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ACCUMULATION OF FOREIGN EXCHANGE RESERVES IN THE FUNCTION OF PREVENTING CURRENCY CRISIS

Abstrakt

The purpose of the paper is to explain the importance of foreign exchange reserves (FER) for the protection of the country from potential currency vulnerability. FER are controlled by the central monetary institution of the country - the central bank. We have witnessed many currency, financial and economic crises that have hit various parts of the world in the past three decades. If there is no appropriate and timely reaction of the central bank in crisis conditions or there is a bad choice of the exchange rate regime (ERR), it can lead to unforeseeable consequences for the economy and the entire society of the country. The paper will benefit monetary policy makers in order to review the optimality of FER and the sustainability of the current ERR.

Keywords: exchange rate regime (ERR), foreign exchange reserves (FER), central bank, currency crises, external liquidity.

JEL classification: E44, F31

AKUMULACIJA DEVIZNIH REZERVI U FUNKCIJI SPREČAVANJA VALUTNIH KRIZA

Апстракт

Сврха рада јесте да објасни важност девизних резерви за заштиту земље од потенцијалне валутне рањивости. Девизне резерве контролише централна монетарна институција земље – централна банка. Сведоци смо многих валутних, финансијских и економских криза које су погодиле разне делове света у претходне три деценије. Уколико не постоји одговарајуће и правовремено реаговање централне банке у кризним условима или постоји лош одабир режима девизног курса, то може довести до несагледивих последица по економију и читаво друштво једне земље. Рад ће користити креаторима монетарне политике у циљу преиспитивања оптималности девизних резерви и одрживости актуелног режима девизног курса.

Кључне речи: режим девизног курса, девизне резерве, централна банка, валутне кризе, екстерна ликвидност.

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Introduction

Success in achieving dynamic economic development depends on many economic and financial factors. One of the important factors is the adopted exchange rate regime (ERR) and policy. The ERR affects many monetary and economic indicators such as price stability, the level of the money supply, employment and economic growth (Vujanić, Gligorić & Žarković, 2019). The stability of the national currency and resistance to currency crises are a key element of country's economic development strategy. In the last three decades, many countries have faced the consequences of a currency crisis, which is easily transferred to the economy and country's economic system. It is an indisputable fact that financial and currency crises do not bypass any country; they occur in developed and developing countries; small and large countries, regardless of the choice of ERR (Reinhart & Rogoff, 2010). They can be caused by internal factors, problems in the public or private sector, external shocks, speculation on the foreign exchange market, but also by irrational factors such as negative investor expectations and market panic.

Economic and financial crises are a threat to all countries, whether they lead an adequate economic policy or not (Marjanović & Marković, 2019). This is because nowadays crises are quickly transferred from country to country, bearing in mind the financial and economic connection of countries. Given the degree of globalization, countries are highly interdependent (Đokić, 2022). Besides, financial crises can start from both the public and the private sector. Either way, financial crises destroy the economic and political system, and affect losses in the real sector due to the accompanying difficult financing. Therefore, such crises cause many costs, increase the country's public debt and cause systemic socio-economic disturbances. This is the reason why this study aims to show the basic factors of the choice and sustainability of the applied ERR, the function of foreign exchange reserves (FER), as well as the reasons why in modern conditions there is a considerable increase in FER in the world.

1. On the determinants of the choice of ERR

The choice of the ERR is one of the most important issues of a country's macroeconomic policy. When selecting the ERR, at least two facts must be taken into account:

- a regime chosen once does not mean that the decision should not be reconsidered over time,
- the decision is made in accordance with the economic structure, macroeconomic trends in the specific country and the characteristics of the external environment.

The starting point for choosing a regime is the understanding of the hypothesis of the impossible trinity, which is also known in the literature as the "monetary trilemma" or the "open macroeconomic trilemma" (Aizenman, 2019). In fact, there are three theoretical goals in monetary policy: monetary independence, stability of the exchange rate, and full financial integration (Frankel, 1999). Complete financial integration is unattainable under conditions of perfect capital mobility, so, in practice, a country can choose between exchange rate stability that ensures a fixed exchange rate and monetary

independence, on the other hand. Monetary independence implies that the country can conduct its monetary policy without restrictions, and this provides it with a flexible ERR. However, as there are different modalities with more or less flexibility between fixed and floating exchange rates, the practical consideration of the monetary trilemma is called into question (Table 1).

Table 1: Classification of exchange rates according to the International Monetary Fund

Hard peg	Soft peg	Floating	Residual
<i>Exchange arrangements with no separate legal tender - Monetary union</i>	<i>Conventional pegged arrangement</i>	<i>Floating exchange rate</i>	<i>Other managed exchange rate arrangement</i>
<i>Currency board arrangement</i>	<i>Pegged exchange rate within horizontal bands</i>	<i>Free floating exchange rate</i>	
	<i>Stabilized arrangement</i>		
	<i>Crawling peg</i>		
	<i>Crawl-like arrangement</i>		

Source: International Monetary Fund, 2023

According to the latest International Monetary Fund Report for 2022, the largest number of countries opted for soft exchange rates (soft pegs) (46.9%); 34% of member states apply floating exchange rates, 13.4% adopt and implement fixed regimes (hard pegs), while the remaining 5.7% have other (residual) regimes of exchange rates (International Monetary Fund, 2023).

As a rule, large open economies and highly developed economies choose a floating exchange rate because in this way they can achieve favourable rates of economic growth and accelerated economic development. They have a developed financial market, which gives them the ability to adapt more quickly to external circumstances and maintain macroeconomic balance. On the other hand, in practice, smaller and developing countries most often choose a fixed ERR. It helps them more easily overcome the consequences of a bad economic structure and high inflation and serves as a nominal anchor until the moment when the benefits outweigh the costs. That way they can avoid the so-called “fear of floating” (Calvo & Reinhart, 2002) bearing in mind the inflexibility of wages and prices, as well as the high import dependence that are characteristic of this group of countries. Weak institutions, an underdeveloped foreign exchange market and poor economic conditions are additional reasons why a fixed exchange rate is appropriate for underdeveloped countries. A fixed exchange rate can “discipline” economic policymakers and increase the credibility of monetary policy.

It is important to know that a certain regime will not have the same effects in all countries. In other words, the theoretical advantages and disadvantages of a particular ERR may not be reflected in the practices of some countries. Natakani (2018) in his study assesses that countries with fixed exchange rates are less prone to currency crises. However, there are also different understandings according to which the floating exchange rate protects against the overvaluation of the national currency and the depletion of FER of the central bank in order to defend the exchange rate (Abubakar, Utari & Azwar, 2020). Therefore, the decision on the choice of regime is very complex and requires the

consideration of many factors and the involvement of all relevant actors at the macro level. The ultimate goal is that the selected exchange rate can ensure macroeconomic balance in the medium term.

2. The role of FER as an instrument of the central bank

FER are one of the basic instruments of central banks for operations on the foreign exchange market (Martin, 2020). They are the guarantor of external liquidity and serve in the first line of defence of the external balance. Bošnjak, Bilas & Kordić (2020) point out that FER are an indicator of the strength of the national economy to resist an exogenous shock. They are most often used to prevent major disorders caused by external factors. Their goal is to maintain confidence in the national currency, increase resistance to the economic crisis and preserve the entire financial system. FER are used in all countries regardless of the choice of ERR. In the fixed ERR, their use is mandatory in order to defend the established level, while in the floating ERR, they are occasionally used to prevent a significant outflow of capital and to defend against potential currency crises, but also excessive strengthening of the currency, which causes uncompetitive exports. They especially play a role in small open economies due to the nature (volatility) of short-term capital, which is often represented in developing countries.

In the scientific and professional literature, the research community classifies three basic functions of FER (Gray, 2011; Agénor, Alper & da Silva, 2015):

- microprudential function (related to preservation of external solvency in cases of accelerated capital outflow from the country),
- function of monetary control (implies the use of various monetary aggregates), and
- liquidity management function (refers to the sterilization of FER in order to curb inflation in cases of massive capital inflow).

Financial and currency crises can arise as a result of real events, but also the opinion that certain unexpected situations will occur. Thus, they are the result of rational expectations, but also the panic of investors who can massively withdraw their investments. A particularly bad situation is when there is panic among depositors, because a sudden withdrawal of deposits can collapse the country's monetary and financial system. Currency crises leave behind enormous economic losses: decline in economic activity, investor distrust, withdrawal of capital from the country. Russia, the countries of Latin America and East Asian countries are the countries that faced the devastating consequences of currency crises. It is obvious that no country can be completely immune to currency crises. Therefore, reducing the risk of external vulnerability and creating confidence in the currency should be the basic imperative of holding FER. Dabrowski (2021) emphasizes that FER are a key instrument in the management of currency crises under the jurisdiction of the central bank, as the central institution of the country's monetary system. That is why it is important that FER are maintained at an optimal level.

In the literature, there are several indicators for evaluation the optimality of FER that can be divided into two groups (Marković & Marjanović, 2021):

- indicators of external liquidity (the ratio of FER and short-term external debt, coverage of imports with FER, and coverage of FER with gross domestic product),

- indicators of exposure to financial risk (ratio of FER and primary money; ratio of FER and money supply M1) (Table 2).

Table 2: Criteria for the optimality of the FER level

Indicator group	Indicator	Preferred value
Indicators of external liquidity	FER/Short-term foreign debt	minimum 100%
	FER/Average monthly imports	from 3 to 6 months of average import value
	FER/Gross domestic product	as high as possible
Indicators of exposure to financial risk	FER/Primary money	more than 100%
	FER/Money supply M1	more than 100%

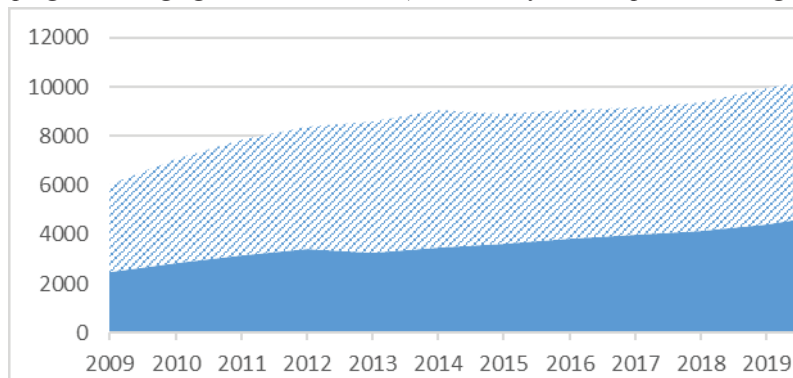
Source: Marković & Marjanović, 2021

3. Tendency of accumulation of FER in modern (crisis) conditions

Recently, there is a practice of increasing FER in the world, both in developed and underdeveloped economies. International disruptions in the flow of products, services and capital are the main reason for the rapid increase in FER at the international level (Kovačević, 2021). A drastic growth of FER in the world has been recorded since the nineties of the twentieth century, in the sense that countries held FER that corresponded to the value of eight months' worth of imports (Rodrik, 2006; Lee & Yoon, 2020), which is significantly higher than the optimal level. In that period, crises appeared in many countries: Brazil, Mexico, Argentina, Russia, as well as hints of the East Asian currency and financial crisis. Financial globalization and liberalization made it easy to transfer financial disturbances from country to country, so that economies wanted to provide increased protection, security and external liquidity by increasing FER.

Chart 1 aims to show the movement and allocation of FER in the world, taking into account the division of countries into developed (advanced) economies and developing countries and emerging (market) economies.

Chart 1: Regional distribution of FER in the world – advanced (developed) economies and developing and emerging market economies (in billions of SDRs - special drawing rights)



Source: Author's presentation based on data from the International Monetary Fund (2022)

It is noticeable that developing countries have more FER (including monetary gold) than advanced economies. However, the average growth of FER in developed countries for the period from 2009 to 2021 was 6.75%, which is higher than the average growth of FER in developing economies where the same rate was 4.49%. Also, advanced economies recorded a growth of FER of 116% in the period of analysis, while the growth of FER in emerging market economies and developing countries was lower and amounted to 66%.

Taught by the experience of the world economic (financial) crisis of 2007-2008, almost all countries accumulated the increasing levels of FER in order to avoid the negative consequences of a sudden capital outflow, such as a fall in gross domestic product, an increase in poverty and an increase in public debt (Abdelsalam & Abdel-Latif, 2020). A high amount of foreign reserves was expected to calm the financial market from disturbances and prevent currency crises thanks to increased external liquidity in that case (Céspedes & Chang, 2020). In a theoretical sense, countries with higher amounts of FER at their disposal can more easily overcome or prevent a crisis. But, FER accumulation can create a gap between the money supply and goods on the market, which usually causes inflation (Polterovich & Popov, 2003). Due to the danger of overheating of the domestic economy, the question of the optimality of the FER level has arisen. In addition, Rodrik (2006) believes that FER carry with them opportunity costs of holding, and that is why the upper and lower thresholds of the FER (zone of optimality) are determined in the literature. Amounts of FER depend on exports, imports, exchange rate movements in the previous period, inflation rate and inflationary expectations (Sanusi et al., 2019).

Conclusion

Financial stability and the possible appearance of a currency crisis depend on the adequacy of the selection of ERR and the level (optimality) of FER. First, the chosen ERR must be adequate in the medium term in terms of ensuring a low inflation rate and foreign trade balance. The decision on the choice is made in accordance with the current characteristics, but also projections of certain economic parameters, monetary policy objectives and characteristics of the external environment. In a narrower sense, the holders of monetary policy in the country can choose between a fixed and a floating exchange rate (the so-called bipolar view). The fixed ERR undoubtedly ensures the stability of the exchange rate if the FER are sufficient to avoid the pressure on the devaluation of the national currency and the rupture of the applied regime. On the other hand, a flexible exchange rate makes it possible to achieve the goal of monetary independence, but only in cases of developed market economies. However, it should be noted that the bipolar point of view is valid only in a theoretical sense, because between a fixed and a floating exchange rate, there are a number of other regimes that countries massively opt for.

The central bank, as the central monetary authority, must lead such a policy of FER that will ensure financial and economic stability. Therefore, it must keep the amounts of FER in accordance with the defined criteria of their optimality. Despite higher FER in developing countries compared to advanced economies, the following facts should be taken into account:

- FER in advanced economies (both in absolute and relative amounts) grew faster in the observed period (2009-2021),

- during the pandemic (2020 and 2021), the growth rates of FER were significantly higher in developed countries and amounted to close to 10%.

If the central bank is not successful in implementing its own policy, there may be a currency crisis that spreads rapidly and affects all parts of the economy. In addition, currency crises are quickly transmitted to neighbouring markets, so the management of foreign exchange policy and FER can become a global problem. An adequate choice of measures and the expediency of policy in crisis conditions will depend on a proper understanding of the essence, causes and nature of the problem of currency crises.

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References

- Abdelsalam, M. A. M., & Abdel-Latif, H. (2020). An optimal early warning system for currency crises under model uncertainty. *Central Bank Review*, 20(3), 99–107. <https://doi.org/10.1016/j.cbrev.2020.03.002>
- Abubakar, A., Utari, G. D., & Azwar, P. (2020). Early Warning Indicators and Optimal Policies for Mitigating Economic Crises: Evidence from Meta-Analysis. *Buletin Ekonomi Moneter Dan Perbankan*, 23(2), 269–294. <https://doi.org/10.21098/bemp.v23i1.1421>
- Agénor, P. R., Alper, K., & da Silva, L. P. (2015). External shocks, financial volatility and reserve requirements in an open economy. *Discussion Paper Series*. Centre for Growth and Business Cycle Research, Economic Studies, University of Manchester, Manchester, M13 9PL, UK. No. 203. <https://doi.org/10.1016/j.jimonfin.2018.01.003>
- Aizenman, J. (2019). International Reserves, Exchange Rates, and Monetary Policy: From the Trilemma to the Quadrilemma. In *Oxford Research Encyclopedia of Economics and Finance*. <https://doi.org/10.1093/acrefore/9780190625979.013.313>
- Bošnjak, M., Bilas, V., & Kordić, G. (2020). Determinants of foreign exchange reserves in Serbia and North Macedonia. *Economic Annals*, 65(226), 103–120. <https://doi.org/10.2298/EKA2026103B>
- Calvo, G. A., & Reinhart, C. M. (2002). Fear of floating. *The Quarterly Journal of Economics*, 117(2), 379–408. <https://doi.org/10.1162/003355302753650274>
- Céspedes, L. F., & Chang, R. (2020). *Optimal foreign reserves and central bank policy under financial stress* (No. w27923). National Bureau of Economic Research. DOI 10.3386/w27923
- Dąbrowski, M. A. (2021). A novel approach to the estimation of an actively managed component of foreign exchange reserves. *Economic Modelling*, 96, 83–95. <https://doi.org/10.1016/j.econmod.2020.12.019>

- Dokić, M. (2022). World economy in the time of pandemic: Consequences of COVID-19 on world output, trade and employment. *Ekonomika održivog razvoja/ Economics of Sustainable Development*, 6(1), 57–72. <https://doi.org/10.5937/ESD2201057D>
- Frankel, J. (1999). No single currency regime is right for all countries at all times. https://www.nber.org/system/files/working_papers/w7338/w7338.pdf
- Gray, S. (2011). *Central Bank Balances and Reserve Requirements*. IMF Working Paper No. 11/36, International Monetary Fund. <https://ssrn.com/abstract=1767804>
- International Monetary Fund (2022). Retrieved from: <https://www.imf.org/external/pubs/ft/ar/2022/downloads/appendix.pdf> Assessed: (03/08/2023)
- International Monetary Fund (2023). *Annual Report on Exchange Arrangements and Exchange Restrictions 2012*. Retrieved from: <https://www.imf.org/en/Publications/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions/Issues/2023/07/26/Annual-Report-on-Exchange-Arrangements-and-Exchange-Restrictions-2022-530144> Assessed: (03/08/2023)
- Kovačević, R. (2021). Adekvatnost deviznih rezervi Republike Srbije i faktori koji utiču na njihovo formiranje. [In English: Serbia's foreign exchange reserve adequacy and the factors influencing their accumulation] *Ekonomski horizonti*, 23(1), 33–53.
- Lee, Y., & Yoon, S. M. (2020). Relationship between International Reserves and FX Rate Movements. *Sustainability*, 12(17), 6961. <https://doi.org/10.3390/su12176961>
- Marjanović, I., & Marković, M. (2019). Determinants of currency crises in the Republic of Serbia. *Zbornik radova Ekonomskog fakulteta u Rijeci: Časopis za ekonomsku teoriju i praksu/ Proceedings of Rijeka Faculty of Economics: Journal of Economics and Business*. 37(1), 191–212. <https://doi.org/10.18045/zbfri.2019.1.191>
- Marković, M., & Marjanović, I. (2021). *Одрживост режима девизног курса и валутне кризе у Републици Србији [In English: The sustainability of the exchange rate regime and currency crisis in the Republic of Serbia]*. Niš: Society of Economists „Ekonomika“
- Martin, V. (2020). Intervention Strategies in Foreign Exchange Market. *Ekonomске teme/ Economic Themes*, 58(3), 381–399. <https://doi.org/10.2478/ethemes-2020-0022>
- Nakatani, R. (2018). Real and financial shocks, exchange rate regimes and the probability of a currency crisis. *Journal of Policy Modeling*, 40(1), 60–73. <https://doi.org/10.1016/j.jpolmod.2017.10.004>
- Polterovich, V., & Popov, V. (2003). *Accumulation of foreign exchange reserves and long term growth*. NES Working Paper. <https://dx.doi.org/10.2139/ssrn.1751866>
- Reinhart, C. M., & Rogoff, K. S. (2010). Growth in a Time of Debt. *American economic review*, 100(2), 573–578. DOI: 10.1257/aer.100.2.573
- Rodrik, D. (2006). The social cost of foreign exchange reserves. *International Economic Journal*, 20(3), 253–266. <https://doi.org/10.1080/10168730600879331>

- Sanusi, K. A., Meyer, D. F., & Hassan, A. S. (2019). An investigation of the determinants of foreign exchange reserves in Southern African countries. *Journal of International Studies*, 12(2), 201–212. doi:10.14254/2071-8330.2019/12-2/12
- Vujanić, V., Gligorić, D., & Žarković, N. (2019). The Contribution of Monetary Policy to Mitigating the Consequences of the World Economic Crisis in Poland. *Ekonomске teme/ Economic Themes*, 57(3), 329–350. <https://doi.org/10.2478/ethemes-2019-0019>