the existence of a difference, because the growth rate of the money supply is higher compared to the growth rate of the gross domestic product.

Graph 2. Trends in gross domestic product in the Republic of Serbia (in%), 2002–2012



Source: Authors based on data from the Republic Statistical Office of Serbia

Based on Graph 1 and Graph 2, we can conclude that the movement of the money supply was not in all years coordinated with the growth rate of the gross domestic product, which means that the

movement of the money supply took place according to the needs and requirements of real economic categories.

4. EFFECTS OF MONETARY POLICY ON ECONOMIC GROWTH AND DEVELOPMENT IN THE REPUBLIC OF SERBIA: RESULTS OF EMPIRICAL ANALYSIS

Using SPSS Statistics 26 data processing software, an econometric analysis of the generated empirical data of the study was conducted. The data were collected from the websites of the National Bank of Serbia and the Republic Institute of Statistics. The estimated database includes quarterly data for the period 2002–2022. In order to examine the influence of monetary determinants on the

economic growth of the Republic of Serbia (GDP), a correlation and then a regression analysis were conducted. The following determinants of the monetary policy of the Republic of Serbia were analyzed:

	<i>Variable</i>	<i>Description</i>
<i>M1</i>		Narrow money
<i>M2</i>		Broad money (M2)
<i>M3</i>		Broad money (M3)
<i>R</i>		Reference interest rate
		The results of the correlation analysis are shown in Table 1.

Table 1. Results of the correlation analysis of determinants of monetary policy and gross domestic product

		<i>lnBDP</i>	<i>lnM1</i>	<i>lnM2</i>	<i>lnM3</i>	<i>R</i>
<i>lnM1</i>	R	1	.925**	.946**	.932**	-.725**
	sig		.000	.000	.000	.000
	N	108	84	84	84	65
<i>lnM2</i>	R	.925**	1	.989**	.952**	-.897**
	sig	.000		.000	.000	.000
	N	84	84	84	84	65
<i>lnM3</i>	R	.946**	.989**	1	.982**	-.875**
	sig	.000	.000		.000	.000
	N	84	84	84	84	65
<i>R</i>	R	.932**	.952**	.982**	1	-.859**
	sig	.000	.000	.000		.000
	N	84	84	84	84	65
	R	-.725**	-.897**	-.875**	-.859**	1
	sig	.000	.000	.000	.000	
	N	65	65	65	65	65

Note: *ln* is the natural logarithm

Source: Authors

The results of Prison's correlation coefficient indicate the strength of the relationship between the determinants of monetary policy and gross domestic product. Bearing in mind that the correlation analysis is based on the determination of the correlation coefficient *r*, which ranges from -1 to +1, we can conclude that there is a high level

of correlation between the analyzed monetary determinants and gross domestic product. Based on the results of the correlation analysis, it can be concluded that the greatest degree of agreement exists between quasi-money (*M2*) and gross domestic product (GDP). The results of the regression analysis are shown in Table 2.

Table 2. Results of regression analysis

	Unstandardized Coefficients		Beta	t	Sig.	R2	F	sig
	B	Std. Err.						
(Constant)	11.544	0.105	0.000	109.988	0.000	.856	488.278	.000
<i>lnM1</i>	0.183	0.008	0.925	22.097	0.000			
(Constant)	11.421	0.093	0.000	123.260	0.000	.894	694.546	.000
<i>lnM2</i>	0.188	0.007	0.946	26.354	0.000			
(Constant)	11.507	0.101	0.000	114.076	0.000	.869	545.289	.000
<i>lnM3</i>	0.169	0.007	0.932	23.351	0.000			
(Constant)	14.035	0.016	0.000	870.114	0.000	.526	69.859	.000
R	-0.015	0.002	-0.725	-8.358	0.000			

Source: Authors

The results of the regression analysis show a significant influence of monetary determinants on the gross domestic product. Each of the determinants of monetary policy describes a high percentage of the variance of the dependent variable (over 85%, except for the reference interest rate, 52.6%).

In the second step of assessing the influence of the analyzed monetary determinants, an additional regression analysis was conducted. Due to the presence of correlation between determinants, a stepwise optimization algorithm was used to obtain a multivariate model.

Table 3. Results of regression analysis 2

Unstandardized Coefficients		Standardized Coefficients		t	Sig.		
B	Std. Error	Beta			R2	F	sig
(Constant)	11.733	0.151	0.000	77.866	0.000	.770	211.179 .000b
lnM2	0.164	0.011	0.878	14.532	0.000		

Source: Authors

In the first regression analysis model, all determinants of monetary policy were included. After optimization, only one quasi-money variable (M2) remained in the predictive model as the most important factor, while M1, M3, and R were excluded from the model as predictors that do not have sufficiently good individual predictive potential. It can be concluded that the monetary policy of the Republic of Serbia had a positive effect on economic development in the analyzed period. Therefore, we can conclude that the implemented monetary policy in the analyzed period had a significant impact on preserving the sustainability of the economic system of the Republic of Serbia. Given that monetary policy is implemented at the level of the National Bank of the Republic of Serbia, it must be emphasized that fiscal policy is also responsible for achieving the goals of monetary policy. Namely, it is impossible to effectively implement monetary policy without other management policies, such as fiscal policy. The coordination of monetary policy and fiscal policy should therefore be one of the important goals of the economic policy of the Republic of Serbia in the future as well (Orevi et al., 2020).

CONCLUSION

It can be concluded that the implemented monetary policy, in coordination with other economic policies, can influence the achievement of the economic development of the Republic of Serbia. The starting hypothesis in the research that the effective implementation of monetary policy has a positive effect on the economic growth and development of the Republic of Serbia has been confirmed.

Given that one of the key goals of macroeconomic policy, especially in developing countries, is the

achievement and preservation of economic stability in order to achieve economic growth, it is necessary for monetary policy instruments to be effective. The paper examines the effects of monetary policy on the economic growth and development of the Republic of Serbia and the manner in which monetary policy was conducted in the period from 2002 to 2022.

Monetary policy in the conditions of the crisis caused by the COVID-19 pandemic had the difficult task of influencing the mitigation of the consequences of the crisis with an adequate monetary policy. Thus, the movement of the gross domestic product in this period was uneven in relation to the movement of the money supply. However, monetary policy played a key role in stabilizing the economy with its measures. The National Bank of Serbia has undertaken numerous monetary measures to overcome the economic crisis caused by the COVID-19 pandemic, and the reduction of the reference interest rate was one of those measures. The growth of the money supply and the increase in the inflation rate were expected as the accompanying consequences of the measures taken by the National Bank of Serbia, given that the increased liquidity injected into the economy could not be fully absorbed and transmitted in the form of an increase in the gross domestic product but partially resulted in price growth. However, the current increase in inflation, which is largely the result of monetary measures, will not have negative consequences on the economy to the extent that there would have been a significant reduction in the gross domestic product if the measures of the National Bank of Serbia had not been applied.

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SUMMARY

There is a deep schism among monetarists as to whether or not money regulates economic processes, or whether or not it is a neutral factor in influencing the flow of economic processes.

The success of Serbia's monetary policy is the focus of this study. The study's primary objective is to evaluate how monetary policy has affected economic expansion in Serbia. Trends in the determinants of monetary policy, their effects on economic growth, and suggestions for future study are common foci of academic inquiry. The theoretical and empirical analysis presented in the paper should yield results that add to the existing body of knowledge and are useful in some way. The study also includes suggestions on how monetary policy might help advance economic growth in a country.

Money supply in the Republic of Serbia rises between 2002 and 2023 according to an examination of monetary policy factors. The dynamics of growth were erratic and choppy at times. As a result of the crises that occurred prior to those years, the money supply drops in specific years (2009, 2021). Changes in the money supply can also be attributed to factors like credit expansion and heavy government spending. The significance of the factors influencing monetary policy and GDP is revealed by the values of Prison's correlation coefficient. The examination of correlations shows that quasi-money (M2) and GDP have the highest level of concordance. We can draw the conclusion that the Republic of Serbia's economic development may be affected by the monetary policy in place, provided it is coordinated with other economic policies. The study's findings corroborate the study's null hypothesis, which posited that well-executed monetary policy would boost the economy of the Republic of Serbia.

IMPACT OF GLOBAL MOVEMENTS ON ECONOMIC GROWTH AND FISCAL STABILITY IN THE REPUBLIC OF SRPSKA

УТИЦАЈ ГЛОБАЛНИХ КРЕТАЊА НА ЕКОНОМСКИ РАСТ И ФИСКАЛНУ СТАБИЛНОСТ У РЕПУБЛИЦИ СРПСКОЈ

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Paper presented at the 11th International Scientific Symposium „EkonBiz: Impact of geopolitical changes on the national economy“, Bijeljina, 22 – 23th June 2023.

Abstract: The world economy has been exposed to intense cyclical movements since the beginning of the 21st century. After the global economic crisis of 2008, several years of stabilization and recovery followed. The last few years have seen global disruptions caused by various factors, such as: the migrant crisis, the crisis caused by the COVID-19 pandemic and the current crisis in Ukraine. This resulted in a disruption in the energy market, global inflation, disrupted supply chains and the growth of protectionism in international trade, with a strong impact on economic developments in the Republic of Srpska. Republika Srpska, as a small and open economy at a lower level of development, is highly exposed to movements on the global market, and especially to oscillations of economic activity in countries with which it has intensive economic relations. Exports in Republika Srpska are highly correlated with its economic growth and efficient use of available resources. But Republika Srpska is import dependent in many sectors. Monetary policy is based on the principle of the monetary board, and the economic development of Republika Srpska is directly conditioned by foreign direct investments.

These facts are conditioned by the economic trends in the Republic of Srpska. The question is to what extent global disturbances affect economic developments in the Republic of Srpska and how these developments affect its fiscal stability? This paper provides a quantification of the impact of the economic trends of the most important foreign trade partners of Republika Srpska and the countries of the European Union on its economic growth. This analysis quantifies the impact of the economic development of Republika Srpska on fiscal stability. Based on the results of this analysis, the information is obtained as to show how dependent the economy of Republika Srpska is on external influences, and how fiscal stability is conditioned by its economic development.

Key words: GDP, economic growth, fiscal stability and economic crisis.

Апстракт: Свјетска економија је од почетка XXI вијека изложена интензивним цикличним кретањима. Након свјетске економске кризе 2008. године усlijедило је неколико година стабилизације и опоравка. Међутим,

последњих неколико година наступају глобални поремећаји изазвани различитим факторима, као што су: мигрантска криза, криза изазвана пандемијом КОВИД-19 и актуелна криза у Украјини. Претходно наведено имало је за посљедицу поремећај на тржишту енергетичког индустријског сектора, глобалну инфлацију, поремећене ланце снабдевања и раст протекционизма у међународној трговини, са снажним утицајем на економска дешавања у Републици Српској. Република Српска као мала и отворена економија на нижем нивоу развоја високо је изложена кретањима на глобалном тржишту, а нарочито осцилацијама економске активности у земљама са којима има интензивне економске односе. Извоз Републике Српске је високо корелисан са њеним економским растом и ефикасним коришћењем расположивих ресурса. Република Српска је увоздно зависна у многим секторима. Монетарна политика функционише на принципу монетарног одбора уз фиксни курс конвертибилне марке који је везан за евру као резервну валуту, а економски развој Републике Српске је директно условљен страним директним инвестицијама. Наведене чињенице условљавају економска кретања у Републици Српској. На основу тога, поставља се питање у којој мјери глобални поремећаји утичу на економска кретања у Републици Српској и на који начин таква кретања утичу на њену фискалну стабилност? Овај рад даје квантификацију утицаја економских кретања најважнијих спољнотрговинских партнера Републике Српске и земаља Европске уније на њен економски раст. Осим тога, анализа квантификује и утицај економског кретања Републике Српске на фискалну стабилност. Резултати показују колико је економија Републике Српске зависна од спољних утицаја, а колико је фискална стабилност условљена њеним економским развојем.

Кључне речи: БДП, економски раст, фискална стабилност и економска криза

JEL classification: E62, E66, F43, F44, F63, H62, H63

1. INTRODUCTION

Unstable economic conditions caused by multiple factors have influenced the reduction of economic growth in the developed countries of the world. Countries with a low level of development had much stronger negative effects, but especially those countries whose fiscal stability and economic growth is conditioned by the growth of other countries. This especially applies to small

open economies such as Republika Srpska. There is a lot of research on the connection between openness and growth. Many authors argue that there is a positive relationship between openness and growth. The countries that reduced tariffs the most in the process of globalization achieved the highest growth rates per inhabitant. (Dollar and Kraay, 2001). This is confirmed by OECD reports (1998), which state that more open economies always outperform countries with protectionist trade policies and restrictions on capital movements. However, there are also authors who challenge these claims, that is, question them due to the circumstances prevailing on the world market. Free trade and openness of the economy can reduce current income and even growth if there are market disturbances (Srinivasan and Bhagwati, 1999). In the conditions of global disturbances, openness brings many opportunities, but also threats. In such conditions, the reason for the unsustainability of economic growth lies precisely in the external shocks that come with the openness of the economy. Numerous analyzes were made about the negative impacts on the economic growth of the economy, which are conditioned by external influence, during the crisis caused by the corona virus. Slower growth and recession during the corona crisis in the Eurozone, the largest export market of Republika Srpska, contributed to a drop in exports and a decrease in industrial production. The effects of the world crisis on the small and open economy of Republika Srpska affected almost all sectors of the economy. The decrease in activities in the field of tourism and related activities, transport, trade, construction and other activities sharply reduced private consumption and investments, which led to a drop in GDP, because private consumption is still the main driver of the economy in Bosnia and Herzegovina (World Bank , 2020, p.). Analyzes show that new global flows are largely the result of changes in the political and economic power of individual countries, their economic structure and the structure of their foreign trade (Krajišnik, Gojković, 2021, p. 196.). The economy of Republika Srpska is under the influence of changes in the world market, that is, changes in the economy of its main foreign trade partners (Gojković, 2021, p. 1). Therefore, the results of the analysis show a significant decline, both in the global economy and, consequently, in the developing economy. For three years now, the largest number of countries in the world have been facing a large-scale crisis. For the current problems of inflation, broken supply chains and generally low economic growth, the most important thing is to define the problem. More precisely, it is necessary to quantify what it is that mostly threatens the economic growth of a particular

country and affects its fiscal stability. The importance of foreign trade for the functioning and development of every country in the world is unquestionable. But the level of that importance is not the same for different countries. It depends on the size of the country, i.e. its market, the variety and volume of resources available to the country, the level of economic development, the economic structure, as well as the economic policy implemented by the country, and trends in the world market (Krajišnik, Gojković, Josipović, Popović, 2020). Economic growth and development in a country is conditioned by various factors. Depending on the level of development, economic structure and size of the country, the stated degree of conditionality will also depend. In the Republika Srpska, it is evident that its economic growth is heavily dependent on external factors. Because the Republika Srpska is a small and open economy, it is necessary to quantify the influence of external factors on its economic growth. For stable public finances and fiscal stability, it is necessary to ensure the balancing of public finances and a sustainable level of public debt (Gojković, 2021, p. 98.). Therefore, it is necessary to provide an adequate selection of measures for overcoming economic oscillations by quantifying external influences. Based on the analysis of the connection, fiscal stability and GDP growth rate, it is evident that countries with a lower level of development, measured by GDP per capita, have a greater need for stable public finances (Gojković, 2021, p. 110).

2. AIM AND METHOD OF RESEARCH

The following research analyzes the impact of the economic trends of the most important foreign

trade partners of Republika Srpska and the countries of the European Union on its economic growth. In addition, the focus is on the analysis of the impact of the economic growth of Republika Srpska on fiscal stability. Based on the above, it will be clear how dependent the economy of Republika Srpska is on external influences, and how much the primary balance is affected by its economic growth.

The statistical basis for the research is data from the IMF and data from the Ministry of Finance of the Republic of Srpska for the period from 2015-2022.

The first part of the paper analyzes the impact of the economic development of the main foreign trade partners of the Republic of Srpska (Serbia, Italy, Germany, Croatia, Slovenia, Austria, China, Hungary, Turkey and Poland) on the economic growth of the Republic of Srpska, measured through the height of the real GDP growth rate. In the second part of the paper, the impact of the economic growth of the European Union countries on the economic growth of the Republic of Srpska is analyzed in the same way.

In the third part of the research, the impact of real GDP growth on the fiscal stability of Republika Srpska is analyzed using the primary budget balance.

In this way, the level of influence of economic oscillations in the mentioned group of countries on the economic growth of the Republic of Srpska will be quantified.

The following table shows the basis of the data that will be used for the analysis in the statistical software Eviews 9

Table 1. Overview of data used for analysis in the statistical model

Year	GDP of the main foreign trade partners of the RS	Real growth rates			Primary balance as % RS GDP
		GDP EU	GDP RS		
2015	3,1	2,5	2,8	-0,7	
2016	3,1	2	3,5	-1,2	
2017	4,08	3	3,1	1,1	
2018	3,72	2,3	3,9	-0,6	
2019	3,04	2	2,5	-0,3	
2020	-3,54	-5,6	-2,5	-5,7	
2021	7,67	5,6	6,9	-0,8	
2022	4,29	3,7	3,5	3,3	

Source: Data from the IMF, the Republic Institute for Statistics of the Republic of Srpska and the Consolidated Report on the execution of the budget of the Republic of Srpska.

The establishment of mutual connections between two or more observed phenomena is the subject of regression and correlation analysis that will be used in this research as well. Using the regression equation, it will be possible to express the average and regular relationship of observed phenomena. Also, it is possible to express the degree and direction of their connection, if of course it exists. If we observe only two phenomena, then the analysis is reduced to a simple regression and correlation analysis (Komić, 2000), which will be used to draw conclusions. The relationship between the relative value of the change in the GDP of the Republic of Srpska with the relative value of the change in the GDP of the main foreign trade partners of the Republic of Srpska (MFTP RS) and the GDP of the countries of the European Union (EU) will be determined individually with the help of linear regression analysis. In this way, the relative influence of the GDP of Republika Srpska on its fiscal stability measured through the primary balance (PB) will be determined. In accordance with the previously mentioned GDP MFTP RS and EU GDP represent the explanatory variable, while RS GDP is the dependent variable in this part. In the third part of the research on the influence of economic activity in the Republika Srpska on its fiscal stability, the RS GDP represents the explanatory variable, and the primary balance represents the dependent variable.

$$Y = f(GDP \text{ MFTP RS}, GDP \text{ EU}, X) \quad (1)$$

$$Y = f(GDP \text{ RS}, X) \quad (1)$$

To establish the average law-metric relationship between two observed phenomena, it is necessary to determine the parameters of a simple linear regression, which can be represented as follows:

$$Y_i = \beta_0 + \beta_1 x_i + \varepsilon_i \quad i = 1, 2, \dots, N \quad (2)$$

- Y_i : i- dependent variable, GDP RS and PB RS;
- x_i : i- independent variable, GDP RS, GDP EU and GDP RS;
- β_0 and β_1 - unknown constants - regression parameters;
- ε_i - stochastic term or statistical error;
- N – The size of the basic set.

Considering that the above analysis will be done on the sample, and not on the basic set, the estimated simple linear regression function will be used, based on the sample defined as:

$$\hat{Y}_i = b_0 + b_1 x_i \quad (3)$$

In the relationship marked with \hat{Y}_i is the value of the dependent variable that is exactly on the best-fit regression line, and b_0 i b_1 are the ratings of the regression parameters of the basic set.

Estimates of the parameters in the regression equation are obtained based on the method of least squares, which assumes the minimization of the square of the vertical linear deviations of the original data from the regression line. In this way, a system of original data is obtained from the regression line (Lovrić et al. 2006), and the solution of the mentioned system of equations enables the direct calculation of the values of the parameters in the regression equation:

$$b_1 = \frac{n \sum xy - \sum x \sum y}{n \sum x^2 - (\sum x)^2} \quad (4)$$

$$b_0 = \bar{y} - b_1 \bar{x}. \quad (5)$$

The parameter b_0 the expected value of the dependent variable Y, if the independent variable X has a value of 0, while the parameter b_1 shows the average change of the dependent variable, with a unit increase of the independently applicable.

For this type of analysis, applying the method of least squares, the econometric program Eviews 9 was used. This method is simple and reliable since it mutually excludes positive and negative errors. In addition, this analysis includes the standard deviation, mean, maximum and minimum values, skewness of the distribution, and a measure of the tendency of the serial distribution. The results of the regression analysis give an estimate of the significance of the following variables: probability (p), t-statistics, standard error of estimation and coefficient of determination r^2 .

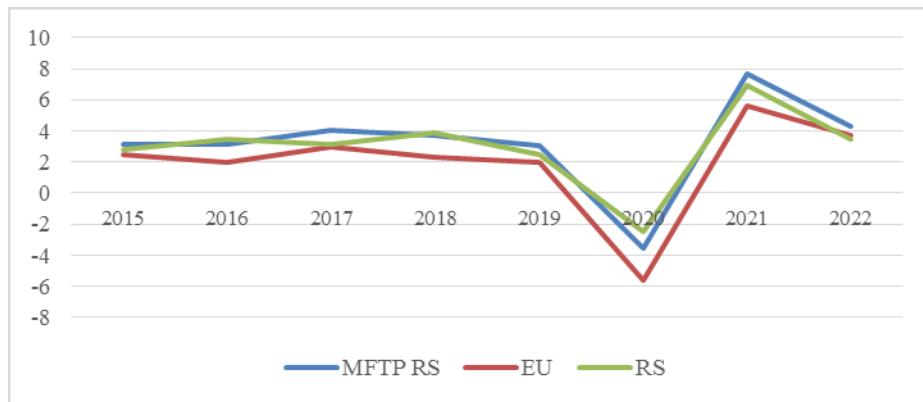
3. ANALYSIS OF THE IMPACT OF GLOBAL TRENDS ON ECONOMIC GROWTH AND FISCAL STABILITY IN THE REPUBLIC OF SRPSKA

The impact of global trends on the economic growth of small economies like Republika Srpska is unquestionable. But, in order to further overcome the problems caused by global movements, it is necessary to measure the level of the same. According to the trend lines of the realization of GDP in the following graph, it will

be assumed that economic growth and the provision of fiscal stability in Republika Srpska are mostly influenced by economic trends on

which Republika Srpska has no direct influence. The basis for the aforementioned assumptions can also be found in the trend lines on the next chart.

Chart 1. Trend of GDP realization in MFTP RS, EU and RS from 2015-2022. years



Source: Data from the IMF and the Republic Institute for Statistics of the Republic of Srpska

To determine the level of influence, a regression analysis was performed through influence:

1. Economic trends of the most important foreign trade partners of the Republic of Srpska on its economic growth,
2. The economic trends of the European Union on the economic growth of the Republic of Srpska and
3. The economic development of the Republic of Srpska on its fiscal stability

3.1. Analysis of the impact of the economic trends of the main foreign trade partners of the Republic of Srpska on its economic growth

During the observed period, the impact of the crisis was evident, which was reflected at the very

beginning of 2020 due to rapidly growing inflation and the sudden interruption of supply chains. Then there is a negative growth rate for almost all foreign trade partners of Republika Srpska. So, for example In Austria, from a positive growth rate of 1.5% in 2019, a negative growth rate of -6.5% is evident in 2020. In the same year, the biggest decline was evident in Italy and Croatia.

However, the only two countries that did not have a negative rate of economic activity are China and Turkey, but Republika Srpska does not achieve a high level of foreign trade with these two countries.

The following table shows the real % of GDP growth of the main foreign trade partners of the Republic of Srpska (MFTP RS).

Table 2. Real % GDP growth, MFTP RS

Real % of GDP growth main foreign trade partners of the RS	2015	2016	2017	2018	2019	2020	2021	2022
Serbia	1,8	3,3	2,1	4,5	4,3	-0,9	7,5	2,3
Italy	0,8	1,3	1,7	0,9	0,5	-9	7	3,7
Germany	1,5	2,2	2,7	1	1,1	-3,7	2,6	1,8
Croatia	2,5	3,6	3,4	2,8	3,4	-8,6	13,1	6,3
Alovenia	2,2	3,2	4,8	4,5	3,5	-4,3	8,2	5,4
Austria	1	2	2,3	2,4	1,5	-6,5	4,6	5
China	7	6,9	6,9	6,8	6	2,2	8,4	3
Hungary	3,7	2,2	4,3	5,4	4,9	-4,5	7,1	4,9
Turkey	6,1	3,3	7,5	3	0,8	1,9	11,4	5,6
Poland	4,4	3	5,1	5,9	4,4	-2	6,8	4,9

Source: IMF data, May 20223

The impact of the Covid-19 crisis and the sharp decline in economic activity can also be seen in the following graph, where the average GDP growth

rate of the main foreign trade partners of the Republic of Srpska from 2015-2022 is given.

Chart 2. Average GDP growth rate of MFTP RS from 2015-2022. years



Source: IMF data, May 2023 and author's calculation.

In the following analysis, it can be seen to what extent the aforementioned trend had an impact on the level of GDP in the Republic of Srpska.

The regression analysis of the main foreign trade partners of the Republic of Srpska and the impact on the GDP of the Republic of Srpska shows that

there is an evident correlation between the realization of the GDP of MFTP RS and the realization of the GDP of the Republic of Srpska, since the correlation coefficient is $r=0.986$.

Table 3. Regression analysis of GDP MFTP RS and GDP RS

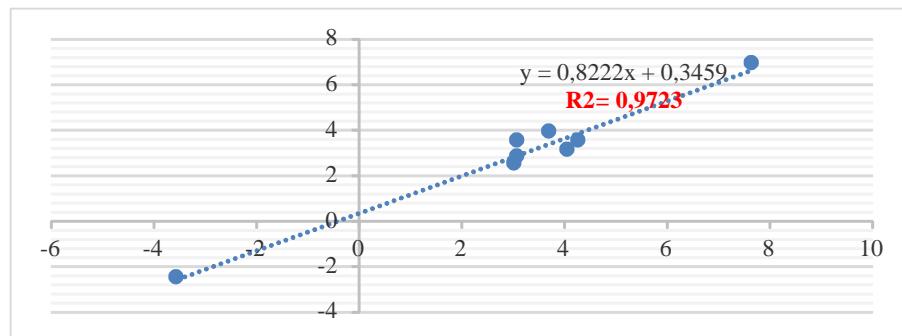
Dependent Variable: GDP RS				
Method. Least Squares				
Date: 05/15/23 Time: 12:15				
Sample: 1 7				
Included observations: 7				
Variable	Coefficient	Std. Error	t- Statistic	Prob.
C	0.345918	0.244459	1.415.036	0.2068
MFTP RS	0.822178	0.056700	1.450.061	0.0000
R-squared	0.972257	Mean dependent var	2.962.500	
Adjusted R-squared	0.967633	S.D. dependent var	2.592.813	
S.E. of regression	0.466471	Akaike info criterion	1.525.076	
Sum squared resid	1.305.570	Schwarz criterion	1.544.936	
Log likelihood	-4.100.302	Hannan-Quinn criter.	1.391.125	
F-statistic	2.102.676	Durbin-Watson	3.400.417	
Prob(F-statistic)	0.000007			

Source: Author Calculation, Statistical Software EVIEWS 9.

The results of the analysis show that the MFTP RS determination coefficient, $r^2 = 0.97$, is more precisely that changes in GDP RS are determined by MFTP RS GDP movement variations with 97%.

Thus, the results of the analysis show that there is a significant and direct connection between GDP MFTP RS and RS GDP, more precisely that economic development is highly dependent on MFTP RS development. The positive impact of the MFTP RS on RS is evident in the next chart:

Graph 3. Graph Regression GDP MFTP RS and GDP RS



Source: Author's calculation

Based on the previous analysis, it can be concluded that the economy of the Republika Srpska is very dependent on global influences. More precisely, the economy of Republika Srpska largely depends on the economic oscillations of countries with which there are a high degree of foreign trade.

3.2. Analysis of the impact of economic movements of the European Union to the economic growth of the Republika Srpska

Due to the high influence of global movements and crises, which in the previous period had a significant impact on European Union integration, it is necessary to test or quantify the influence of economic movements of European Union countries on the economy of Republika Srpska.

In this regard, the regression analysis of the above impact was given below.

Table 4. Analysis of GDP regression EU RS and GDP RS

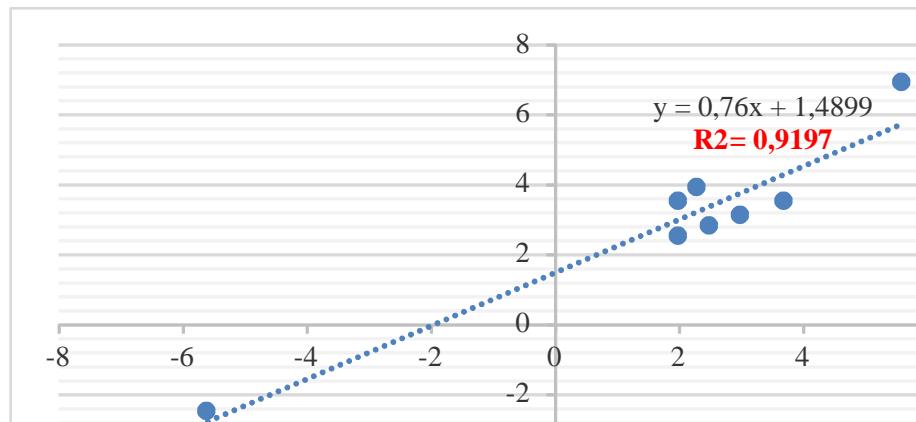
Dependent Variable: GDP RS				
Method: Least Squares				
Date: 05/16/23 Time: 13:25				
Sample: 1 7				
Included opservations: 7				
Variable	Coefficient	Std. Error	t- Statistic	Prob.
C	1.489.922	0.332189	4.485.162	0.0042
GDP EU	0.760040	0.091715	8.286.996	0.0002
R-squared	0.919651	Mean dependent var	2.962.500	
Adjusted R-squared	0.906260	S.D. dependent var	2.592.813	
S.E. of regression	0.793843	Akaike info criterion	2.588.456	
Sum squared resid	3.781.120	Schwarz criterion	2.608.316	
Log likelihood	-8.353.823	Hannan-Quinn criter.	2.454.505	
F-statistic	6.867.431	Durbin-Watson stat	2.876.403	
Prob(F-statistic)	0.000167			

Source: Author Calculation, Statistical Software EVIEWS 9.

The regression analysis of European Union countries and the impact of GDP Republika Srpska shows a high correlation $r = 0.959$ results of regression analysis, based on the statement of $R^2 = 0.92$, indicating that GDP RS is determined by variations of movement EU GDP with 92%. Based on this, it can be concluded that there is a

significant and direct connection between GDP and the realization of GDP RS, ie that the economic growth of the Republika Srpska in a high extent was determined by economic movements in the European Union. These conclusions can be clearly seen on the next regression chart.

Graph 4. Graph regression of GDP EU and GDP RS



Source: Author Calculation

Finally, the results and these regression analysis show significant conditionality, ie a high level of correlation of the analyzed indicators.

Based on the analysis of the MFTP RS and the EU, the EU is concluded in the position of the research, that the Republika Srpska is very dependent on the impact of external factors and that COVID 19 crisis on the Ukraine - Russia's route influenced the significant decline in the economy in Republika Srpska.

For adequate access to the measurement of previously analyzed impacts, it is very important

to measure economic activity, which is a result of economic activity in Republika Srpska, measured through the amount of primary balance, affects fiscal stability in Republika Srpska. Previously, we will also prove through the regression equation.

3.3. The impact of the economic movements of the Republika Srpska on its fiscal stability

Compared to the previous results, in this part of the analysis the results are different. The correlation coefficient is $r=0.628$.

Table 5. Regression analysis of EU RS GDP and RS GDP

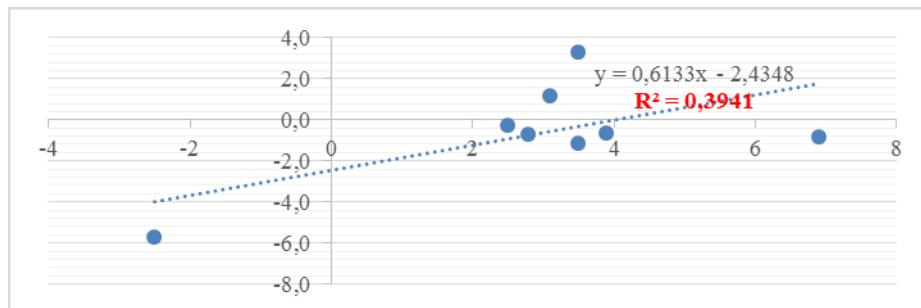
Primary balance				
Method: Least Squares				
Date: 05/17/23 Time: 14:29				
Sample: 1 7				
Included observations: 7				
Variable	Coefficient	Std. Error	t- Statistic	Prob.
C	-2.434753	1188557	-2.048.495	0.0864
БДП РС	0.613269	0.310436	1.975.511	0.0956
R-squared	0.394101	Mean dependent var		0.617944
Adjusted R-squared	0.293118	S.D. dependent var		2.532.902
S.E. of regression	2129570	Akaike info criterion		4.562.035
Sum squared resid	2.721.041	Schwarz criterion		4.581.895
Log likelihood	-1.624.814	Hannan-Quinn criter.		4.428.085
F-statistic	3.902.643	Durbin-Watson stat		2.176.743
Prob(F-statistic)	0.095617			

Source: Author Calculation, Statistical Software EVIEW 9.

The results show that there is a significant conditionality of the RS GDP movement with fiscal stability. The results of the regression

analysis, based on the coefficient of determination $r^2=0.394$, show that 40% of economic activity has an impact on fiscal stability.

Chart 4. Regression chart of RS GDP and RS GDP



Source: Author Calculation

CONCLUSION

The impact of global market movements on small and open economies is not disputed. That influence can be positive, but also negative. The analysis shows that the economy of Republika Srpska is under the enormous influence of the world market, i.e. changes in the economy of its main foreign trade partners. The results of the analysis show that there is a significant and direct connection between the economic trends of the countries with which Republika Srpska has the largest foreign trade exchange and the GDP of Republika Srpska. Therefore, the economic growth of Republika Srpska is highly determined by the economic growth of the previously mentioned countries. Considering that most of the foreign trade exchange of Republika Srpska takes place with the member countries of the European Union and that most of the foreign investments also come from the area of EU integration, the economic growth of Republika Srpska is largely determined by economic trends in the European Union. The results of the regression analysis show that the coefficient of determination of the GDP growth of Republika Srpska is significantly conditioned by the GDP growth of the European Union. In addition, its own level of economic activity is very important for the fiscal stability of Republika Srpska. Although fiscal stability is largely conditioned by the country's fiscal and monetary policy decisions, based on the analysis it can be concluded that Republika Srpska is very susceptible to external influence and market movements of the countries with which it has the largest foreign trade exchange. Based on that, it can also be concluded that global oscillations, which were the basic premise for this analysis, represent the basic determinant of the fiscal stability of small and open economies such as Republika Srpska. Considering the size and openness of the Republika Srpska economy, it can

be concluded that its economic activity is more influenced by external factors than internal economic growth. It is clear that by increasing economic activity, that level can be mitigated, but based on the results, it is concluded that there is a high impact of global events on economies with a low level of development, such as Republika Srpska.

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- Using regression analysis, the level of influence of economic trends was quantified:
1. The most important foreign trade partners of the Republic of Srpska on its economic growth,
 2. The economic trends of the European Union on the economic growth of the Republic of Srpska i
 3. The economic development of the Republic of Srpska on its fiscal stability, that is, on its primary balance.
- The results of the research confirm that there is a significant correlation of economic trends between the main foreign trade partners, European Union countries, and economic growth in the Republic of Srpska. It is concluded that, in addition to the aforementioned influences, fiscal stability in the Republic of Srpska is largely determined by the level of its economic activity.

SUMMARY

In the paper entitled the impact of global trends on economic growth and fiscal stability in the Republic of Srpska, the level of influence of global trends on small and open economies is analyzed, with a focus on the Republic of Srpska.

Therefore, it is assumed that the economy of the Republic is largely dependent on this influence and that in order to preserve fiscal stability and economic growth, it is necessary to quantify the level of this influence.

That quantification basically provides a good starting point for an adequate selection of measures and instruments to overcome the problems caused by developments on the global market.

In the introductory part of the paper, previous researches related to the connection between the openness of economies and their economic growth and the impact of that growth on fiscal stability are presented.

In addition, an analysis of the impact of the economic trends of the countries with which the Republika Srpska has the largest foreign trade exchange, European Union countries, on the economic growth of the Republika Srpska was made. Also, an analysis of the influence of the GDP of Republika Srpska on its fiscal stability was done.

The statistical method of regression and correlation was used in the analysis, applying the method of least squares with EViews 9 statistical software.

THE RIPPLE EFFECT: ANALYZING THE INFLUENCE OF CURRENT GEOPOLITICAL CHALLENGES ON NATIONAL ECONOMY (THE CASE OF RUSSIA)

EFEKAT TALASANJA: ANALIZA UTICAJU AKTUELNIH GEOPOLITIČKIH PROMJENA ZA NACIONALNU EKONOMIJU (SLUČAJ RUSIJE)

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Abstract: Current geopolitical shifts of tectonic scale generate a set of new challenges for global economic leaders all around the world testing their abilities to adjust fast enough to radically changing environment and finding the appropriate commercial solutions. Country's global leadership refers to its ability to influence the global economy through its policies, trade agreements, and military power. Rising economic powers are challenging the dominance of traditional ones. Taking under consideration the fact that Russia nowadays is in the center of geopolitical tension with enormous number of various sanctions imposed on it and being actually forced to take a set of retaliatory measures, the authors focus on future prospects of the country's commercial interaction with international counterparts on the basis of "BANI framework", introduced by Jamais. The Russian case fits into it well. It is brittle in terms of existing economic links; anxious regarding the future prospects of country's involvement into international economic transactions; nonlinear as there is a disconnection between cause and effect of all measures recently taken by the government and its opponents; and incomprehensible in terms of the future impact of existing situation to the world. The authors argue that current geopolitical tensions will inevitably

change the entire sphere of international business in general, its geographical composition in particular. Active interaction with these or that international partners for the companies and their leaders all around the globe gradually seems to be more of strategic imperative, rather than an issue of willingness and choice.

Key words: global leadership, geopolitical challenges, Russian Federation, BANI framework, economic sanctions, international trade

Apstrakt: Trenutne geopolitičke promjene tektonskih razmjera stvaraju niz novih izazova za globalne ekonomске lidere širom svijeta što testira njihove sposobnosti da se dovoljno brzo prilagode radikalno promjenljivom okruženju i pronalaze odgovarajuća komercijalna rješenja. Globalno vodstvo zemlje odnosi se na njenu sposobnost da utice na globalnu ekonomiju kroz svoje politike, trgovinske sporazume i vojnu moć. Rastuće ekonomске sile osporavaju dominaciju tradicionalnih. Uzimajući u obzir činjenicu da je Rusija danas u centru geopolitičkih tenzija sa ogromnim brojem raznih sankcija koje su joj nametnute i koja je zapravo primudrena da preduzme niz uzvratnih mjera, autori se fokusiraju na buduće izglede komercijalne interakcije zemlje

sa međunarodnim partnerima, na osnovu „BANI okvira“, koji je uveo Jamais. Ruski slučaj se dobro uklapa u to. Situacija je krhka u smislu postojećih ekonomskih veza; zabrinuta u pogledu budućih izgleda uključivanja zemlje u međunarodne ekonomske transakcije; nelinearna jer postoji nepovezanost između uzroka i posljedice svih mjera koje su nedavno preduzeli vlast i njeni protivnici; i neshvatljiva u smislu budućeg uticaja postojećeg stanja na svijet. Autori smatraju da će aktuelne geopolitičke tenzije neizbežno promijeniti cjelokupnu sferu međunarodnog poslovanja uopšte, a posebno njegov geografski sastav. Čini se da je aktivna interakcija sa ovim ili onim međunarodnim partnerima za kompanije i njihove lidere širom sveta postepeno više strateški imperativ, a ne pitanje volje i izbora.

Ključne riječi: globalno liderstvo, geopolitički izazovi, Ruska Federacija, BANI okvir, ekonomske sankcije, međunarodna trgovina

JEL classification: F13, F23, F51

1. INTRODUCTION

Recent geopolitical developments added strong arguments to support the claim made couple of years ago by Jamais Cascio. In particular he argues that a famous concept of “VUCA world” (with V standing for Volatile, U – for Uncertain, C – for Complex, A – for Ambiguous) tends to become substantially obsolete and has to be replaced by the “BANI framework” (with B standing for Brittle, A – for Anxious, N – for Nonlinear, I – for Incomprehensible). According to Cascio, this framework offers a lens through which to see and structure what’s happening in the world [5].

Regardless of a certain cautiousness (that from our perspective is needed in assessing real novelty of the approach)⁷ this is a challenge for almost everybody, twice as much for those who both consider themselves to be and are largely perceived by the others as global economic leaders. Among the virtues that could help the latter in finding appropriate responses there are intuition, as well as resilience in combination with flexibility. These are necessary to make and to implement consistently respective business decisions resulting from a comprehensive analysis of the current economic situation. Taking under consideration the fact that Russian Federation nowadays is in the center of geopolitical tension

⁷ In particular with respect to incomprehensibility one could recall a famous fragment from the Bible: “O the depth of the riches both of the wisdom and knowledge of God! how unsearchable are his judgments, and his ways past finding out!” (The Epistle of Paul the Apostle to the Romans, 11:33).

with enormous number of various sanctions imposed on it and being actually forced to take a set of retaliatory measures, the authors would like to focus on future prospects of the country’s commercial interaction with international counterparts. This is really a very relevant issue equally for Russian and foreign businesspersons.

2. RUSSIAN PARTICIPATION IN INTERNATIONAL ECONOMIC COOPERATION

After the collapse of the Soviet Union, Russia tried to expand its economic interaction with foreign partners.

During first two decades of the current century the country actively participated in international trade and investment cooperation accounting for a visible part of respective global transactions. Annexes 1 and 2 provide relevant information⁸. In particular, in case of trade for the period of 2005-2020 an average indicator of RF share in world merchandise export equals to 2.42% fluctuating between 1.77% in 2017 and 2.93% in 2008. In case of world merchandise import Russian share on average was 1.43% fluctuating between 1.01% in 2014 and 1.82% in 2013.

In contrast to visible trade, in trade in services Russian Federation constantly experienced deficit of the trade balance. Under the circumstances, for the same period an average indicator of RF share in world export of services equals to 1.16% fluctuating between 0.95% in 2020 and 1.39% in 2013. In case of world import of services Russian share on average was 1.84% fluctuating between 1.38% in 2020 and 2.81% in 2013. Assessing the developments of both components of Russian foreign trade one has to take under consideration – starting from 2014 – impact of sanctions and countersanctions. On top of that in 2020 COVID-19 influenced RF trade more than overwhelming majority of the leading trading nations [19].

Available data for 2005-2020 predictably enough demonstrate that Russian FDI inward and outward annual flows were substantially more volatile in comparison with foreign trade flows. The country’s share in world inward FDI fluctuated between 0.56% in 2015 and 4.30% in 2008. In case of outward FDI – between 0.85% in 2020 and 5.39% in 2013. At the same time, on average

⁸ The authors are fully aware that reliability of statistics (especially in case of FDI) is frequently challenged. Nevertheless, in our case the data are provided by the leading international economic organizations – WTO and UNCTAD – are the best available for international comparison; b) sufficient enough to reveal certain basic trends.

Russia accounted for 2.01% of the global FDI inflows and 2.61% of the global FDI outflows.

The authors would argue that above-mentioned data on Russian shares should not be perceived as something self-sufficient and isolated. Quite a legitimate question under the circumstances looks like the following: whether basic features of Russian economy create favourable preconditions for an active participation of the country in

international economic cooperation in general, international trade as original as well as basic form of the latter in particular? Let us discuss some of these relevant features.

Probably the most obvious issue here is the abundance of various – including strategic, i.e. critical for a proper functioning of majority of the economies on the globe – natural resources. Table 1 provides respective information.

Table 1. Share of RF in global reserves of selected natural resources, % %

Oil	6.2	Uranium	8.0	Nickel	11.0	Titan	12.4
Natural gas	19.9	Ferrous metals	14.9	Potassium salts	22.0	Gold	13.0
Coal	15.1	Bauxite	6.0	Zink	13.-	Silver	9.0
Rare earth metals	16.6	Copper	8.0	Wolfram	10.0	Diamonds	52.3

Source: Computed on the basis of: Statistical Review of World Energy 2021; О состоянии и использовании минерально-сырьевых ресурсов Российской Федерации в 2019 году. Москва 2020.

All that creates mighty incentives for interaction for both domestic and external economic agents. At the same time, well-known discussions on so called Dutch disease and Natural resource curse gave birth to the sensible opinion that abundant natural resources do not guarantee prosperity. More than that, this type of abundance could – at least sometimes – discourage and even hamper economic and social progress and could generate a conflict of interest between the members of international community.

On top of natural resource abundance during last several years, Russia has become a perceptible exporter of agricultural products. In particular, the country accounts for about 10% of the overall grain export. In case of wheat Russian share is above 18% [15].

The next point on our list relates to the territory of the country. Even after the collapse of the Soviet Union 1991, Russian Federation is still the largest country on our planet occupying 17 125.2 million square kilometers, i.e. about one ninth (or 11.4%) of the global dry land. Under the circumstances Russia predictably enough is number one on the globe in terms of number of neighbouring countries – 18 with common land border and 2 with common sea border [20].⁹

Taking under consideration relatively immature internal Russian transportation infrastructure one could probably perceive this as an additional factor facilitating the transborder trade. It happens to be correct only with respect to certain parts of European Russia¹⁰ and Russian Far East. At the same time in general, above-mentioned national geographical peculiarities rather create additional hurdles to foreign trade facilitation. George Friedman reasonably highlights an actual remoteness of the country from the major maritime trade routes claiming that “Russia is essentially landlocked. The ports on the Arctic Ocean are frequently frozen and the ports on the Black Sea and the Baltic Sea could have their access to the oceans blocked by enemies that control narrow straits. All of these ports are distant from most of Russia” [8].

the territory of a country? Shouldn't new technologies guarantee very high level of precision in measuring it? In general, they do. Meanwhile, in our specific case the gap between data in particular published by Russian Federation Federal State Statistics Service and by US Central Intelligence Agency The World Factbook is so to say politically- or rather geopolitically-driven. The point is that two sides fundamentally disagree regarding an affiliation of Crimea. Russian statistics treats the peninsula as part of the Russian Federation, adding its 26.1 thousand square kilometers to the territory of the country. In contrast to that, CIA perceives Crimea as part of Ukraine. Similarly, geopolitics generates the discrepancies in assessment of Russian population and the number of its neighbouring countries. Four of them are recognized as independent sovereign states only by Russian Federation and a very small number of other members of international community.

⁹ The data are borrowed from the official Russian sources. Respective data provided by other sources could differ. In a way - nothing extraordinary. For example, due to several reasons assessments of world merchandise export given by WB and the WTO do not match each other. In fact, certain discrepancies in data from various sources are typical for the majority of macro-economic indicators such as GDP, FDI flows and stocks, unemployment rate, etc. But what about

¹⁰ Less than on quarter of Russian Federation is geographically located in Europe.

At last, but not least, size of the population and overall level of economic development should definitely be mentioned. In case of the former, Russia with 146.2 million inhabitants is the 9th biggest country on the globe. As some kind of a dominant trend, large economies *paribus ceteris* tend to be regarding international trade less open in comparison with their smaller counterparts. In case of the latter, World Bank estimates Russian GDP per capita for 2020 in 10127 USD (at current exchange rate), that is higher than Indian (1928 USD) or Brazilian (6797 USD), almost equaling Chinese (10435 USD) and substantially lagging behind respective indicator of the USA (63594 USD) or Germany (46208 USD) [18]. Here

thinking of some kind of a dominant trend, one could sensibly argue that wealthier countries *paribus ceteris* tend to be regarding international trade more open in comparison with their less developed counterparts.

Taking all above-mentioned under consideration it seems reasonable to look at one of the basic relative indicators typically used to measure the involvement of any specific country in international trade or their so-called functional trade openness. Table 2 provides relevant information.

Table 2. Foreign trade quotas (merchandise export + merchandise import / GDP) for selected economies in selected years; (%)

	2015	2017	2018	2020
Mexico	68.7	73.2	75.9	75.4
Germany	70.9	71.0	71.2	67.1
South Korea	70.0	68.5	70.4	60.1
Canada	54.5	52.2	53.7	48.8
Russia	40.3	38.7	42.5	38.9
China	36.4	34.2	34.5	31.6
Indonesia	34.0	32.1	36.1	28.8
EU	23.9	24.4	24.8	27.5
Brazil	20.8	18.3	23.0	26.2
Japan	30.9	28.1	30.0	25.3
India	31.8	28.6	30.8	24.0
USA	21.2	20.4	20.9	18.3

Source: Computed on the basis of: WTO Trade Profile, 2016, 2018, 2019, 2021.

Assessing the data, the authors are tempted to claim that the Russian Federation – being ahead of at least several leading global traders with other more or less comparable economic characteristics – demonstrated unexpectedly high propensity to trade¹¹.

decisions with respect to business foreign activities within Russia or with Russian partners and for the leaders of Russian companies regarding their international transactions.

Due to variety of reasons Russian deliveries of the Western partners that traditionally accounted for a large share in RF foreign trade suffered substantially. Indeed, total volume of EU goods exports to Russia contracted by 52 % on a year-to-year basis in March 2022. Finland could be perceived as an illustrative example of this trend. Preliminary figures released by Finnish Customs show that Finland's goods exports to Russia fell by 58 % on a year-to-year basis in April 2022. Lower demand, EU export restrictions and voluntary withdrawals from the Russian market by Finnish firms led to a decrease in exports. The declines in exports registered in April occurred across-the-board, affecting nearly all goods categories. The value of Finnish goods exports to Russia in April was just 140 million euros, its lowest level in over two decades [3].

Under the circumstances, Russian business people in general reacted to the recent situation in two

¹¹ For more detailed discussion of the issue see: Russian Trade Policy: achievements, challenges and prospects / edited by Sergei Sutyrin, Olga Trofimenco and Alexandra Koval. Abingdon, Oxon; New York, NY: Routledge, 2019. P.306-310; Торговая политика России и стран Восточной Азии: поиск путей для взаимовыгодного сотрудничества: Монография / Отв. ред. И.А. Коргун, С.Ф. Сутырин. М.: ИЭ РАН, 2020. С. 28-37.

different ways. First group contracted or totally stopped their activities. Some of them even left the country. Second group in contrast intensified the efforts trying to capitalize on less competitive environment. In particular, according to Wildberries analytical report, 51% of Russian companies anticipate 1.5-3-fold expansion of their sales in 2022; 18% plan to start own production. Fashion goods, cosmetics and foodstuffs are among the most promising sectors. About 27% of the respondents already started to widen their product matrix to enter the new niches available after foreign brands left. Interesting enough that up to 70% of the respondents secured previously existed logistic routs [21].

At the same time, Russian deliveries to the West in their traditional ways also faced different obstacles. For example, many of Finland's top imports from Russia have already ceased. Imports of raw timber were discontinued already in March. Crude oil imports contracted sharply in March and April. Finnish Customs reports that no crude oil was imported from Russia in May. In addition, pipeline gas and electricity imports from Russia have stopped. Finnish coal imports will cease latest at the start of August under the EU ban on coal imports [3].

With respect to a large variety of products Russian companies try to find alternative routes to reach the customers. In particular, a total of 288 legal and physical persons from Russia opened companies in Serbia already as soon as the end of March 2022 since the war in Ukraine broke out on 24 February. The newly-established Russian firms have been registered for programming operations, unspecified retail sales, business consulting and management, and IT consulting. Agency for Business Registries (ABR) data shows that Serbia has 876 companies owned entirely or partly by Russians and 524 entrepreneurs, not including shareholder societies, majority-owned by Russia, such as the Serbian Oil Industry (NIS), YUGOROSGAZ, Lukoil Serbia [7]. Similarly, in April 2022, Russians with 136 new entities became the leaders among foreigners who established their companies in Turkey. Significantly enough that the second in the list – with 120 companies – were Iranians.

Another noticeable development resulted from the policy of the Western countries aiming at creating as much as possible obstacles for the Russian companies in gaining access to international financial markets, including modern system of payments dominated by US dollar. According to Bloomberg, monthly volumes of the ruble-yuan pair surged by the end of May 2022 up to almost \$4 billion – nearly 12 times the volumes in

February – since the start of the war in Ukraine as the two nations seek to reduce their reliance on American currency and boost bilateral trade to overcome current and potential US sanctions [1]. To be fair one should take under consideration that the current flight from dollar in fact strongly facilitated the trend that had emerged substantially before – at least a decade ago – when Russian Federation trying to diversify geographical composition of its international economic links had started to intensify cooperation with the Asian countries, especially China.

The challenge faced by foreign business community concerning the commercial operations within Russia or with Russian partners is also a difficult one. In many instances the companies from the countries that imposed sanctions on Russian Federation – regardless of their own purely economic considerations – simply can't resist anti-Russian political pressure. Five months after the start of military conflict there are sound reasons to argue that especially in case of EU economy became a real hostage of the geopolitics. In particular, according to Bloomberg, German top union officials claimed in beginning of July that the leading national industries could face collapse because of cuts in the supplies of Russian natural gas. "Because of the gas bottlenecks, entire industries are in danger of permanently collapsing: aluminum, glass, the chemical industry," said Yasmin Fahimi, the head of the German Federation of Trade Unions (DGB), in an interview with the newspaper Bild am Sonntag. "Such a collapse would have massive consequences for the entire economy and jobs in Germany." In his turn Economics Minister Robert Habeck said that the government is working on ways to address the surging costs both utilities and their customers face, without giving details. Earlier he had warned that the squeeze on Russian gas supplies risks creating deeper turmoil, likening the situation to the role of Lehman Brothers in triggering the financial crisis in 2008 [10].

The attitude of foreign companies undertaking their economic activities in Russia varies substantially after February, 2022. Some of them made quick decisions to leave the country. Thus, Volkswagen Group Rus stopped production in Nizhny Novgorod at the facilities of GAZ. The company explained this by a high level of uncertainty and the inability to predict a potential resumption of production. ABB, Siemens, and many others also leave the country.

Many companies that are leaving the country sell their assets to Russian managers. Thus, The Norwegian chemical company Jotun, one of the world's leading manufacturers of decorative paints,

marine, industrial and powder coatings, announced the sale of all assets in Russia and further exit from the Russian market. Mishelin, Otis, and many others demonstrate the same pattern. Another group of potential buyers comes from “neutral” countries. Businessmen from China, Turkey, India and Korea indicated their interest in getting new promising assets.

All in all, over 500 companies made decisions to suspend their activities or leave Russia in 2022. One can guess what were the motives behind such decisions. Some managers dare to say about external pressure that compel them to do so. For example, Reinold Geiger, the Chairman & CEO of L'Occitane considered it unfair to force businesses to leave the country. He argues that sanctions against Russian Federation are "severely punishing" European companies, adding that when peace comes, EU firms will have to "be patient" to regain lost market share. Stores that previously belonged to the French chain L'Occitane and recently changed their signage to L'Occitane have come under the control of Russian top managers. Russia provided the French retailer with more than 3% of all sales [13].

Austrian Raiffeisen bank is also under the pressure. Initially, the Russian "daughter" of the bank announced its intention to continue working in Russia. This approach seems reasonable as the local subsidiary brings the parent company more than a third of the entire group's profit. At the same time, later representatives of the bank declared that the managers are evaluating all strategic options for the future, including a "carefully considered exit" [6].

According to a consulting company Aspring Capital, Most Western companies are not eager to pack up and leave here and now, and would be happy to continue doing business in Russia. But many of them are under serious pressure on this issue from their headquarters. Many companies considering the leave take a wait-and-see attitude and carefully consider different options. Technical difficulties in agreeing on the terms for the further use of trademarks, technologies, IT systems is another reason for the slowdown of the leave [14].

Some companies continued operations in Russia, but with some limitation. Nestle, for example, already in March 2022 announced that it will stop deliveries of Nespresso coffee and San Pellegrino mineral water to Russia. Nestle also stopped investing in Russian projects. The company plans importing and exporting only essential goods [12]. From September 1, 2022 DHL Express stops delivering goods within Russia. After that day the company will continue only to provide delivery services from Russia abroad.

In contrast, Leroy Merlin continues to work in Russia. The company decided not to stop its activities in the country. The retailer announced that after a number of other foreign firms left Russia, it is open to proposals to increase supplies and expand the range. Leroy Merlin has intensified the search for a new range and replacement of goods with which there are difficulties in supply or production. It also decided not to penalize partners for under deliveries and considers requests for changes in purchase prices in a shortened time frame [11]. Orion Group, one of the oldest South Korean companies, producing confectionery and snacks, reaffirms commitment to Russian market. The company even planned to expand production by launching a new factory [9].

As for the business entities from the countries that did not support Western policy towards Russia, they often behave in a cautious way. The point is that respective companies have to take under consideration the risks of potential losses associated with so-called secondary sanction. Under the circumstances they can't fully and openly exploit opportunities resulting from the decision of their Western competitors to leave the Russian market.

Thus, one could expect that import from China would substantially substitute a large variety of products that are not available in Russia any more from traditional sources. But some companies from PRC demonstrate opposite attitude. For example, computer maker Lenovo and smartphone producer Xiaomi have cut shipments to Russia amid fears of Western sanctions and pressure from suppliers, including Western companies. Chinese companies usually do not openly announce the actual curtailment of business, although there are exceptions. In April, 2022 this was Dajiang Innovation, which produces drones. The company left both Russia and Ukraine [17].

All in all, trade data shows that the value of China's goods exports to Russia has contracted since February 2022 in all major categories. For the March-May period, China's exports to Russia in the machinery & equipment category were down by 9 % y-o-y and in the electronics category by 33 %. Exports of cars from China to Russia fell by 8 % y-o-y while textiles [2].

At the same time, limitations connected to exports of Russian products to traditional partners forced the local businesses to look for new and expanding existing markets of “neutral” countries. For example, India recently became a substantial consumer of Russian crude oil: it amounts to nearly a quarter of India's total oil imports. Before February 2022, the share was less than 1 % of India's oil imports. The growth reflects the fact

that Russia is selling its oil at a discount due to Western sanctions [4].

Discussing the prospects for foreign companies in doing business within Russia or with Russian partners it seems sensible to bring attention to possible changes in *modus operandi* of Russian consumers, in particular in B2C marketing framework. One of the authors of the present paper some time ago argued that as a whole their attitude towards foreign products/brands/values starting from early 1990s gradually evolved from some kind of “inferiority complex” with regard to the goods made abroad to much more balanced but still generally more or less positive perception [16]. Due to the pressure of sanctions – in most of the cases generating national consolidation and more patriotic mentality – Russian consumers could start rejecting certain products just because of their foreign origins clearly prioritizing domestic counterparts.

CONCLUSION

Current geopolitical tensions will inevitably change the whole sphere of international business in general, its geographical composition in particular. Meanwhile active interaction with these or that international partners for the companies and their leaders all around the globe gradually seems to be more of strategic imperative, rather than an issue of willingness and choice. It goes without saying that above-mentioned interactions[?] generate not only extra advantages and gains. There are also substantial associated costs, risks and problems. They make the process far from being simple, smooth and straightforward. International cooperation has experienced ups and downs; currently “de-globalization” is a buzz word for many academics and politicians; pandemic of COVID-19 encouraged the countries to reduce almost any forms of collaboration with other members of international community. Geopolitical tension adds a lot of “salt and pepper” to already existed problems. Nevertheless, focus on national economic isolation by all means does not look like an acceptable alternative.

The current situation around Russia fits into “BANI framework”. It is brittle in terms of existing economic links; anxious regarding the future prospects of country’s involvement into international economic transactions; nonlinear as there is a disconnection between cause and effect of all measures recently taken by the government and its opponents; and incomprehensible in terms of the future impact of existing situation to the world. The current challenges not only coursed the

losses, but also opened a window of opportunities for those who has no fear to use it.

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SUMMARY

The Paper tries to focus on future prospects of the country's commercial interaction with international counterparts. Russian Federation nowadays is in the center of geopolitical tension with enormous number of various sanctions imposed on it and being actually forced to take a set of retaliatory measures. This is a very relevant issue equally for Russian and foreign businesspersons. The following factors influence Russia's participation in international economic relations: a large number of explored and extracted natural resources that led to the Dutch disease, huge territory and relatively immature internal transportation infrastructure, severe climate conditions that reduce the number of non-freezing ports, a relatively small population compared to

the territory occupied by the country, the concentration of economic activity in a comparatively small western region of the country. All in all, the Russian Federation – being ahead of at least several leading global traders with other more or less comparable economic characteristics – demonstrated unexpectedly high propensity to trade.

A first substantial set of measures affecting Russia's participation in international economic relations was introduced in 2014, both by a number of foreign countries and the government of Russian Federation. Starting from late February 2022, a new wave of geopolitical confrontation provides a set of new challenges for global economic leaders all around the world testing their analytical skills, their ability to adjust fast enough to radically changing environment finding the appropriate commercial solutions. Many traditional trade channels began to collapse, the "turn to the East" sharply intensified. Russian business people in general reacted to the recent situation in two different ways. First group contracted or totally stopped their activities. Some of them even left the country. Second group in contrast intensified the efforts trying to capitalize on less competitive environment. Under the influence of external factors and internal beliefs, many foreign companies began to leave the Russian market, while additional opportunities to conquer the Russian market appeared for domestic companies and firms that are not directly or indirectly involved in the sanctions policy.

Another noticeable development resulted from the policy of the Western countries aiming at creating as much as possible obstacles for the Russian companies in gaining access to international financial markets, including modern system of payments dominated by US dollar. Trading in euros is also limited. Such situation forces companies to switch to trading in national currencies with the main foreign trade partners. This allows businesses to get away from transaction problems and shows an example to other countries.

The current situation around Russia fits into "BANI framework". It is brittle in terms of existing economic links; anxious regarding the future prospects of country's involvement into international economic transactions; nonlinear as there is a disconnection between cause and effect of all measures recently taken by the government and its opponents; and incomprehensible in terms of the future impact of existing situation to the world. The current challenges not only coursed the losses, but also opened a window of opportunities for those who has no fear to use it.

THE ANALYSIS OF THE ASSOCIATION OF THE Maturity LEVEL OF A PROCESS-ORIENTED ORGANIZATION AND ACTIVITY INDICATORS

ANALIZA POVEZANOSTI NIVOA ZRELOSTI PROCESNO ORIJENTISANE ORGANIZACIJE I POKAZATELJA AKTIVNOSTI

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Abstract: This research analyzes the relationship between the maturity level of a process-oriented organization and the enterprise activity indicators. The aim of the research is to determine whether there is a statistically significant influence of the maturity level of a process-oriented organization on activity indicators. In this empirical research, a case study was used, and the research is conducted in an organization that has been process-oriented for a long period and has reached a high level of maturity. Concerning the enterprise's activity indicators, the following were analyzed: business asset turnover ratio, fixed asset turnover ratio, capital turnover ratio, current asset turnover ratio, inventory turnover ratio and accounts receivable turnover ratio. The methods used in the research include descriptive statistics and Spearman's correlation test. It is expected that the results of the research will give insight into how significant the level of maturity of a process-oriented organization is on activity indicators.

Key words: a process-oriented organization, maturity level, activity indicators, enterprise,

process management, a process approach to business

Apstrakt: U ovom istraživanju analizira se veza između nivoa zrelosti procesno orijentisane organizacije i pokazatelja aktivnosti preduzeća. Cilj istraživanja je da se utvrdi da li postoji statistički značajan uticaj nivoa zrelosti procesno orijentisane organizacije na pokazatelje aktivnosti. U ovom empirijskom istraživanju korišćena je studija slučaja, a istraživanje se sprovodi u organizaciji koja je već duži vremenski period procesno orijentisana, te je dospila i visok nivo zrelosti. Od pokazatelja aktivnosti preduzeća analizirani su sljedeći: racio obrta poslovne imovine, racio obrta fiksne imovine, racio obrta kapitala, racio obrta obrtne imovine, racio obrta zaliha i racio obrta potraživanja od kupaca. Metode koje se koriste u istraživanju uključuju deskriptivnu statistiku i Spearman-ov test korelacije. Očekuje se da će rezultati istraživanja dati uvid u to koliko značajan uticaj ima nivo zrelosti procesno orijentisane organizacije na pokazatelje aktivnosti.

Ključne riječi: procesno orijentisana organizacija, nivo zrelosti, pokazatelji aktivnosti, preduzeće, upravljanje procesima, procesni pristup poslovanju

JEL classification: M10, M21, L25

1. INTRODUCTION

Activity indicators of an enterprise are used to evaluate enterprise performance in a certain period. These indicators are used to observe how the enterprise uses its resources and how successful it is in the management of its business operations. The process maturity of an enterprise can have a significant impact on activity indicators, including inventory turnover. Process maturity refers to the level of process maturity within an enterprise, that is, how well-defined, documented and optimized processes are in order to obtain a high level of efficiency and effectiveness. Therefore, the subject of research in the paper is the analysis of the influence of an enterprise's process maturity on activity indicators. The aim of the research is to determine whether there is a statistically significant influence of the maturity level of a process-oriented organization on activity indicators.

The paper consists of three parts. The first part refers to the review of current literature in this area, as well as presenting empirical conclusions by other authors on the subject of the influence of a process-oriented organization on financial and other indicators of a company. The research methodology is described in the second part, and the results obtained in this research are presented in the third part.

2. LITERATURE REVIEW

The results of business processes can have internal or external users, which means that their results are important for both the organization itself and its clients. However, business processes also need to be efficient in the sense that they satisfy the requirements regarding the time of realization and expenses. The managers who manage certain business processes are called process owners. For process orientation to be successful and produce the expected results, business processes need to be carefully defined, clearly determined and transparent so as to attain high efficiency and quality in business (Radosavljević, 2016).

McCormack and Johnson (2001) conducted research which studied the connection between process orientation and business performance in an organization. The results of the study showed that organizations with process orientation have fewer conflicts within the organization and better

connection between the employees. Also, the research showed that an organization's process orientation has a positive influence on business performance, which means that organizations that adopt process orientation have better business results. This study emphasizes the importance of process orientation in achieving better performance and the organization's success (McCormack & Johnson, 2001).

In his paper, the author Gudelj, M. (2021) researched and formed the model of business process performance management in a process-oriented operations management. The given research was conducted with the aim of connecting BPM and PPM in a way that shows the importance of creating a business process model and its influence on the quality of the organization's performance management (Gudelj, 2021).

Skender, D. (2020) describes the influence of process organization on the business result of small and medium-sized companies. The research focuses on determining how the maturity of process organization influences small and medium-sized company performance and the identification of key factors, which are of great importance for achieving business success in these organizations.

Certain research confirmed the positive influence of process orientation maturity on performance improvement (Kahrović i Krstić, 2015).

The authors Tadić, Arsovski, Aleksić, Stefanović and Nestić clarified, in their work, „A Fuzzy Evaluation of Projects for Business Processes' Quality Improvement” that business process improvement is important for the success of enterprises according to quality standards, such as ISO 9000:2008. One successful approach is including projects for the purpose of quality improvement. This paper proposes a model for evaluating such projects. Project performance is analyzed using ISO 21500:2015 standard and good practice. The adoption of the process approach as one out of seven principles of quality management in business is promoted by ISO 9001:2015 standards. Project performance values are determined by the project management team's measurement or evaluation (Tadić, Arsovski, Aleksić, Stefanović and Nestić, 2015).

Defining business processes in an organization is explained in different ways by numerous experts and theoreticians. In the simplest terms, business processes describe how something is done in an organization. However, the unique definition of business process does not exist and it depends on the context in which it is used (Borovina, 2016). Within social sciences, a process is defined as a

phenomenon that changes over time, and in that regard, it observes process as something dynamic, intangible and without a clearly defined structure (Račić, 2008). Accepting process orientation enables an enterprise to view doing business as an integrated process that moves through different functions and organizational units. The emphasis is on realizing total value for users and other stakeholders. This implies comprehending how every function and unit contributes toward creating that value and how their cooperation can improve total enterprise performance. Process orientation encourages teamwork, cooperation and constant process improvement, which leads to better results and user satisfaction (Radosavljević, 2016).

In his work, Business process management: A boundary-less approach to modern competitiveness, the author Zairi emphasized that “the best organizations have recognized the need of shifting focus from a traditional, functionally based approach to management via a set of clearly defined, consumer-guided processes” (Zairi, 1997). Business process management is an approach to management that promotes adopting process orientation as a way of doing business. This approach implies a holistic view of the organization, observing it as a unified whole made up of various functions, instead of observing it as a collection of individual parts. Business process management recognizes complex relations between factors that influence the entire organization, which complicates drawing conclusions on the results of the company's doing business. Many authors think that business process management also includes change management. This perspective encompasses all the activities that

occur during the process life cycle, including defining, modeling, implementing, controlling, analyzing and improving or optimizing a process. Business process management aims at continuous process improvement in order to achieve greater efficiency, productivity and customer satisfaction (Radosavljević, 2016).

3. RESEARCH METHODOLOGY

The subject of the research in this paper is the analysis of the associations between the level of process-oriented organization maturity and enterprise activity performance. In accordance with this, the main goal of the research is to examine whether the level of enterprise maturity influences enterprise activity indicators, and if it does, how strong they are.

An individual case study was used for the needs of empirical research, whereby a company from Bijeljina was chosen, in order to examine the association between the process maturity level and enterprise activity performance. The enterprise from the case study fulfills the primary requirement for this analysis, which is that the enterprise has been process-oriented for eight years, thus it is suitable for analysis. The enterprise from the case study belongs to the processing sector, so its core activity is the production and processing of wood products. The level of process-oriented organization maturity was measured with a Likert scale, based on questions in questionnaires and interviews conducted with the management. The questionnaire is clearly and precisely formulated, with 15 questions referring to the enterprise process maturity (Table 1).

Table 1 Overview of the questions in the questionnaire

No.	QUESTIONS	GIVEN RESPONSES
1.	The organizational structure in the enterprise is designed in such a way as to enable smooth business processes through business functions.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
2.	The employees are acquainted with the concept and meaning of business processes.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
3.	The enterprise regularly conducts market analysis in order to be able to respond to the needs and requirements of customers.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
4.	The application of business processes enhances cooperation and teamwork, rather than commands and control.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree

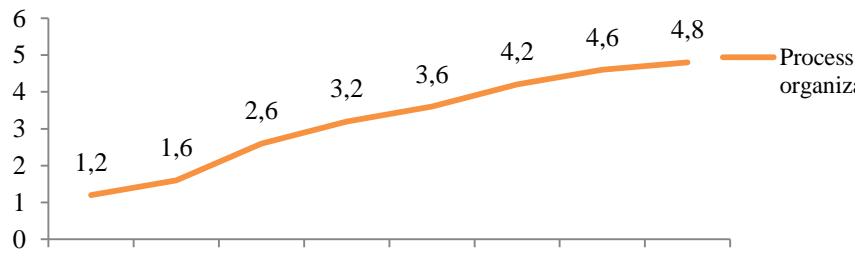
		5. I strongly agree
5.	The role of the management in the enterprise is solely based on mentorship, and not on employee supervision.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
6.	The processes within the organization are clearly defined, with clearly defined goals and results for customers and suppliers.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
7.	Employees from different organizational units are allocated into process teams.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
8.	The enterprise has specially defined the role of the owner of detailed processes and conducts it successfully in practice, so each business process has a process owner.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
9.	All the employees, and especially the members of a process team understand the process development in its entirety.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
10.	Managers motivate the employees to propose the improvement of business processes.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
11.	The enterprise leadership is focused on constant business process improvement, which is supported by information technology.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
12.	Business process success is measured in the organization.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
13.	Information system in the enterprise supports managers and provides them with information on business process performance.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
14.	The quality of the results of business processes is measured in the organization.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree
15.	Business processes influence the improvement of financial performance at a higher maturity level.	1. I strongly disagree 2. I disagree 3. Neutral 4. I agree 5. I strongly agree

Source: the authors

The respondents answered the questions with grades from 1 to 5, which is very useful as it enables getting a more precise picture of the business of the enterprise. Every question was a Likert item consisting of 5 points from "I strongly disagree" to "I strongly agree". In this case, the

questionnaire was filled out by the commercial director and head of accounting, and Graph 1 presents the value of the enterprise maturity variable per year of observation, which is calculated on the basis of the average grades of the respondents regarding the 15 questions.

Graph 1 Process-oriented organization maturity in the period from 2014-2021



Source: the authors

In order to understand whether all the questions in this questionnaire measure the same latent variable reliably (in order for a Likert scale to be constructed), Cronbach's Alpha was conducted. Cronbach's Alpha (α) takes values between 0 and 1, and the higher the value of this coefficient is, the

questionnaire is more reliable. When it comes to reliability criteria of measuring scales, Kline (Kline, 1998) states that if the reliability coefficient (including Cronbach's Alpha coefficient) values at around 0,9, reliability can be considered to be excellent.

Table 2 Cronbach's Alpha reliability coefficient

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	No. of Items
.994	.994	15

Source: the authors

Based on Cronbach's Alpha coefficient presented in the previous table, it can be concluded that the applied measuring scales possess an exceptional level of reliability. The high value of Cronbach's Alpha coefficient of 0.994 indicates that the items in the test (which is used to measure the maturity levels of a process-oriented organization maturity) are highly reliable and interconnected. It suggests that the test is probably successful in measuring process-oriented organization maturity and that it could be used as a reliable instrument for evaluating that organization's characteristics. The

established instruments for evaluating process organization maturity as a construct which represented an independent variable in research models, show that the maturity level of process organization from the case study in 2021 amounted to 4,80 measured according to a Likert scale. This means that the organization that was the subject of this study is relatively highly ranked regarding process maturity. Performance indicators of enterprise activities that were used in this study are shown in Table 3, as well as their method of calculation.

Table 3 Enterprise activity indicators

Indicators	A method of calculation
Business asset turnover ratio	Total revenue/business assets
Fixed asset turnover ratio	Total revenue/fixed assets
Capital turnover ratio	Total revenue/capital
Current asset turnover ratio	Total revenue/current assets
Inventory turnover ratio	Total revenue/inventory
Accounts receivable turnover ratio	Total revenue/accounts receivable

Source: the authors according to Radosavljević (2016) and Soldić-Aleksić (2015)

The SPSS program was used for conducting quantitative analysis, whereby several tests for examining the relationship between the process maturity level and activity performance were carried out. The analysis was started with descriptive statistics methods, then correlational analysis was used, specifically Spearman's correlation test for detecting the associations between variables.

4. RESEARCH RESULTS

4.1. Descriptive statistics

The SPSS program was used for data analysis, and the first step in this research was to examine whether data were normally distributed.

Regardless of the size of the sample, Lilliefors modification of the Kolmogorov-Smirnov test and the Shapiro-Wilk test is usually used in the SPSS program, and the same was applied in this paper to determine the normality of distribution. Accordingly, the hypothesis on the normality of data distribution is proposed:

H₀: Variables in the sample are normally distributed

H₁: Variables in the sample are not normally distributed

In both abovementioned tests, it is necessary to check whether the probability we use to decide on the null hypothesis is greater than the level of significance at which we conclude, which is 0.05.

Table 4 The test of normality of data distribution

	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Enterprise maturity	.141	8	.200*	.934	8	.554
Business asset turnover ratio	.207	8	.200*	.858	8	.115
Fixed asset turnover ratio	.172	8	.200*	.953	8	.745
Capital turnover ratio	.173	8	.200*	.917	8	.405
Current asset turnover ratio	.266	8	.100	.850	8	.094
Inventory turnover ratio	.171	8	.200*	.977	8	.948
Accounts receivable turnover ratio	.334	8	.009	.723	8	.004

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

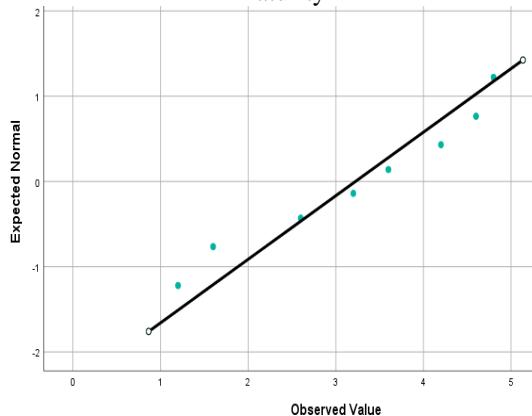
Source: the authors

The abovementioned table presents the results from two well-established tests of normality, and those are Kolmogorov-Smirnov and Shapiro-Wilk test. Shapiro-Wilk test is more appropriate for small samples (< 50 samples), so for that reason, the Shapiro-Wilk test will be used as a numerical tool for evaluating normality. Based on data in Table 4, a conclusion is drawn that data are normally or near-normally distributed considering that the probability (Sig.) in both, Lilliefors modification of the Kolmogorov-Smirnov test and the Shapiro-Wilk test is higher than 0.05 (except in accounts receivable turnover ratio, when it is less than 0.05). Considering it is a case study on the example of an enterprise, and so the sample is small, a graphical method Normal Q-Q plot is also used for examining the normality of data distribution. According to this method of determining the normality of data, it is necessary that every point is on the line itself or near it, and that it shapes the straight line as well so that data

are considered to be of normal distribution. In most cases, this type of diagram is used for visual determination of whether the data set follows normal distribution or not.

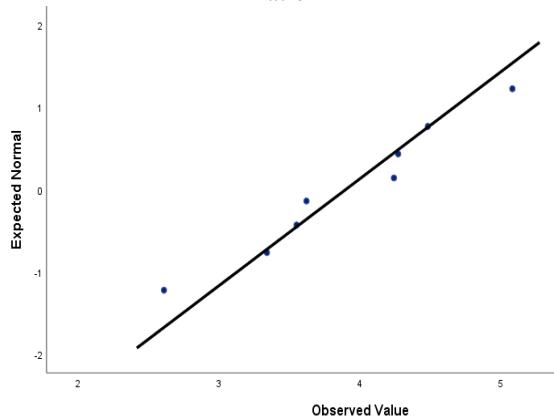
It is concluded, in the research, that all the variables, except for the accounts receivable turnover ratio, arise from normal distribution, as the points in the diagram, which represent individual observations, are grouped around a straight line. Larger deviations from the straight line indicate that data distribution is different from normal distribution (Soldić-Aleksić, 2015). In this case, the null hypothesis, which states that the variables in the sample follow normal distribution, cannot be rejected. Based on the following graphs, we can conclude that data appear to be of normal distribution, as they closely follow the diagonal and they do not appear to have a non-linear pattern, except for the variable of the accounts receivable turnover ratio (Graph 8).

Graph 2 Normal Q-Q plot for enterprise maturity



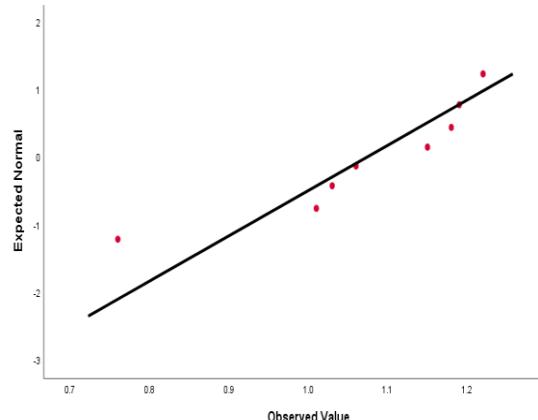
Source: the authors

Graph 5 Normal Q-Q plot for capital turnover ratio



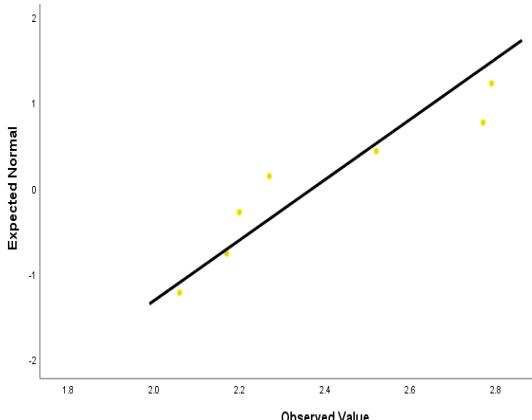
Source: the authors

Graph 3 Normal Q-Q plot for business asset turnover ratio



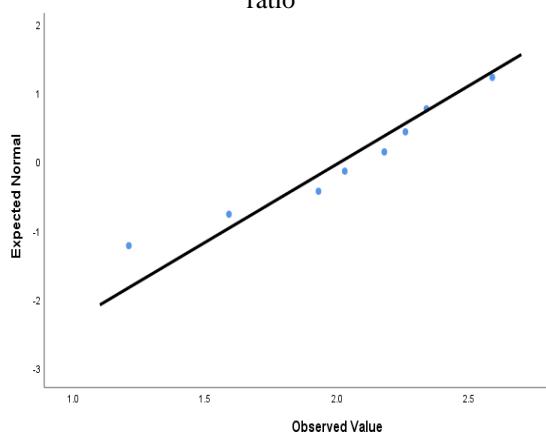
Source: the authors

Graph 6 Normal Q-Q plot for current asset turnover ratio



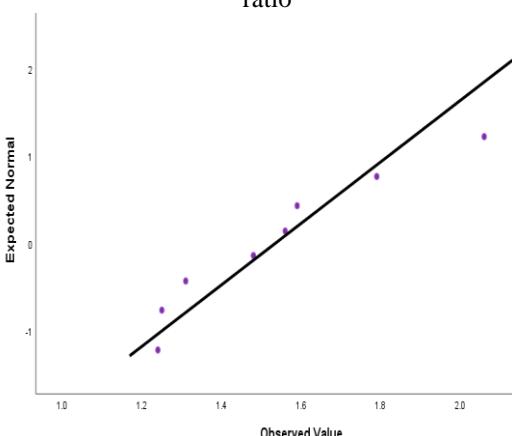
Source: the authors

Graph 4 Normal Q-Q plot for fixed asset turnover ratio



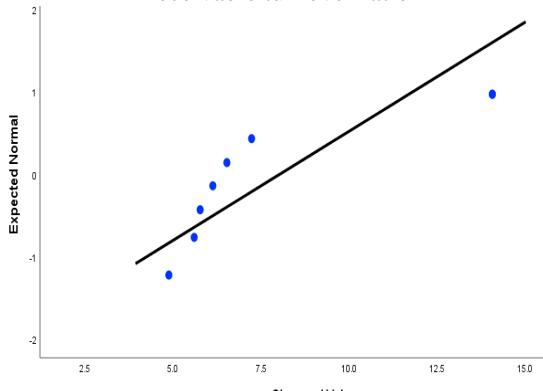
Source: the authors

Graph 7 Normal Q-Q plot for inventory turnover ratio



Source: the authors

Graph 8 Normal Q-Q plot for the accounts receivable turnover ratio



Source: the authors

4.2. Correlational analysis

Spearman's correlation test was used to determine the associations between process-oriented

organization maturity and enterprise activity indicators.

This correlation test is a non-parametric test used to measure a monotonous association between the variables. Spearman's correlation test is used when data are not normally distributed or when linear dependence between variables cannot be hypothesized. Spearman's test is used to evaluate the strength of the correlation between two variables, and the obtained values range from -1 to +1. The value of -1 signifies a perfectly negative correlation, 0 signifies the absence of correlation, and +1 signifies a perfectly positive correlation.

Before the very use of Spearman's correlation test, it is necessary to represent enterprise process maturity and activity indicators as ranks rather than nominal numbers, as Spearman's correlation recognizes only ordinal data displayed as the ranks of given variables (Table 5), considering it is a non-parametric test.

Table 5 The ranks of variables

Maturity rank	Business asset turnover ratio rank	Fixed asset turnover ratio rank	Capital turnover ratio rank	Current asset turnover ratio rank	Inventory turnover ratio rank	Accounts receivable turnover ratio rank
1	8	5	8	7	8	4
2	5	7	7	5	5	1
3	7	6	5	6	7	3
4	6	8	4	2	3	2
5	4	4	3	3.5	2	5
6	3	3	2	3.5	1	7.5
7	1	1	1	1	4	6
8	2	2	6	8	6	7.5

Source: the authors

In order to examine the association between enterprise maturity and activity indicators, the following hypotheses are posed:

H1: There is a statistically significant association between enterprise maturity levels and business assets turnover coefficient.

H2: There is a statistically significant association between enterprise maturity levels and the fixed asset turnover coefficient.

H3: There is a statistically significant association between enterprise maturity levels and capital turnover coefficient.

H4: There is a statistically significant association between enterprise maturity levels and the current asset turnover coefficient.

H5: There is a statistically significant association between enterprise maturity levels and inventory turnover coefficient.

H6: There is a statistically significant association between enterprise maturity levels and accounts receivable turnover coefficient.

Considering that Spearman's correlation test is used when data are normally distributed, the correlation coefficient is also examined regarding the accounts receivable turnover ratio variable.

Table 6 Correlational analysis

		Correlations		
Spearman's rho	Enterprise maturity	Correlation Coefficient	1.000	
		Sig. (2-tailed)	.	
		N	8	
	Business asset turnover ratio	Correlation Coefficient	-.905**	
		Sig. (2-tailed)	.002	
		N	8	
	Fixed asset turnover ratio	Correlation Coefficient	-.762*	
		Sig. (2-tailed)	.028	
		N	8	
	Capital turnover ratio	Correlation Coefficient	-.643	
		Sig. (2-tailed)	.086	
		N	8	
	Current asset turnover ratio	Correlation Coefficient	-.228	
		Sig. (2-tailed)	.588	
		N	8	
	Inventory turnover ratio	Correlation Coefficient	-.452	
		Sig. (2-tailed)	.260	
		N	8	
	Accounts receivable turnover ratio	Correlation Coefficient	.790*	
		Sig. (2-tailed)	.020	
		N	8	
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

Source: the authors

According to the data in Table 6, a conclusion is drawn that there is a statistically significant association toward the Spearman's test between process-oriented organization maturity and the following activity indicators: business asset turnover ratio ($p=0.002$), fixed asset turnover ratio ($p=0.028$) and accounts receivable turnover ratio ($p=0.020$).

Accordingly, the hypotheses H1, H2 and H6 are not rejected, while the hypotheses H3, H4 and H5 are rejected, because of $p>0.05$.

Considering that there is a statistically significant association between process-oriented organization maturity and business asset turnover ratio, fixed asset turnover ratio and accounts receivable turnover ratio, the direction and the strength of the association are further examined.

Table 7 Rules of thumb related to correlation coefficient

Correlation coefficient	The description of the strength of the association between variables
0.81-1.00	Very strong
0.61-0.80	Strong
0.41-0.60	Moderate
0.21-0.40	Weak
0.00-0.20	Non-existent

Source: Soldić Aleksić, J., & Chroneos Krasavac, B. (2009). *Kvantitativne tehnike u istraživanju tržišta: Primena SPSS računarskog paketa*. Prvo izdanje. Ekonomski fakultet u Beogradu.

The correlation between variables of process-oriented organization maturity and business asset turnover ratio is negative, and also very strong because the correlation coefficient is in the interval 0.80-1.00 (Soldić Aleksić & Chroneos Krasavac, 2009). Considering that there is a negative correlation between the enterprise process maturity and business asset turnover ratio, it could mean that the growth of process maturity of the enterprise leads to decreasing business asset turnover ratio, that is, the business assets of the enterprise move more slowly in the business process. This can imply that the enterprise has not fully used its process potential. It is important to bear in mind that correlation does not imply a causal relationship between these two variables, and further research is needed to understand why there is a negative correlation between these two variables in a concrete case. By polling the management of the enterprise and analyzing financial statements, it is concluded that the enterprise had poorer activity indicators in 2019 and 2020, mostly due to coronavirus consequences. Accordingly, it can be assumed that the enterprise in the case study did not realize poorer results because of inadequate business process management, but because of the influence of the external factor that the enterprise management could not influence. The correlation between the process-oriented organization and fixed asset turnover ratio is negative and strong, with the correlation coefficient of -0.762. However, the correlation between the variables of process-oriented organization maturity and accounts receivable turnover ratio is positive and strong with the correlation coefficient of 0.790. This means that the increase of one variable leads to an increase in the other one. More specifically, the increase in process maturity of an enterprise leads to an increase in the accounts receivable turnover ratio, which means that accounts receivable turn into money faster. This is a positive thing for the enterprise, because it means that money returns to the enterprise faster and it has better liquidity. Based on everything abovementioned, it is concluded that the growth of process-oriented organization maturity also causes the growth of the accounts receivable turnover ratio.

CONCLUSION

The aim of this research was to analyze how the level of enterprise maturity influences the activities' performance, and determine the strength of that influence. The level of process-oriented organization maturity from the case study is measured with a Likert scale. The analysis was conducted using descriptive statistics and correlational analysis. It was determined that the

data in a set have the normal distribution, except the data from the accounts receivable turnover ratio. Correlation analysis showed there was a statistically significant association between the levels of process-oriented organization maturity and business asset turnover ratio, fixed asset turnover ratio and accounts receivable turnover ratio. Business process management inadequacy is not the cause of the poorer performance of enterprise activities from the case study, but they are caused by external factors that the enterprise management could not influence. In conclusion, the research showed that there is a negative correlation between the variables of process-oriented organization maturity and business asset turnover ratio, which indicates possible disuse of the enterprise's process potential. However, the correlation between the variables of process-oriented organization maturity and accounts receivable turnover ratio is positive, which indicates greater liquidity of the enterprise. In order to improve activity indicators, enterprise management should analyze business processes in more detail with the aim of identifying the possibilities for cutting costs and increasing total revenue. The improvement of the business asset turnover ratio in an enterprise can be achieved through sales growth, better use of business assets, cutting costs of business assets, optimizing the use of the workforce, improving inventory management and increasing process efficiency. On the other hand, the improvement of the fixed asset turnover ratio requires careful planning and business process analysis, in order to discover the best strategies for increasing efficiency of using fixed assets in production and sales. This can be achieved by better production process planning, following the efficiency of equipment use and investing in equipment modernization. The accounts receivable turnover ratio can be improved as follows: by developing an efficient payment system, better credit policy, shortening payment terms for customers, following receivables, better analysis of customer creditworthiness, developing software tools for managing receivables and improving relationships with customers. Finally, following market trends can help the enterprise to adjust to the changes in the environment, increase competitiveness and improve its activity indicators, and along with it, process maturity of the enterprise.

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SUMMARY

This research analyzes the relationship between the level of maturity of a process-oriented organization and the indicators of the company's activities. The company from the case study fulfills the main condition for this analysis, which is that the company has been process-oriented for nine years, and is suitable for analysis. The level of maturity of the process-oriented organization from the case study was measured using a Likert scale, based on questions from the questionnaire and interviews

conducted with the organization's management. The questionnaire consisted of questions with offered answers, i.e. questions with a Likert scale. The set instrument for assessing the maturity of the process organization as a construct that represented an independent variable in the research models shows that the level of maturity of the process organization from the case study in 2021 was 4.80 measured according to the Likert scale. This means that the organization that was the subject of this case study ranks relatively high in terms of process maturity. The SPSS program was used to perform the quantitative analysis, where several tests were performed to investigate the association between the level of process maturity and activity performance. The analysis began with the methods of descriptive statistics, then a correlation analysis was used, namely Spearman's correlation test to reveal the associations between the variables. To analyze the normality of data distribution, the Kolmogorov-Smirnov test and the Shapiro-Wilk test were used, based on which it is concluded that the data are of a normal or approximately normal distribution, given that the probability (Sig.) is also with the Liliefors modification Kolmogorov-Smirnov's test and Shapiro Wilk's test greater than 0.05. Correlation analysis showed that there is a statistically significant relationship between the level of maturity of a process-oriented organization and the turnover ratio of business assets, the turnover ratio of fixed assets, and the turnover ratio of accounts receivable. In conclusion, the research showed that there is a negative correlation between variables of the maturity of the process-oriented organization and the turnover rate of business assets, which indicates possible underutilization of the company's process potential. However, the correlation between variables the maturity of a process-oriented organization and the ratio of trade receivables turnover is positive, indicating higher company liquidity. For the company's management to succeed in improving activity indicators, they can access a more detailed analysis of business processes to identify opportunities for improvement and cost reduction. Accordingly, the company can improve the efficiency and productivity of its business processes, which can lead to an increase in the turnover ratio of business assets. On the other hand, quality human resource management can increase employee satisfaction and motivation for work, reduce employee turnover, improve productivity, and thus increase the turnover ratio of fixed assets. Finally, monitoring market trends can help the company to adapt to changes in the environment, increase competitiveness and improve its activity indicators..