

WHAT CAN BE EXPECTED IN CREDIT-RISK MANAGEMENT FROM NPL IN THE WESTERN BALKANS REGION IN THE FUTURE²?

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APSTRACT

This paper presents an analysis of the impact of the rate of selected parameters on the banking system performance, specifically to non-performing loans (NPLs) movements. The goal is to investigate which the most influential factors affecting the movement of NPLs in the WB countries are, given that research have pointed out the impact of macroeconomic factors on the formation of NPL rates in banking systems. The authors have added several parameters to their methodology, dividing the indicators into internal and external. On the topic of indicators that affect the performance of the banking system, but also predictions of future trends of NPLs, several hypotheses can be set, but this research will start from the hypothesis that the NPL trend can be predicted by creating predictive models which, as the basis, have a combination of macroeconomic and banking system performance indicators. In addition to scientific literature, publications of international development and those by financial institutions were used as well, and the authors also accessed the international database – CEIC data. The time aspect of the research will cover the period 2010-2019, and the prediction of NPL trends will be performed for the period 2020-2025. To determine the final model and the indicator that will most accurately describe the target variable, the Merton's model in the statistical tool R will be developed and prediction tests will be performed. The most important statistical methods: linear regression, R², ADJ R², correlation matrix. The results show that in 3 out of 5 observed indicators, the one that most influences the trend of problem loans is the unemployment rate. Based on the modelling, the outputs indicate small deviations between the NPL obtained by the model and the publicly announced NPL-trends are very well presented, and the forecast results indicate a sharpening of the NPL trend curve in the period up to 2025. The contribution of this paper is reflected in the time prediction of NPL trends which can be useful to state authorities for adequate measure implementation.

Keywords: Non-performing loans, Banking system, Western Balkans, Macroeconomic indicators, Unemployment rate, Loans, Value prediction

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INDRODUCTION

The banking system (BS) is, in all economies, one of the most important levers in achieving the desired pace and quality of economic development. The business of a modern company and the life of an individual are inextricably linked to banks and banking [1] [2], but modern banking suggests that the use of traditional banking is on constant a downward trend, with a dominant increase in risk. All this together imposes the need to better manage processes and phenomena in banks, which is inconceivable without an analysis of the performance of commercial banking [3][4]. However, despite innovation in the area of financial services, credit risk is still the most significant individual cause of bank bankruptcy [5][6]. Beck et al.[7], conclude that small companies and companies in states with adequate institutions are less likely to reach for external financing sources, notably loans from banks [8]. Therefore, the BS is the bloodstream of the economic system of the developed economy [9], because it is the banks that ensure the transfer of capital between the real sectors of the national economy and have a central role in payments [10][11][12]. A large increase in liquidity demand hit banks in March 2020. Expecting disturbances, which would prove to be a consequence of the Covid crisis, both companies and the general population have drawn funds from credit lines. Many governments around the world have implemented temporary assistance measures to support borrowers and to ensure the flow of credit into the real economy, while maintaining the resilience of banks [13][14]. Pre-crisis financial conditions did not constrain large banks' liquidity supply [14][15]. A large number of research papers indicate that the pandemic of the Covid-19 virus is thoroughly destroying the world's economies. Various macroeconomic indicators have deteriorated, especially in the field of production. Supply chains have been broken and the demand for certain products, with an increase in the amount of money in circulation (as one of the effects of state aid packages), has raised the inflation rate by over 7% [16]. Barua & Barua [17], show that the effects could negatively impact the standard of living in the long run, but also cause possible recession or depression [18][19] [20][21][22][23].

This paper starts from the general goals of the BS, which are reflected in creating opportunities for the existence and maintenance of a healthy and stable financial system, based on safe and sound operations of each bank and achieving an appropriate level of protection of the financial services users [24]. It is analyzed the impact of the rate trend of selected external (macroeconomic) and internal parameters (business performance of the bank itself) which the authors assumed could affect the business results of the BS, with a special view of NPLs, in the Western Balkan (WB). According to the World Bank [25], the countries of the WB include: Albania (ALB), Bosnia and Herzegovina (B&H), the Republic of Kosovo, Montenegro (MNE), the Republic of Northern Macedonia (NMAC) and the Republic of Serbia (RS). The self-proclaimed Republic of Kosovo was excluded from this research, due to the need to respect the Constitution of the Republic of Serbia, which declared Kosovo and Metohija as the Autonomous Province of the Republic of Serbia (Constitution of the Republic of Serbia, 2006). The time aspect of the research of banking and macroeconomic indicators in the paper will cover the period 2010-2019 (at the quarterly level). The scientific goal of the research is to show whether and to what extent the state of banking and external components affects the performance of the BS in the WB, characterized by increased competition, business diversification and liberalization of capital movements [26][27]. The research starts from the initial hypothesis (H1) which reads: "The trend of NPLs can be forecasted by creating predictive models that accept macroeconomic and BS performance indicators as components." Furthermore, we have developed hypothesis H2: "External factors, especially the unemployment rate, have an impact on the trend of NPLs."

The paper consists of four interrelated units, with introductory remarks at the beginning of the paper and concluding remarks at the end of the paper. After introductory considerations, we will create a Merton's model within the methodology, in order to check the accuracy of the NPL trend predictions. We will test the model in the third part of the paper, while the fourth part of the paper shows the results of NPL trend predictions until 2025 through the formation of two scenarios – optimistic (OP) and pessimistic (PES).

RESEARCH METHODOLOGY

The variables included in the prediction refer to internal and external factors that we considered significant for NPL trends. Among the external indicators in the analysis are: industrial production, investment rate and growth of gross domestic product (GDP), growth of GDP (nominal and real), consumer and producer price index, imports, exports and unemployment rate (UR). Furthermore, the analysis of internal factors consists of three components (3K). K1 is an indicator of capital adequacy - CAR. The second component represents the quality of assets of the banking sector through the annual change in the movement of total loans. K3 is the liquidity component - LAR. To determine the final model and indicators that will most accurately describe the target variable (NPL), data analysis methods and financial mathematics methods will be used, with an emphasis on the Merton's model and predictive tests. The model will be developed in the statistical tool R. Among the most important statistical methods that will be used in the paper are linear regression, coefficient of determination R^2 and corrected coefficient of determination ADJ R^2 , as well as correlation between variables through matrices. The contribution of this paper is reflected in the results of the prediction of NPL trends made for the period 2020-2025. It is pointed out that the International Monetary Fund /IMF/ (2020) projections (for the UR) were used as a basis for creating future trends, while the authors created an expectation of the trends of other parameters, since these items are not created by international institutions as publicly available data. Based on these projections, a predictive NPL was created. An overview of the results is shown in Table 3, where the results of the two tested scenarios are given: 1. OP: IMF-based results (2020); 2. PES: results worsened by 30%, given that the world was hit by the Covid-19 virus pandemic in 2020, and that the consequences for the world economy are expected in the coming period, based on [UNCTAD, 2020).

In this paper, the following linear model will be used: $(Z_t) = \beta_0 + \beta_1 M_{(1,t)} + \dots + \beta_i M_{(i,t)}$ where $M_{(1,t)} \dots M_{(i,t)}$ are selected macroeconomic variables, and (Z_t) the systematic risk parameter. With the assumed linear model based on Bernoulli distribution and ASR factor, the future value of (Z_t) can be projected and the future TTC PD (the average value of the probability of realization of a certain event, e.g. NPL) transformed into the future PiT PD (probability of realization of a certain event, e.g. NPL). Before performing the transformation, it should be borne in mind that the goal of the model is to determine future values:

$Y_{i,t} = R_i Z_t + 1 - R_i \varepsilon_{i,t}$ which has the following distribution:

$$Y_{i,t} \sim N(R_i Z_t, 1 - R_i^2 + R_i^2 \text{Var}(Z_t)),$$

and whose components also have a normal distribution:

$$Z_t \sim N(E Z_t, \text{Var} Z_t), \quad \varepsilon_{i,t} \sim N(0, 1).$$

The value of PiT PD at some future point t is then:

$$PD_{i,t} \text{PiT} = \text{Prob} Y_{i,t} < B_{i,t} = \Phi(B_{i,t} - R_i Z_t) / \sqrt{1 - R_i^2 + R_i^2 \text{Var}(Z_t)}.$$

On the other hand, we express the TTC PD for future data t by the following formula:

$$PD_{i,t} \text{TTC} = \text{Prob} Y_{i,t} < B_{i,t} = \Phi(B_{i,t} - E Y_{i,t}) / \sqrt{\text{Var} Y_{i,t}}.$$

By combining the above two equations, we get:

$$PD_{i,t} \text{PiT} = \Phi - 1 PD_{i,t} \text{TTC} - R_i Z_t / \sqrt{1 - R_i^2 + R_i^2 \text{Var}(Z_t)},$$

which can serve as a formula for the transformation of TTC PD into PiT PD.

After data collection, and based on the model for the variable Z , a target variable was created for all possible periods. Given that several variables were initially observed in the model, the idea was to find out which variables affect the NPLs shift in the WB the most. The aim of the modeling was to find out which variables have the greatest influence on the NPLs shift, so that the trend of NPLs in the future could be predicted, without the existence of NPL data, and with defined indicators. Given the small number of observations (on average about 50 per country), the focus was on the results obtained in the ADJ R^2 coefficient (which is used precisely in a situation where up to approximately 100 observations are available). The modeling eliminated all variables whose ADJ R^2 is less than 15%. The indicators left in the analysis, by placing variables of the same type, are put in separate groups by forming clusters. A linear regression with a significance of 5% was carried out to obtain the most appropriate results. The dependent variable Z (based on the formulas we have previously shown) was obtained for the entire observed period. By modeling it with indicators that proved to be the most important for each country, the predictive value (PD) was obtained, which is the basis for the created prediction of the NPLs trend. The results of the research for each country that followed after the variable with the highest R^2 and ADJ R^2 was selected from each cluster will be shown further on in the paper.

RESULT TESTING

In the case of ALB, the unemployment rate and total deposits collected three quarters back have been shown to have the greatest impact on NPL, while in the case of B&H, the value of total approved loans in the previous three quarters is the most significant. For MNE, the UR (again) for the year preceding the quarter for the NPL budget and the growth of total loans in the observed year proved to have the greatest impact on the trend of NPLs. In the case of RS, it turned out that the greatest impact on the trend of NPLs have the capital adequacy (CA) of two quarters backwards and the movement of investments calculated as a percentage of nominal GDP. Finally, for the prediction of NPLs in NMAC, the most significant were the UR (for the third time) and the liquidity indicator of the banking sector. Based on the above, we can see that, in as many as 3 of the 5 observed countries, one of the indicators with the greatest impact on the movements of NPLs is the UR, which supports hypothesis H2 set in the paper.

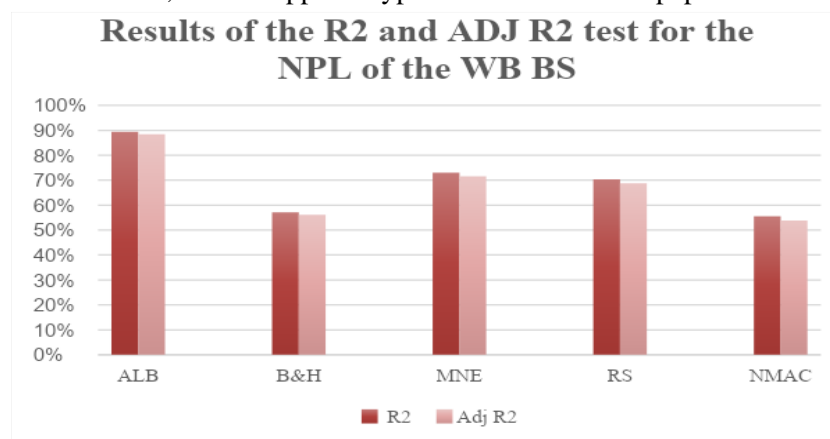


Figure 1: Results of the R2 and ADJ R2 test for the NPL of the WB BS

The results of R2 and ADJ R2 tests range from 89.4% (ALB) to 53.9% (NMAC) and suggest that the prediction of the model will be that much accurate. If we look at the results of the analysis conducted in B&H and in the other observed countries of the WB, it can be seen that the model is the most unreliable in this country. In the continuation of the research, the correlation between the target variable (NPL) and the indicators that were shown to have the greatest impact on the movement of NPL was examined. The correlation matrix is shown in Table 1.

Table 1: Correlation matrices between the target variable (NPL) and the observed variables in the BS of WB countries

Country	Variable	Z5	UR	Deposit growth LAG3
	ALB	Z5	100,00%	-78,23%
	UR	-78,23%	100,00%	40,21%
	Deposit growth LAG3	-63,77%	40,21%	100,00%
B&H	Variable	Z5	Growth of loans LAG3	
	Z5	100,00%	41,56%	
	Growth of loans LAG3	41,56%	100,00%	
MNE	Variable	Z5	UR LAG1	Growth of loans
	Z5	100,00%	-81,82%	63,14%
	UR LAG1	-81,82%	100,00%	-58,22%
	Total loans growth	63,14%	-58,22%	100,00%
RS	Variable	Z5	CAR_L2	Investments in % of nom GDP
	Z5	100,00%	68,83%	45,88%
	CAR_L2	68,83%	100,00%	35,36%
	Investments in % of GDP	45,88%	35,36%	100,00%
NMAC	Variable	Z5	UR	LAR
	Z5	100,00%	-50,34%	-68,51%
	UR	-50,34%	100,00%	50,08%
	LAR	-68,51%	50,08%	100,00%

In the previous table we can see that with the target variable Z the UR has a strong, negative correlation of -78.23%, while the relationship with the total collected deposits in the previous three years is slightly weaker (correlation coefficient /CC/ of -63.77%), in the case of the BS of ALB. The CCA between the target variable Z and the total approved loans in the previous three quarters in the case of B&H measures a relationship of 41.56%. The results of the correlation show that the predicted NPL of the BS will significantly depend on the total approved loans (correlation coefficient 63.14%). In the case of MNE, this coefficient is -81.82%, which is considered a strong correlation with the negative sign in front. In the case of the RS, it can be noticed that the variable Z, the movement of the CA ratio of banks is affected to a greater extent (CC 68.83%), while the impact of investments is somewhat smaller (CC 45.88%). On the other hand, investments (in % of nominal GDP) are correlated with CA with a weaker link of 35.36%, which means that a more drastic change in investment or CA will not affect the prediction of the model. Finally, the CC between the target variable Z and the UR in NMAC shows a negative correlation. This means that the NPL will increase if these two variables fall and vice versa.

The following is a graphical presentation of the publicly published NPL with the NPL obtained by the model used in this paper, in order to determine whether the trends are consistent or not. Slight differences in the trend were neglected in the paper, as they are a consequence of other factors that were not observed in our analysis.

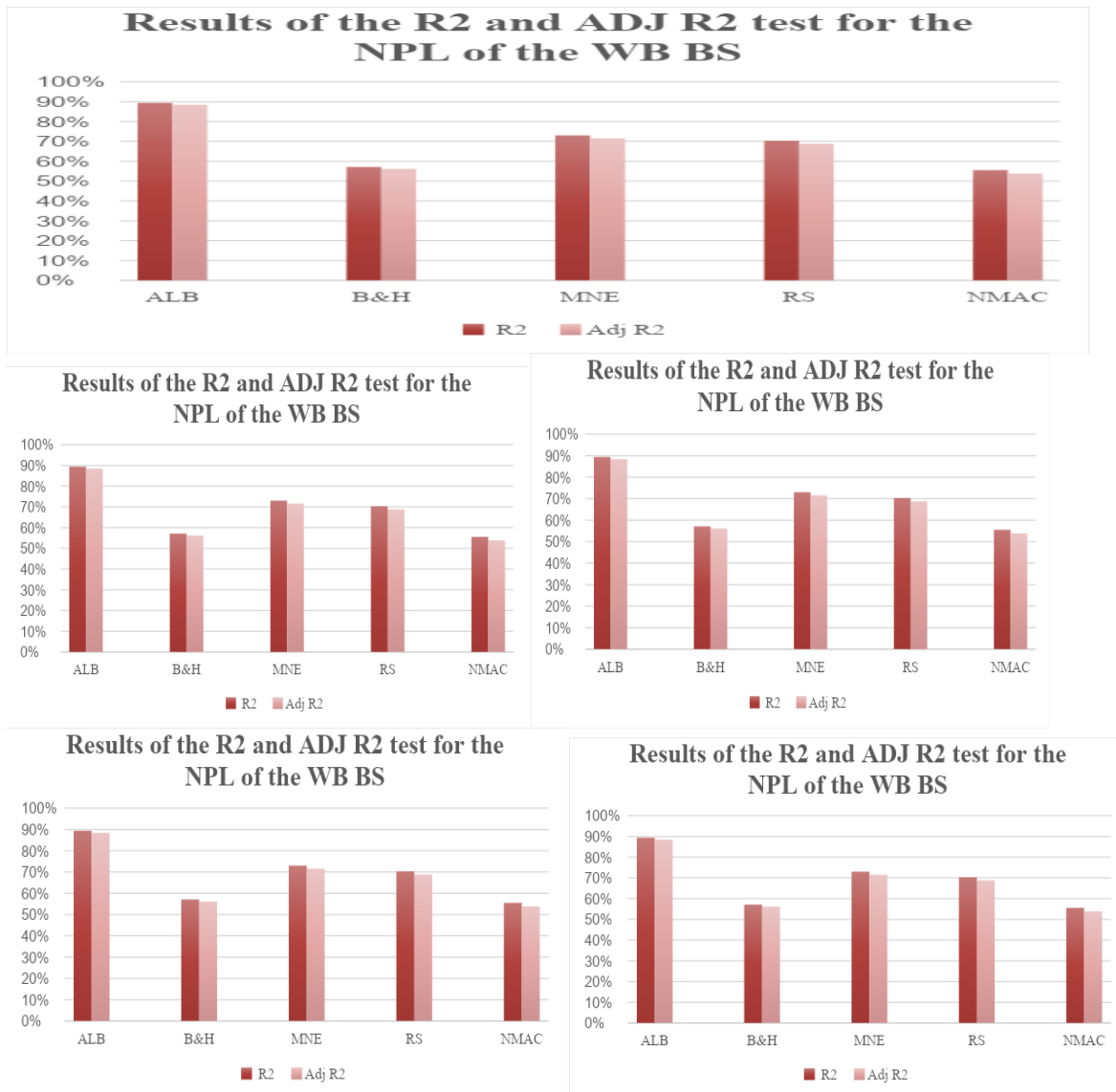


Figure 2: Publicly published and predictive NPL trends in the BS of WB countries

Historically, it can be seen from the NPL and predictive NPL columns that there are not too many discrepancies between the publicly published NPL data and the predictions of our model. The trends are also almost identical – when the NPL falls, the predictive NPL falls too and vice versa, with differences not more than 10%, except from Q4 2014 and Q4 2015 in the case of ALB. The biggest deviation and error of prediction would be at the end of 2015, when predictive NPLs increase, and real ones decrease. However, if we noticed that the NPL really increased the following year, we could conclude that the predictive NPL warned, one year in advance, of a possible jump in the real NPL, which happened in the middle of next year, 2016 [28]. The trend has been followed in the case of MNE too, which is why we can say that the model is accepted here as well. The visual representations of the trend of the official and predicted NPLs indicate that the trend is followed in the analysis of trends in NMAC, with differences in values (but not the trend), in the period 2013–2015 when predictive NPLs are lower by about 3% than they were at the official level. As a result of the modelling, the value of the projected NPL compared to those publicly announced in the B&H BS differed the most. Since the model proved to be adequate for all other observed countries, perhaps this finding can open a topic for discussion on transparent and reliable reporting of commercial banks in B&H. On the other hand, the Central Bank of B&H, as a supervisor, is obliged to check and point out irregularities in all reports it collects/receives from commercial banks, if there is any doubt as to its veracity.

PREDICTION RESULTS

Considering that all of the above is in favour of adequate interpretation of data, as well as the satisfactory quality of the obtained trend of NPLs, the prediction of NPL was made for the years 2020–2025 for the BS of each country. This also confirmed hypothesis H1, and in this regard, Table 3, which shows the results of two tested scenarios of NPL (OP and PES) is showed next.

Table 3: NPL projections by country in % (OP and PES scenario) for the period 2020–2025.

State	ALB		B&H		MNE		RS		SMAK	
Scenario	OP	PES	OP	PES	OP	PES	OP	PES	OP	PES
Year										
2020	13,90	19,25	10,70	11,47	14,14	27,97	17,67	48,42	3,03	3,73
2021	13,34	18,42	10,91	11,63	13,78	27,41	17,77	48,53	2,78	3,35
2022	12,96	17,86	11,14	11,79	13,35	26,71	17,55	48,29	2,67	3,19
2023	12,45	17,08	11,37	11,96	12,91	25,87	17,14	47,84	2,61	3,09
2024	12,37	17,01	11,58	12,11	12,56	25,24	16,92	47,61	2,58	3,05
2025	12,29	16,95	11,75	12,23	12,27	24,75	16,99	47,68	2,55	3,01

In the case of the ALB banking sector, we can expect an increase in NPLs to almost 14% (from about 10% in 2019), but with a declining trend over the observed years. Approximately the same increase is expected in the BS of B&H (from about 7% in 2019 to 10.7% in 2020), but there is a trend of NPL growth over the years, so that 2025 ends with NPL of 11.75%. A very pronounced jump in NPLs can be observed in the case of the BS of MNE from about 5% in Q1 2020 to 14.14% at the end of 2020. The jump of NPLs in this projection is also significant in the BS of the RS: from about 5% in Q2 2019 to 17.67% at the end of 2020. Only in the case of the BS of NMAC, the NPL continues to decline from 2019 (when the publicly published data is observed), until 2025 (when the projected period is over). This diversity among the rates of NPLs can perhaps be explained by the volume of lending activity and the size of the BS according to the criterion of balance sheet assets (observed by the analysed countries). In times of crisis, "bigger" does not necessarily mean "better", as the analysis shows when comparing e.g. the BS of RS (the largest, most developed, where the NPL is very much on the rise) and NMAC (not so developed, where the NPL rate is expected to continue to decline). The largest jump in the NPL rate was again observed in the BS of RS, while the smallest was present in the BS of NMAC. The 30% reduction in investments and CAR affected the increase in the NPL of the BS of the RS by more than three times. Such drastic changes in the mentioned indicators (investments in the percentage of GDP and the CA ratio) on the NPL rate can speak of how strong the influence of these two parameters is on the trend of NPLs in Serbia. Only in the BS of NMAC, the results of projections on both tested scenarios have not changed much – a jump of up to 30% is noticeable. This can be a signal of stability of the NMAC banking sector and perhaps the safest (most conservative) placement of funds for different purposes / needs of credit users (legal entities and individuals), compared to all analysed countries of the WB. Furthermore, the scenario in which the NPL rate returns to 24–28% of total loans is certainly

the most pessimistic projection that the BS of MNE can face by 2025. In the end, we would dare to say: large percentages of NPLs in total loans represent the beginning of the collapse of the entire economy of a country – so all government institutions, especially monetary and fiscal authorities, have the task to anticipate potential risks (and accompanying challenges) and if possible, mitigate their negative effects on the economy and citizens, as well as the operations of banks and non-financial companies. According to the obtained results of both scenarios (OP, PES), it can be expected a decrease in the NPL rate only during 2022, probably because of the stabilization of economic activity and world money flows.

CONCLUSION

Based on the analyses conducted in this paper, a general conclusion can be made that by following the trend of selected indicators, it can be predicted the trend of NPLs rate in the future, and thus confirm hypothesis H1. The conducted analysis included two types of indicators (external and internal, for which it was assumed to influence the movement of NPLs) to show which of the selected parameters are most important for predicting NPLs in the future when talking about the WB countries. The results of modelling show that, in as many as 3 of the 5 observed countries, one of the indicators that most influence the trend of NPLs is the UR, which goes in favor of the hypothesis H2 posed in the paper. Given that results as high as 30% are considered acceptable, our results of the R2 and AJD R2 tests can certainly be taken as acceptable since they are in the range of 53.9-89.9%. With all this in mind, it can be said that this model can provide a basis for future research and design of NPL rate trends, as well as other important parameters, since the identification of factors that are a threat, but also a chance for banking development in the WB, is crucial for the successful operation of the economy as a whole, which we also consider the most significant contribution of this paper. According to the obtained results of both scenarios (OP, PES), we can expect a decrease in the NPL rate during 2022, probably as a result of the stabilization of economic activity and world money flows. Thus, in conditions when NPLs are expected to grow, it is certain that bankers will make fewer flexible decisions in order to reduce credit risk exposure, but it is very important to recognize that crucial moment when more NPLs will return to the list of receivables and vice versa. However, the general conclusion on the possibilities of increasing the NPL rate in the WB in the period until 2025 should be a signal to all state institutions about the possible introduction of somewhat more restrictive policies, as a measure to reduce the probability of the two scenarios analysed in this paper happening.

REFERENCES

- [1] Hadzic, M. (2013). Bankarstvo. Belgrade: Univerzitet Singidunum.
- [2] Anic, A., Malovic, M., & Mistic, V. (2015). Makroekonomsko okruženje i problematični krediti - primer Srbije i Republike Češke. *Teme*, 39(1), 175-190.
- [3] Stanisic, S. (2018). Credit risk management in the banking system of Republika Srpska in crisis period. *Industrija*, 46(3), 23-45. doi: 10.5937/industrija46-17471
- [4] Kemives, A., & Barjaktarovic, L. (2021). Influence of external factors on foreign direct investment flows using the example of the Visegrad Group and Serbia. *Ekonomika preduzeća*, 69(1-2), 80-94. DOI: 10.5937/EKOPRE2102080K
- [5] Cvetinovic, M. (2009). Menadzrska ekonomija. Belgrade: Univerzitet Singidunum
- [6] Kouvelis, P., & Zhao, W. (2012). Financing the newsvendor: supplier vs. bank, and the structure of optimal trade credit contracts. *Operations Research*, 60(3), 566-580.
- [7] Beck, T., Demirgüç-Kunt, A., & Maksimovic, V. (2008). Financing patterns around the world: Are smallfirms different? *Journal of Financial Economics*, 89(3), 467-487. doi: 10.1016/j.jfineco.2007.10.005
- [8] Stoilkovic, A., & Maric, S. (2021). Financing and Success/Performance of Small Businesses in Serbia. *Management: Journal of Sustainable Business and Management Solutions in Emerging Economies*, 26(3), 13-25. doi: 10.7595/management.fon.2020.0022
- [9] OECD. (2020). The COVID-19 crisis and banking system resilience: Simulation of losses on non-performing loans and policy implications. Paris: OECD. Retrieved 01 04, 2022, from Simulation of losses on non-performing loans and policy implications: <https://www.oecd.org/daf/fin/financial-markets/COVID-19-crisis-and-banking-system-resilience.pdf>

- [10] Djekic, M., & Ristanovic, V. (2021). Osiguranje kao zajmovni sporazum za upravljanje rizikom prilikom kreditiranja preduzeca. *Trendovi u poslovanju*, 17(1/2021), 84-93
- [11] Markovic, A., Zornic, N., & Cavoski, S. (2018). Modeliranje i simulacija u finansijskom racunovodstvu. In *Finansijski menadzment, kontrola i menadzersko racunovodstvo* (pp. 267-283). Belgrade: Univerzitet u Beogradu – Fakultet organizacionih nauka.
- [12] Alihodzic, A., Halilb, E. I., & Bernab, D. (2020). The determinants of bank stability: Evidence from selected Balkan countries and Turkey. *International Review*, 1-2, 94-105.
- [13] Drehmann, M., Farag, M., Tarashev, N., & Tsatsaronis, K. (2020). Buffering Covid-19 losses - the role of prudential policy. Retrieved 05 02, 2022, from <https://ideas.repec.org/p/bis/bisblt/9.html>
- [14] Feyen, E., Alonso Gispert, T., Kliatskova, T., & Mare S., D. (2021). Financial Sector Policy Response to COVID-19 in Emerging Markets and Developing Economies. *Journal of Banking & Finance*, 133. doi: <https://doi.org/10.1016/j.jbankfin.2021.106184>
- [15] Li, L., Strahan, P., & Zhang, S. (2020). Banks as Lenders of First Resort: Evidence from the COVID-19 Crisis. *The Review of Corporate Finance Studies*, 9(3), 472-500. doi: doi.org/10.1093/rcfs/cfaa009
- [16] Narodna banka Srbije. (2022, 02). Izvestaj o inflaciji. Retrieved 05 02, 2022, from https://www.nbs.rs/export/sites/NBS_site/documents/publikacije/ioi/izvestaji/ioi_02_2022.pdf
- [17] Barua, B., & Barua, S. (2021). COVID-19 implications for banks: evidence from an emerging economy. *SN business & economics*, 1(1), 18-28. doi: doi.org/10.1007/s43546-020-00013-w
- [18] Chen, H., Qian, W., & Wen, Q. (2020, July). The impact of the COVID-19 pandemic on consumption: learning from high frequency transaction data. Retrieved from <https://deliverypdf.ssrn.com/delivery.php?ID=524086089074011088100013013084093109027008042043001033103024006095127125031026002103013039002037111125048070103009106117106088052047088034054096000015017121093031040017086087083004093027087001095114000120010112>
- [19] Coibion, O., Gorodnichenko, Y., & Weber, M. (2020). Labor markets during the covid-19 crisis: a preliminary view. Cambridge: NBER Working Paper no. w27017.
- [20] ILO. (2020, March 18). COVID-19 and the world of work: Impact and policy responses. Retrieved 01 04, 2022, from https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/briefingnote/wcms_738753.pdf
- [21] Barua, S. (2020). Understanding coronanomics: the economic implications of the coronavirus (COVID19) pandemic. MPRA, Paper No. 99693. Retrieved April 20, 2022, from <https://mpra.ub.uni-muenchen.de/99693/>
- [22] World Bank. (2020). *Global Economic Prospects*. Washington DC: World Bank. doi: doi.org/10.1596/978-1-4648-1553-9
- [23] Baldwin, R., & Mauro, B. (2020). *Economics in the time of COVID-19*. London: CEPR Press.
- [24] Bogojevic Arsic, V. (2021). Challenges of Financial Risk Management: AI Applications. *Management*, 26(3), 27-33. Retrieved 12 06, 2021, from <http://management.fon.bg.ac.rs/index.php/mng/article/view/387/235>
- [25] World Bank Group. (2019). *Western Balkans Regular Economic Report No. 16*. Retrieved 03 27, 2020, from <http://documents1.worldbank.org/curated/en/643781570478210132/pdf/Rising-Uncertainties.pdf>
- [26] Muhovic, A., & Jonel, S. (2019). Analiza i uticaj glavnih makro i mikroekonomskih faktora na rast NPL-a na finansijskim tržištima u razvoju. *Ekonomika*, 65(4), 21-30. doi: [10.5937/ekonomika1904021M](https://doi.org/10.5937/ekonomika1904021M)
- [27] Peric, M. (2020). Impact of FDI Inflow on Average Wage and Employment in Serbia. *Management*, 25(1), 13-21. doi: <https://doi.org/10.7595/management.fon.2019.0007>
- [28] Vesic, T. (2021). *Analize i perspektive razvoja bankarskog sektora u zemljama Zapadnog Balkana sa posebnim osvrtom na predviđanje kretanja problematičnih kredita* (Doctoral dissertation). Belgrade: Univerzitet Singidunum.
- [29] UNCTAD. (2020). *World Investment Report*. Retrieved 10 15, 2020, from https://unctad.org/system/files/official-document/wir2020_overview_en.pdf

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