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OPTIMAL LEVEL OF FOREIGN RESERVES – EXAMPLE OF BOSNIA AND HERZEGOVINA

ОПТИМАЛНЕ ДЕВИЗНЕ РЕЗЕРВЕ – ПРИМЈЕР БОСНЕ И ХЕРЦЕГОВИНЕ

Summary: *The paper points to the conceptual definition of foreign exchange reserves, the role, importance and objectives for holding foreign exchange reserves as well as evaluating the required amount of foreign exchange reserves, or adequacy of foreign exchange reserves. Foreign exchange reserves are important assets in each country and they are significantly affected by monetary policy, exchange rate policy or regulation and external instability and the impact of the crisis that may come from the environment. This paper presents a simple way of estimates of adequacy and optimality of foreign exchange reserves, which are basis for the analysis of foreign exchange reserves, as well as in the construction of statistical and mathematical models that detail the optimal level of international reserves. Special review was paid to the assessment of the adequacy of foreign exchange reserves of Bosnia and Herzegovina, and the Central Bank of Bosnia and Herzegovina.*

Keywords: *foreign exchange reserves, optimal level of foreign reserves, the central bank*

JEL clasiffication: *E51*

Резиме: *У раду се указује на појмовно одређење девизних резерви, улогу, значај и циљеве због којих се девизне резерве држе као и оцјену потребне количине девизних резервих, односно адекватност девизних резерви. Девизне резерве су значајна актива у свакој земљи и њима се значајно утиче на монетарну политику, политику девизног курса или и регулацију спољних нестабилности и удара кризе који могу долазити из окружења. У раду је приказан једноставан начин оцјене адекватности, оптималности девизних резерви, од којег се полази у анализама девизних резерви, али и у изградњи статистичких и математичких модела који детаљније одређују оптималан ниво девизних резерви. Посебан осврт је дат на оцјену адекватности девизних резерви Босне и Херцеговине, односно Централне банке Босне и Херцеговине.*

Кључне ријечи: *Девизне резерве, оптималне девизне резерве, централна банка.*

ЈЕЛ класификација*:E51*

1. INTRODUCTION

The Central Bank has supreme monetary authority in a country and is the only one that has a monopoly on the printing of money. Its authority includes conducting monitory policy and many other activities that result from these activities. One of the most important tasks of a central bank is to manage foreign reserves.

Foreign reserves are defined in different ways. There is no single universally accepted definition of this term. Identification of foreign reserves mainly refers to the definition given by the International Monetary Fund. According to this source, the foreign exchange reserves means assets, assets denominated in foreign currency, which is available at any time and controlled by the monetary authorities of the countries under consideration, mostly by the central bank.

Foreign reserves are very important macroeconomic categories, especially in the underdeveloped and developing countries, because with the strengthening of these categories of foreign reserves, confidence in the financial stability of the country becomes larger. Given that the underdeveloped countries and developing countries are exposed to external shocks, it is useful that there is a certain “pillar” (foreign exchange reserves) which will defend the macroeconomic position of the country.

This study analyzes the key concepts of foreign exchange reserves, assesses their optimization and adequacy, where the emphasis is placed on the foreign exchange reserves of Bosnia and Herzegovina. Specifically, the paper points to the key fundamentals and explanations of foreign exchange reserves, the assessment of their size, the reasons and the need for existence and holding of foreign exchange reserves and foreign currency reserves optimality analysis of Bosnia and Herzegovina.

2. DEFINITION, OWNERSHIP AND THE IMPORTANCE OF FOREIGN RESERVES

2.1. Definition of Foreign Reserves

As mentioned in the introduction, to this day a single definition of foreign exchange reserves has not been identified and commonly referred to and used is the definition given by the International Monetary Fund.

Foreign exchange reserves are external resources that are available and controlled by monetary authorities for direct financing of external imbalances, balance of payments, for indirectly regulating the magnitude of such irregularities through intervention in the currency market with the aim of acting on the exchange rate, and for other purposes (IMF 2013).

Foreign exchange reserves mostly consist of readily marketable foreign assets, in terms of receivables denominated in foreign convertible currencies. Foreign exchange reserves could include deposits in foreign banks, foreign securities, monetary gold, special drawing rights, reserve position in the International Monetary Fund. Foreign exchange reserves are calculated as a proportion of national wealth and have great importance in countries which apply a fixed exchange rate and in countries who want to avoid costly currency adjustments. When monetary authorities acquire foreign currency reserves, they usually sterilize the effects of the domestic monetary base by increasing the sum of the domestic currency (a term known as “sterilization bonds”). If a central bank makes sterilizing it effectively reduces net assets. As a result, foreign exchange reserves of most countries do not represent net national assets. This is because the foreign currency reserves denominate in foreign currencies and are usually held in the form of foreign government bonds, and holding foreign exchange reserves exposes the country to interest rate and foreign exchange risk (Dominguez et al. 2010). The central bank, in accordance with its framework and possibilities, decides how to invest in foreign exchange reserves as well as a way of managing this asset.

2.2. Ownership of Foreign Exchange Reserves – Government or Central Bank

The issue of ownership of foreign exchange reserves has always been a topic and subject of numerous debates. True and accurate answer to the question - "Who is the owner of the foreign exchange reserves?" – does not actually exist. In most countries, foreign reserves are owned by the central bank, as are the balance sheets of the central bank and the ultimate decisions on the management of foreign exchange reserves of the central bank are brought within its management structure. However, there are several examples that are contrary to the above. In some countries (UK, Japan) foreign exchange reserves were formally owned by the government, the state, and the decisions of their governing were undertaken by the government (usually by the Ministry of Finance).

A country will decide between two approaches adopted on the basis of a number of factors. Perhaps the most important one that assumes that if there is already a certain structure and if it already works well, there is little reason for any changes. However, it is important to mention the following factors that have an impact on this decision (Detemple and Rindisbacher 2011):

- It is necessary to assess whether the foreign exchange reserves have a role in maintaining the local currency or similar issues in this domain - If they have, it is more logical that they are in balance sheets of central bank;
- Identify whether the foreign exchange reserves primarily or predominantly are used for managing the monetary policy of the country - If answer to this question is affirmative,

again it is more logical that foreign exchange reserves are in balance sheets of central bank;
- To assess whether the foreign exchange reserves are primarily used as protection against the risks in terms of hedging obligations of the Government - If yes, the government should consider the option of owning foreign currency reserves;
- To analyze how the central bank is funded - many central banks will see the proceeds of foreign exchange reserves as a basic element for the financing of their operating costs.

In order to give a statement in terms of having foreign exchange reserves, it is useful to assume that whoever manages the foreign reserves is generally their owner and it is often the central bank – it either directly manages foreign reserves or acts as an agent of the Government. Anyone who formally owns the foreign exchange reserves, is treated as their owner by international monetary institutions such as the IMF, or the system of international currency reserves. An independent central bank makes the final decision on domestic currency (exchange rate policy, significant intervention, the union with the other currency or dollarization system[1]), whereby this decision will, of course, have consequences for the management of foreign exchange reserves. In such cases, the precise legal definition of ownership of reserves is less important than the need of coordinated action by governments and central bank.

2.3. Importance of Foreign Reserves

Importance of foreign exchange reserves is arising from their purpose, or the purpose of their use. In this content it is useful to point out the following possibilities for using these assets (Borio et al. 2008):

- Intervention in the foreign exchange market, the impact on the movement of the exchange rate of the domestic currency, the impact of maintenance or market conditions;
- Payment for goods and services of the country, especially in situations where it is difficult to operate in the field of external financing;
- Approval, or providing emergency liquidity support sectors of the economy of the country, mostly the banking sector;
- Support or strengthen investor confidence in the country's ability to meet its foreign currency obligations, thereby limiting the likelihood of a currency crisis, while reducing the costs of external financing;
- The need to settle the obligation or the payment of the government - in the wider context it can be viewed as operations management of external debt of the country;
- Support the monetary policy of the country, the management of liquidity through currency swaps, the effective implementation of foreign currency claims.

The same attitudes about the importance of foreign exchange reserves can be found in the Guidelines and the International Monetary Fund (IMF 2013), except that the Guidance adds that the foreign exchange reserves can be used in the event of national disasters and emergencies. Balancing between above reasons for holding foreign reserves depends on the specific factors that are related to each state. It is important to observe the exchange rate regime, a country's creditworthiness, the degree of vulnerability of the economy to external shocks to the country, as well as domestic instruments available to the monetary policy of the country.

[1] The essence of this model is that in any country, in both formal and informal transactions, foreign currency is applicable as legal tender. The fact is that the most widespread currency, which is used in the system of dollarization are the dollar and euro. Today, there are relatively few countries that are officially in dollarized system.

3. MANAGEMENT OF FOREIGN RESERVES AND OPTIMAL LEVEL OF INTERNATIOANL RESERVES

3.1. Foreign Reserves Management

Management of foreign exchange reserves is a process that ensures that an adequate level of foreign assets of the public sector is available and controlled by monetary authorities for the execution of the objectives of the country or the government (Nugée 2009). Basically, it is a set of procedures, techniques, management and control aimed at reaching such a size and structure of foreign exchange reserves, which will allow the maximum yield with acceptable levels of risk, i.e., the maximum return on funds invested in foreign exchange reserves at an acceptable level of risk[2]. Efficient management of foreign reserves, taking into account their importance and necessity, increases the resistance of the economy or the state or region to external shocks. The importance of adequate foreign exchange reserve management is especially obvious in the experience of some countries in which the risk management system of foreign reserves worked constraining the government to effectively respond to the emergence and development of the financial crisis. In addition, inadequate risk management practices and foreign exchange reserves may have high financial costs and can significantly increase the reputation risk[3].

The management of foreign reserves should ensure:

- An adequate level of foreign reserves, which is necessary for the realization of the set goals,
- Appropriate control of liquidity risk, market risk, credit risk,
- Realization of a certain level of yield, which is in accordance with the required limits of risk.

Management of foreign exchange reserve management is a segment of economic policy which is closely related to the system of monetary policy and the objectives to be achieved. In order to maintain adequate availability of foreign reserves, it is important to maintain optimal amount of reserves, which will also be invested appropriately. Under appropriate way it implies that reserves are available as needed.

3.2. The Objectives of Management of Foreign Reserves

Although almost all states possess foreign currency reserves, the reasons and goals of their holding are different. Before the establishment of a strategy to hold and manage foreign reserves, the government must identify and clearly define the reasons why to hold foreign exchange reserves, and the objectives of holding and managing of foreign reserves. Only in this case can it determine and consider optimal sum of foreign exchange reserves, their financing and investment. Some of the main reasons for holding foreign exchange reserves are explained below. Foreign exchange reserves are sometimes kept as a *formal support for the local (domestic) currency*. This is the traditional reason for holding or use of foreign exchange reserves, especially when it comes to gold reserves. The reason for using foreign exchange reserves was at its peak during the gold standard[4] after World War II as well as the system Bretton Woods[5].

After the collapse of the Bretton Woods system the role of the foreign exchange reserves in the support system to the local currency has been gradually reducing, although the care and handling of gold has never completely disappeared. Gold has been used for a long time, after the collapse of the Bretton Woods system, for the strengthening of the national currency and some countries still adhere

[2] Foreign reserves are exposed to financial risks - market, interest rate risk, currency risk

[3] Reputation risk is the risk of loss of confidence in the integrity of the institution resulting from adverse public opinion about the business practices of the observed institutions

[4] The gold standard is a system in which the currency had backing in gold. Specifically, the dollar had a cover in gold, while other currencies were tied to the dollar and thus indirectly have coverage for this noble metal.

[5] Bretton Woods is the name for a system of monetary policy, international monetary policy, or rules within whose framework financial and commercial relations have taken place between the powerful industrial countries for several decades after World War II

to this system[6]. In any case, for most of today's countries holding foreign exchange reserves as a formal support for the local currency is no longer a primary role[7].

It is often the case that the foreign reserves are used as an *instrument of monetary policy in exchange rate policy*. This concept is most noticeable in the case when the country implements a fixed exchange rate and wants to be able to act on the domestic currency market and maintains a fixed exchange rate. In addition, the country can use the fixed exchange rate to act on monetary policy by offering domestic currency market, or the same redeemed in exchange for foreign currency. This will affect the domestic money market and the interest rate in the country. This concept is applicable in those countries that do not yet have fully developed domestic market. In addition, even those countries whose market is fully developed and that have adopted flexible "floating" exchange rate of the domestic currency, can intervene with the aim of directing the course of action and on the domestic currency. Under the current circumstances there are few countries that have decided to intervene in the foreign exchange market completely (free trade their currencies), where even these countries hold foreign exchange reserves as an option for the intervention or control of the trends of exchange rates or changes in policies.

The third reason for holding foreign reserves is *providing funds to service foreign currency obligations*. At maturity or when servicing foreign debts or payments, it is necessary to possess foreign currency. While it would be possible to meet this obligation by converting currency at the foreign exchange market (by selling domestic currency) in the case when the need for foreign currency, many countries do not practice this way for several reasons (Nugée 2009):

- Foreign exchange market, and the exchange rate may be undesirable at the moment when the foreign currency is necessary;
- Foreign exchange transactions, in case of large sums, can be devastating and can disturb the functioning of the foreign exchange market;
- There is a significant currency risk that can threaten the portfolio of foreign exchange reserves;
- This approach has a negative impact on the rating agencies[8], reduces confidence in the country as the issuer of the bonds, as lender, and increases the cost of borrowing in foreign currencies.

In accordance with the foregoing reasons, most countries mainly use part of the reserves to service at least part of obligations in foreign currency.

Foreign exchange reserves can also be used *as a source of payment of the foreign state spending*. Many countries, especially those that are faced with foreign accounts and obligations and they can plan to fund them by foreign exchange reserves. This is the case when there are irregular inflows and outflows from abroad as well as in the case of seasonal fluctuations.

Finally, foreign reserves can be kept as an *investment fund*, primarily with a view to realizing a profit. Most of the countries do not consider this concept reasonable because they assume that foreign exchange reserves have another role, in terms of protection and monetary stability. On the other hand, there are considerations that try to justify holding of foreign reserves for profit gain. However, in some countries, this concept may be a logical policy for the following reasons (Nugée 2009):

- When the local economy cannot absorb more consumption without overheating;
- In the event that a fall in profits jeopardizes the economy of the country;
- To make preparations for an uncertain future (e.g. if natural resources are disappearing);
- To diversify the asset base of small countries.

Identifying the objectives of holding foreign exchange reserves, management of foreign exchange reserves and foreign currency reserves structure are just some of the global frameworks of foreign exchange reserves.

Policy makers, planning and directing the concepts of foreign exchange reserve management, need to draw up a list which will identify the reasons for holding foreign exchange reserves.

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[6] It is known that the BRIC countries (Brazil, Russia, India, China) are buying gold to strengthen their currencies
[7] Unless it is not a country with a fixed exchange rate that maintained the exchange rate is through foreign exchange reserves
[8] Thoughts on the credit rating of a particular state by rating agencies, global rating agency

3.3. Optimal Level of Foreign Reserves

In developing countries and small economies, there are often debates about the foreign exchange reserves and their size. It often points out that there are not enough foreign exchange reserves, or claims that the sum of foreign exchange reserves should be higher. In these countries there is a public perception that "good foreign exchange reserves are good and that more foreign currency reserves is better", and the authorities in those countries will never claim to have excessive sums of foreign currency reserves, given that the market can dramatically expose the country to numerous risks if it has too few reserves. In any case, clearly and specifically defining the necessary sums of foreign exchange reserves is difficult to determine.

Any debate about the optimal size of foreign exchange reserves involves two key elements. The first is the correct identification of the use of foreign exchange reserves and to determine the minimum reserves required to meet the identified needs. Before evaluating these two elements, it is impossible to do any further discussion or analysis. The second element in the analysis of optimal foreign reserves is correct analysis of the cost of financing of the foreign reserves. Discussion and analysis about the limit of foreign exchange reserves will be much easier if you know how to correct the cost of accumulation of foreign exchange reserves. These two elements allow the determination of the lower level of foreign exchange reserves and pressure to curb the increase in reserves over the limit. It is not possible to determine the precise level of foreign exchange reserves, which corresponds to the lower level, and most countries are trying to maintain a certain margin, or the amount of reserves above the specified minimum. In any case, it is important to understand that the government, except in rare cases, strives towards accumulation of foreign exchange reserves without defined upper limits (Jeanne and Ranciere 2006).

The first attempts at determining or calculating the optimal foreign exchange reserves, is found in Heller's (1966). Heller's research and evaluation of the optimal size of foreign exchange reserves is devised on the precautionary motives.

In his view, the determination of the optimal level of foreign exchange reserves is particularly important following three parameter settings:

- Costs of adjustment to external imbalances (measured as the propensity to import),
- The cost of holding liquid foreign exchange reserves (measured as the yield spread between the yield on the foreign exchange reserves that are consistent with the adopted reference portfolio and the yield on domestic bonds) and
- The likelihood that there will be a need for foreign exchange reserves of a certain size or value (which is based on historical data or past external imbalances).

In practice, they developed a number of rules defining the optimal level of foreign exchange reserves which are consistent with precautionary motives of which Heller himself started. These rules imply that the foreign exchange reserves held at a level that are equivalent to (Jeanne and Ranciere 2006):

- Quarterly imports (as counter shocks on the current account)
- From 5% to 20% of the monetary aggregate M2[9] (in order to maintain confidence in the local currency in the case of developing currency crisis) and
- The value of all debt obligations falling due in the next twelve months (in case of sudden interruption or suspension of short-term capital inflows).

Alternatively, the accumulation of foreign reserves can be a “byproduct” of the Government, or a strategy that is focused on maintaining undervalued national currency with the aim of encouraging exports. In this case, the foreign exchange reserves are not motivated by the need to harmonize consumption and prevent external shocks, but they are more a result of activities of sterilisation of the foreign exchange market (Heller 1966).

Scientific papers that explore the adequacy of foreign exchange reserves are more focused on building the macro-economic model that assesses the adequacy of foreign exchange reserves, with analysis performed for a small open economy. One such model is shown in studies of Durdu et al. (2007). The model is based on estimates of savings and reserve accumulation by a small and open

[9] The monetary aggregate M2 is a transaction money (M1 - cash in circulation and means of accounts) plus time deposits of up to one year

economy, as necessary, in response to the volatility of the business cycle, the effects of financial globalization and risk of sudden interruption. Their conclusion is that financial globalization and risk of sudden interruption may be the probable reasons for the significant growth of foreign exchange reserves in developing countries. Another model that is useful to mention is the model developed by Caballero and Panageas (2007). These authors performed a dynamic model to estimate the optimal size of foreign exchange reserves in which they analyze countries that are“vulnerable” to sudden shocks and which may invest in conventional reserves (assets with fixed income) as well as in more sophisticated assets whose payment or income, are correlated with sudden interruptions. In essence, these authors believe that the gains from optimal protection strategy can be significant. In both works, and Durdu et al. (2007), Caballero and Panageas (2007), these conclusions were derived by mathematical and statistical computation models that they developed. Although to date numerous models to evaluate the adequacy or optimal size of foreign exchange reserves have been developed, the practice still often departs from traditional definitions that are based on relationships between foreign exchange reserves and import, money suply coverage and short-term external debt.

3.3.1. Movements in foreign reserves

Foreign exchange reserves (IR) include currency foreign exchange reserves (*Forex*), non-currency reserves (non-CR) monetary gold (Gold), Special Drawing Rights in the IMF (SDRs) and reserve position in the IMF (IMF) and other assets that fall in foreign exchange reserves (Other). Currency foreign exchange reserves (*Forex*) consist of financial assets, which includes bonds (SEC), currency and deposits (DEPO), which can be expressed by the following formula (Dominguez, Hashimoto, and Ito, 2011):

$$IR = Forex + Gold + SDR + IMF + Other$$

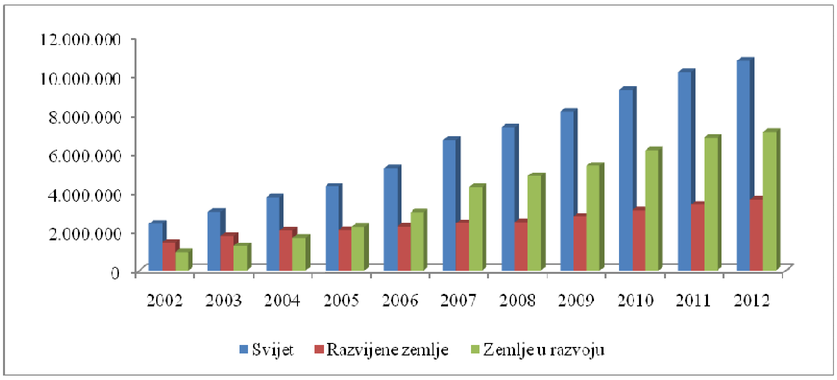
Forex= SEC+DEPO.

Forex reflects policies undertaken in the field of management of foreign exchange reserves in terms of currency denomination of foreign currency reserves, the period of, or periods of average time investment of foreign currency assets. Details of these actions are reflected in changes in the amount and structure of the components of Forex. Other foreign reserves that are designated as Other include financial derivatives, loans of non-banking institutions and non-residents, and the like. This component generally takes up a very small percentage of foreign reserves. The analysis and assessment of developments in foreign exchange reserves in the world, will show data for a period of ten years, namely from 2002 to 2012. The data presented are formed on the basis of available data set at the International Statistics (IFC).

What we can see, when analyzing sums of foreign exchange reserves by year, is that the global foreign exchange reserves tend to increase. All regions of the world have recorded a large increase in foreign exchange reserves, although the countries of Asia are well advanced in this regard. Of course, a special place belongs to China[10], which has accumulated huge foreign exchange reserves. For the duration of the financial crisis, although it might be expected that there will be a decline in foreign exchange reserves, the data indicate that it did not happen. Moreover, during the crisis period, it continued with the accumulation of foreign exchange reserves.

[10] Chin's foreign reserves on 31/12/2012 are USD 3.341.000.000.000

Figure 1 The movement of foreign reserves fro 2002 to 2012 (mil USD)



**Data for 2012 show a preliminary balance at the end of the third quarter*
Source : IMF 2013

Figure 1 shows the rapid increase in foreign exchange reserves, which are much higher in developing countries than is the case with the advanced, industrialized countries. Observed changes in foreign exchange reserves are mainly a result of buying and selling foreign exchange reserves, increasing revenues on the basis of existing foreign exchange reserves, and changes in estimates of existing foreign exchange reserves.

4. FOREIGN RESERVES OF BOSNIA AND HERZEGOVINA

Bosnia and Herzegovina has foreign exchange reserves, which are registered with the Central Bank. Investment and management of foreign reserves, their purpose, structure, determined by monetary policy and exchange-rate which Central Bank of Bosnia and Herzegovina must comply with in its activities.

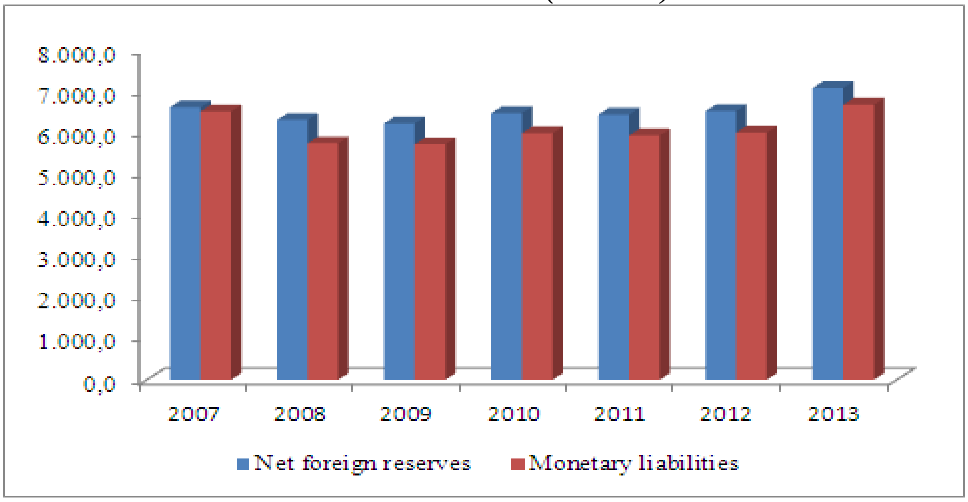
4.1. Exchange Rate Regime and Monetary Policy in Bosnia and Herzegovina

Monetary policy implemented in Bosnia and Herzegovina is based on the principles of the currency board – essentially, fixed exchange rate of the domestic currency. The exchange rate is determined by law and as such is respected. One of the reasons for the introduction of this policy is to establish and strengthen the credibility of the Central Bank but also avoid the losses that may be incurred as a result of inconsistent decisions that could come by economic policy and that, as such, jeopardize the macroeconomic situation in the country.

The key rules of the currency board are regulated by the Law on the Central Bank of Bosnia and Herzegovina. In the first place, the Law on the Central Bank of Bosnia and Herzegovina defines the rate of the domestic currency, the Convertible Mark (BAM) fixed to the Euro, which is the anchor currency, in relation to: 1 EUR = 1.95583 BAM. In addition to fixed exchange ate, there is guaranteed full convertibility of the domestic currency against the euro, and vice versa. Therefore, there is convertibility of local currency into other currencies, besides EUR.

The next task of the Central Bank is to issue and withdraw money from circulation on the basis of buying and selling of convertible marks in relation to other currencies. These transactions are carried out with commercial banks or other state institutions that hold deposits with the Central Bank, primarily the Ministry of Finance. The essence of the transaction is that other entities receive cash in local currency through commercial banks. Net foreign reserves of the Central Bank at any time have to cover, in full, all monetary obligations in convertible marks and include all banknotes and coins in circulation, the balance of the reserve accounts of commercial banks which are located in the Central Bank and other demand deposits with the Central Bank. It is important to emphasize that this rule, after the introduction of the monetary policy regime has been fully complied with. Specifically, coverage is generally amounted to over 100% of its net foreign currency reserves.

Figure 2 Coverage of monetary liabilities by net foreign reserves Central Bank od BH (mil BAM)



Source: Central Bank of Bosnia and Herzegovina 2013

Net foreign exchange reserves represent cash and deposits in foreign currencies, foreign securities, as well as monetary gold, net of liabilities that the Central Bank has to abroad.

4.2. Foreign Reserves Management of the Central Bank of Bosnia And Herzegovina

Management of foreign exchange reserves is one of the most important tasks of the Central Bank. Special attention is given to their safe investment. A framework for investing and managing foreign exchange reserves of the Central Bank of Bosnia and Herzegovina is located in the Law on the Central Bank of Bosnia and Herzegovina, the Guidelines on Investment and Operating rules for investing. Central Bank of Bosnia and Herzegovina manages foreign exchange reserves by the rules and principles of safety, liquidity and profitability. Management of foreign exchange reserves is regulated at several levels. The highest body is the Governing Council which makes strategic guidelines on the management of foreign exchange reserves. The second level of competence in the field of management of foreign exchange reserves is the Investment Committee, which makes tactical decisions (operating rules) investment of foreign exchange reserves. The Investment Committee shall not go beyond the scope which is defined by the Guidelines but may behave more cautiously in relation to the Guidelines, if it considers it necessary under market conditions.

The last in a series of foreign exchange reserve management is operational level, or employees who fulfill the decisions taken and guidance provided by the Investment Committee.

Table 1 Structure and movement of foreign reserves of the Central Bank of Bosnia and Herzegovina (mil. EUR)

Years	Gold	SDR	Foreign currency in vault	Deposits with non-resident banks	Other	Securities	Total
2007	0	0,2	20,5	3.052,97	41,26	309,95	3.424,89
2008	0	0,2	108,5	2.417,34	25,51	667,39	3.218,94
2009	32,36	2,91	54,91	1.686,24	1,12	1.398,59	3.176,15
2010	34,21	0	52,25	1.534,28	1,38	1.679,64	3.301,77
2011	77,36	0,56	47,86	2.242,32	0	916,24	3.284,33
2012	81,3	2,3	68,1	1.193,61	0	1.982,48	3.327,79
2013	83,92	1,37	46,84	1.133,84	0	2.347,985	3.613,95

Source: Central Bank of Bosnia and Herzegovina 2013

As we can see from the data presented, the level of foreign reserves in the observed period fluctuated at a level of about EUR 3 billion. Regarding the structure of foreign exchange reserves invested, the highest level is invested in securities and deposits with commercial banks. By analyzing the structure of investment we come to the conclusion that most of the foreign exchange reserves was invested in deposits until 2011, while during 2012 this trend changed in favor of securities. The share of deposits in 2011 amounted to 68.27%, while in 2007 this share amounted to 89.14%. Investing in securities is also significant, and during this period it did not change. As it can be observed, their participation in 2011 amounted to 27.90%, while only a year earlier participation amounted to 50.87% of foreign exchange reserves. It can be noted that the structure of investment of foreign reserves, by instrument, significantly changed, if we observe the structure of investment from 2007 to 2012. More specifically, the 2007 and 2008 years are characterized by the fact that the majority of foreign exchange reserves were invested in deposits with central banks and commercial banks - in 2007, share of deposits accounted for 89.14% and 75.10% in 2008. During 2007, securities recorded participation of 9.05% and in 2012, this percentage increased to 59.57%.

Table 2 The investment structure of foreign resreves of Central Bank of Bosnia and Herzegovina

Years	Gold	SDR	Foreign currency in vault	Deposits with non-resident banks	Other	Securities
2007	0,00%	0,01%	0,60%	89,14%	1,20%	9,05%
2008	0,00%	0,01%	3,37%	75,10%	0,79%	20,73%
2009	1,02%	0,09%	1,73%	53,09%	0,04%	44,03%
2010	1,04%	0,00%	1,58%	46,47%	0,04%	50,87%
2011	2,36%	0,02%	1,46%	68,27%	0,00%	27,90%
2012	2,44%	0,07%	2,05%	35,87%	0,00%	59,57%
2013	2,32%	0,04%	1,30%	31,37%	0,00%	64,97%

Source: Central Bank of Bosnia and Herzegovina 2013

Investments in monetary gold also increased since 2009. Its share from 1.04%, recorded in 2010, increased to 2.44%, recorded in 2012. In this case it is necessary to point out that the proportion of gold depends on the level of prices and not just the amount held in the portfolio of foreign exchange reserves. The strategy of investing in foreign exchange reserves of the Central Bank of Bosnia and Herzegovina is based on a comparison of the portfolio of foreign exchange reserves with the selected index (benchmark) with application of appropriate strategies and portfolio trading. When deciding on a particular investment, portfolio managers analyze in detail the yield curve of the countries in which investments are permitted, such as "strong" euro-zone countries - Germany, France, Netherlands, Belgium, Finland and Italy. Depending on market conditions, the portfolio managers make decisions on how and in what part of the yield curve to position. Priority in investment policy always is given to security or safe return on invested assets and the investment structure gives priority to those countries that carry high credit ratings.

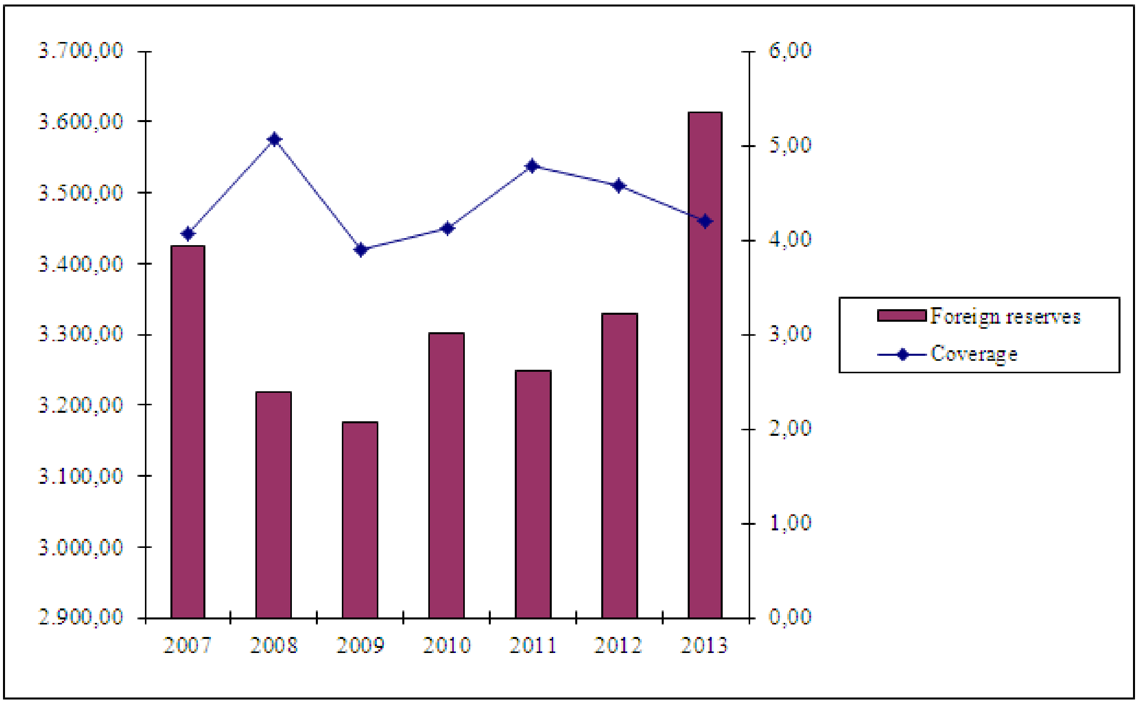
4.3. Adequacy Of Foreign Reserves of Central Bank of Bosnia And Herzegovina

It is very important that the level of foreign exchange reserves is adequate. In the previous section of the paper, the adequacy of foreign exchange reserves was described, and which parameters are used. The next section will analyze the situation in Bosnia and Herzegovina. Specifically, this document will evaluate the adequacy of foreign exchange reserves of Bosnia and Herzegovina, as follows:

- The adequacy of foreign exchange reserves in relation to the level of imports,
- The adequacy of foreign exchange reserves relative to expected cash mass,
- The adequacy of foreign exchange reserves relative to public debt.

In analyzing and assessing the adequacy of foreign reserves in relation to the level of imports, it is necessary to assess the extent to which the import is done, or how much they value the sum of imports and the structure of trade partners. The biggest trade partners of Bosnia are neighboring countries and the EU, particularly when it comes to imports. All categories of imports, i.e. all values of imports, mainly recorded in EUR, and, in spite of the CBA, which is applied in B&H, it is quite reasonable that the foreign exchange reserves are almost 100% of the amount in EUR.

Figure 3 Coverage of imports by foreign reserves of B&H



Source: Central bank od Bosnia and Hercegovina 2013 and author's calculation

Figure 3 shows that the level of foreign exchange reserves in the reporting period, covers more than three months of imports. The level of foreign exchange reserves that has been fairly stable, namely, foreign exchange reserves are already a longer period at a level of more than EUR 3 billion, while imports of variable categories. In any case, it can be concluded that, viewed from this aspect, the level of foreign exchange reserves of B&H is optimal.

The following is a comparison of the assessment of the adequacy of foreign exchange reserves to short-term external debt of the country. Bosnia and Herzegovina, when it comes to foreign debt, there is a series of data that indicate the status of short-term and long-term debt, and will therefore compare the relationship between foreign exchange reserves and total external debt.

Table 3 Foreign debt of B&H and foreign reserves of B&H (mil. EUR)

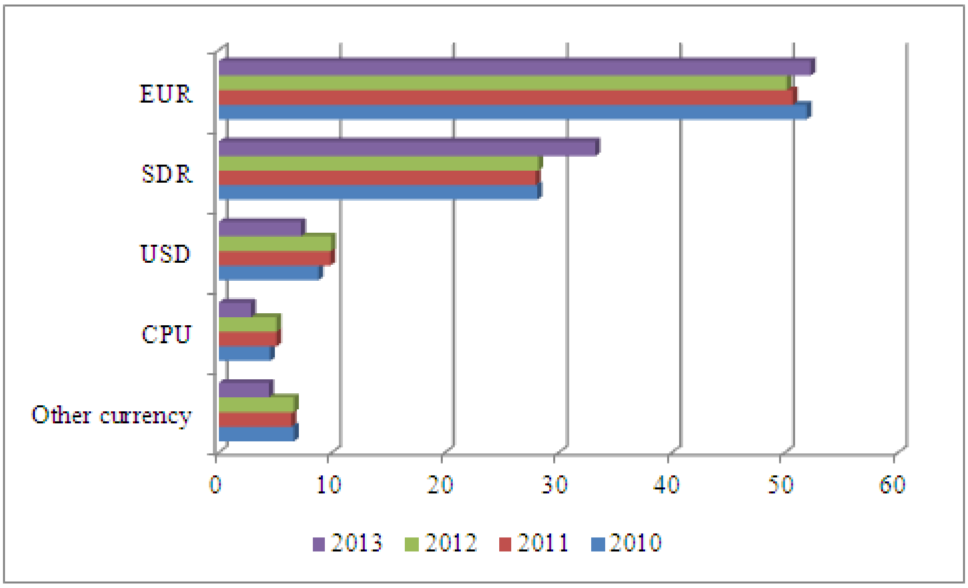
Position	2007	2008	2009	2010	2011	2012	2013
Foreign debt	2.025,23	2.167,88	2.676,10	3.215,51	3.405,72	3.658,29	3.786,12
Foreign reserves	3.424,89	3.218,94	3.176,15	3.301,77	3.248,34	3.327,79	3.613,46

Source: Central bank od Bosnia and Hercegovina 2013

It can be concluded that the amount of foreign exchange reserves covers external debt almost by 100%. From this point of view it can be concluded that the foreign reserves of BH are adequate in relation to the external debt of B&H. Apart from the size of the public debt, it is useful to look at the currency composition of public debt, which is given in Graph 4. Most of the foreign debt is in USD currency, more than 50%.

Indebtedness to the IMF's influenced that a significant part of the foreign debt is in the SDR, namely over 27% of foreign debt. On this basis, it is concluded that the currency composition of foreign exchange reserves is adequate.

Figure 4 The currency composition of external debt Bosnia and Herzegovina



Source: Ministry of Finance of B&H 2013

The next indicator review of the adequacy of foreign exchange reserves is to cover the monetary aggregate M2. Data are presented in Table 4.

Table 4 Coverage of the monetary aggregate M2 by foreign exchange reserves of the Central Bank of Bosnia and Herzegovina

Year	M2	Foreign reserves	Cover, Fore.rese./M2
2007	6.111,93	3.424,89	56,04
2008	6.360,47	3.218,94	50,61
2009	6.498,42	3.176,15	48,88
2010	6.967,83	3.301,77	47,39
2011	7.371,86	3.284,33	44,55
2012	7.623,62	3.327,79	43,65
2013	8.228,89	3.613,46	43,91

Source: Central bank od Bosnia and Hercegovina 2013 and author's calculation

According to the obtained data, it is concluded that foreign exchange reserves have largely covered the monetary aggregate M2 in all of the observed years. Specifically, foreign exchange reserves cover more than 20% of Monetary aggregate M2. Based on the presented analysis, it can be concluded that the foreign exchange reserves of the Central Bank of Bosnia and Herzegovina are adequate taccording to the observed ratios or indicators for which calculations were possible.

5. CONCLUSION

Foreign exchange reserves include public sector (usually held at the central bank) that are in the form of foreign assets, and are available at any time and are controlled by monetary authorities. Strategy and management of foreign exchange reserves is entrusted to the institution at which the foreign currency reserves are kept and which manages those assets. There are many reasons and the need to hold foreign exchange reserves, which are shown in more detail in the study.

Basically, foreign exchange reserves are held in order to support and maintain confidence in the monitory policy and exchange rate policy, limiting external shocks that may negatively affect the financial stability of the economy, boosting confidence in the capacity of the state to pay its external obligations, ensuring financial stability and so on. In order for the foreign exchange reserves fulfill their role, it is essential that there is adequate size, scope of foreign exchange reserves. Specifically, there needs to be an optimal size of foreign exchange reserves. In this paper, we identified the most commonly used method of evaluation of the adequacy of foreign exchange reserves, which is based on the precautionary measures. Although until now there have been more sophisticated methods for the assessment of the adequacy of foreign exchange reserves, the adequacy of these relations, which are explained on this occasion, are commonly used in primary grades of optimality of foreign exchange reserves. This paper gives an overview of the foreign exchange reserves of B&H and the degree of their adequacy. It has been concluded that the structure of foreign exchange reserves is adequate, and that it is in accordance with the Currency Board, currency structure of the debt, i.e., they satisfy the key elements of adequacy.

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