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Britchenko Igor, Vlasenko Yevhenii

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CONTENT

INTRODUCTION

Research rationale. Status of the national currency of Ukraine exchange rate has been characterized as unstable in recent years. Herewith, the Government has not implemented decisive measures on its stabilization, as a rule, underestimating the importance of the Hryvnia exchange rate stability for the successful economic growth in terms of socio-economic transformations. It should also be noted that in modern conditions among scientific and methodical approaches to the State exchange rate formation mechanisms some uncertainty regarding basic and additional tools for such regulatory activities allocation is still persist. The problem relevance is exacerbated by the lack of effective policy (coordination between the NBU and the Government actions) regarding the national currency stabilization as an indispensable prerequisite for an effective macroeconomic development. These circumstances determine the importance of factors influencing the national currency exchange rate and its regulation tools research, as well as new organizational and economic mechanisms for the national currency exchange rate in Ukraine stabilization identification.

In the emerging market economy conditions formation of the efficient State currency exchange-rate regulation system provides an opportunity not only to stabilize its exchange rate in different socio-economic conditions, but to create the basis for improvement the country economic development as a whole. Given this, the issue of effective tools for the national currency exchange-rate regulation by the state determination is of theoretical, practical and methodological significance. This emphasizes the relevance of further scientific-methodological and practical principles in-depth development for the national currency exchange-rate regulation.

Works of domestic economists such as I. Britchenko, G. Veriga, V. Heyets, S. Goncharenko, M. Dyba, S. Ash, S. Yegoricheva, N. Zhmurko, F. Zhuravka, D. Kovalenko, A. Kovalchuk, Y. Kozak, D. Lukianenko, O. Lupin, O. Lyubun, Y. Makogon, O. Maslova, A. Moroz, A. Nikitin, S. Nikolenko, M. Pukhovkina,

M. Savluk, T. Chernyavskaya, A. Shchetinin, etc. are devoted to the coverage of theoretical approaches of the national currency exchange-rate regulation process development and improvement. Among foreign economy experts dealing with the exchange rate formation Mundell Robert, D. Piskulov, P. Samuelsson, A. Sosnov, J. Williamson, A. Harberger, I. Shishkin, S. Shcherbakov and others should be emphasized.

However, a number of the exchange-rate regulation issues in the national economy of Ukraine remain unresolved both in theoretical and practical aspects. In scientific literature insufficient attention is paid to the exchange rate influencing factors; state tools for the exchange rate regulation development, as well as effective methods that will have an impact on the national currency exchange rate stabilization require more in-depth study. Herewith, it should be borne in mind that economic environment is constantly changing and poses new challenges to the state leadership, which are related to both the exchange rate regulation and its impact on the country socio-economic development.

The Monograph theoretical and methodological basis are scientific, general scientific and special research methods, namely: dialectical cognitive method – for the research object and subject detailed elaboration; induction and deduction – for the exchange rate theoretical concepts essence determination; historical method – for theoretical aspects of gold and foreign currency reserves in Ukraine formation determination; economic-mathematical and statistical methods – for gold and foreign currency reserves modern level and the national currency exchange rate determination; modeling, analysis and synthesis methods – in the process of interrelation between the exchange rate and factors affecting it determination.

The Monograph informational background are scientific works of domestic and foreign scientists on the issues of the national currency exchange rate regulation, legislative and normative acts regulating the currency exchange controls by the State, the National Bank of Ukraine, Ministry of Finance of Ukraine and informational resources of the Internet. All data was processed through modern information technologies application.

SECTION 1.
THEORETICAL AND METHODOLOGICAL PRINCIPLES OF THE NATIONAL CURRENCY EXCHANGE RATE REGULATION BY GOLD AND FOREIGN CURRENCY RESERVES MANAGEMENT

1.1. Theoretical Basis for the National Currency Exchange Rate Formation

An important issue of a country socio-economic system functioning is national currency exchange-rate setting. National currency exchange rate forms and stabilization mechanisms depend on the exchange rates regimes selection and factors affecting them identification. Exchange rate itself is an important factor that determines economic entities' policy in a market economy, as well as affects macroeconomic equilibrium and the state economic policy options under different socio-economic conditions. Exchange rate stabilization is of particular significance for the "weak" economies, i.e., countries in socio-economic transformation conditions, as well as for emerging market economies. In the context of economic processes globalization, the problem of effective exchange-rate regulation by the State becomes extremely important for each national economy.

The main problematic issues that affect the national currency exchange rate formation are the exchange rate regime selection and factors affecting the national currency exchange rate in certain socio-economic conditions identification. Currency units capable of functioning as international payment and reserve funds are considered as the world currencies. In countries where the national currency is unconvertible in international exchange transactions process the ratio at which the currency will be exchanged for the world

currencies, which is called the "exchange rate", is set. An exchange rate can be defined as a price of a monetary unit of one country expressed in a monetary unit of another country. In practice, scientists use different definitions of the "exchange rate" category.

Among the authors who explored the "exchange rate" term, the following are distinguished S. M. Ash, M. I. Savluk, A. M. Moroz, I. G. Britchenko, M. F. Puhovkina, O. B. Lupin, O. C. Lyubun, B. P. Adamik, S. J. Borinets, D. I. Kovalenko, B. C. Ivasiv, S.O. Maslova and others. As noted by M. I. Savluk, A. M. Moroz and N. F. Puhovkina, the exchange rate is the ratio at which one currency is exchanged for another, or a "price" of a monetary unit of one country determined in another country's currency [38, p. 269]. Another their definition is the following: the exchange rate is a value of a monetary unit of one country expressed in monetary units of another country, group of countries or in the international payment units [167, p. 487].

B. P. Adamik and S. Y. Borinets consider the exchange rate as an economic category, which represents the price of a monetary unit of one country expressed in monetary units of other countries [1, p. 177; 14, p. 202]. A. I. Berlach, N. A. Berlach and Yu. B. Illarionov argue that the exchange rate is a relative value (national value of foreign currency), so the economists who anticipate and explain its fluctuations should consider both the national economy and the economies of other countries [12, p. 230]. From S. M. Ash viewpoint, the exchange rate is the exchange value of the national currency of one country expressed in monetary units of another country [47, p. 219].

C. O. Maslova and O. A. Opalov define the "exchange rate" concept as the ratio between monetary units of two countries used to exchange currency when currency and other economic transactions conducting [96, p. 63]. D. I. Kovalenko and B. C. Ivasiv note that the exchange rate is the value of currency of one country expressed in monetary units of another country or international means of payments [61, p. 447; 64, p. 145]. Similar definitions are presented by L. O. Vdovenko, N. M. Sushko, N. D. Fayura and A. I. Schetinin [18, p. 85; 185, p. 197].

O. B. Jarish and L. B. Hnipa-Chernivetska argue that the exchange rate is the ratio between monetary units of two countries used to exchange currencies when foreign exchange and other economic transactions conducting [187, p. 68]. A similar definition is presented by V. C. Zagorskiy, A. D. Vovchak, I.G. Blagun and I. P. Chui. They note that the exchange rate is the price of one currency expressed in another one [165, p. 209]. O. S. Lyubun derives a similar definition. In his opinion, the exchange rate is the price per a foreign currency

unit expressed in the national currency units [89, p. 193]. All these generalized approaches to the exchange rate definition are presented in Appendix A.

Consequently, the "exchange rate" category can be considered as the ratio between monetary units of two countries used for currency exchange when foreign exchange and other economic transactions conducting; it is a value category inherent to commodity production and expresses production interrelation between commodity producers and the world market. The exchange rate necessity is determined by the fact that the national currency cannot act as a legal means of payment outside the domestic market. In the course of foreign economic transactions, they must be exchanged for another country's currency or international accounting units. The exchange rate setting is necessary for:

– Prices of the world and domestic markets, as well as different countries value indicators expressed in national or foreign currencies, comparison;
– Companies and banks' foreign currency accounts periodic reassessment;
– Currencies exchange in the trade of goods and services, as well as in capital and credits flows [38, p. 269].

Foreign exchange regulation plays a pivotal role for the economy of the country. Firstly, it enables to handle the national monetary unit economic scarcity. Its local value is transformed into the international one. According to this, the exchange rate acts as a means of internationalization monetary relations and the world monetary system formation. Secondly, on the exchange rates basis value indicators of individual countries comparison, entrepreneurial reproduction prerequisites and results, labor efficiency, wages, economic growth, as well as the country balance of payments are performed. Thirdly, national prices are compared with the world prices and international value on the exchange rates basis. The exchange rate is goods and services international value enforcement mechanism. Fourthly, national product is redistributed between international economic relations of the world trade member states through the exchange rates mechanism [1, p. 178; 61, p. 448].

To determine the State exchange rate regulation mechanisms its classification is important. Universal and standard classification of the exchange rates types is not available; each scientist classifies exchange rates types in different ways. Conventional wisdom is that the exchange rates main types are fixed and floating. After the Jamaican Currency Conference in 1976, the standard consciousness of the fixed exchange rate has changed significantly, and it is, in fact, a specific kind of the floating one. Typically, a fixed exchange

rate currently is a fixed ratio between the national currency and the currency of another country (or a basket of currencies) officially set by the Central Bank. A fixed rate is set on such indicators basis as prices in the country against the prices of the main trading partners ratio; foreign exchange reserves budget; trade balance status, etc. [89, p. 194]. In modern global uncertainty, a fixed exchange rate should be considered as the national currency exchange rate stabilized by certain State economic policy tools in order to create favorable conditions for the country's economic growth.

A fixed (relatively stable) exchange rate possesses some significant advantages in internal crisis conditions, especially in unstable economies, as it provides a lower rate (is a deterrent) of inflation and fairly stable conditions for foreign trade activities, as well as creates the opportunity to estimate the country development situation [38, p. 247]. However, it should be noted that the fixed exchange rate maintenance simultaneously creates considerable obstacles for the country monetary policy efficient functioning; and quite often, the economic growth slowdown due to the high interest rates is not a quite desirable outcome.

A floating exchange rate is the rate influenced by supply and demand on the foreign exchange market (ideally, without the Central Bank regulating influence). Floating exchange rates levels formation depends on the balance of payments status, interest rates and inflation rates ratio, market participants' expectations, exchange market interventions (speculative from abroad or official by the Central Bank), etc. [153, p. 19]. For a floating exchange rate successful application, the State economic and political stability, high level of socio-economic development, steady economic growth and insignificant inflation rates are required. In such conditions monetary policy as the main tool of macroeconomic regulation becomes primarily efficient [38, p. 248]. Fixed and floating rates classification is presented in Fig. 1.1.

Depending on the exchange rate fixing methods different types or methods of fixed exchange rate regime implementation are distinguished: fixed exchange rate within the European Exchange Rate Mechanism framework (ERM-II), currency pegging to one of the leading foreign currencies and foreign exchange office (currency board) are among them. A fixed exchange rate under ERM-II mechanism binds countries to keep national currencies within 15% of the announced by the European Central Bank rates within two years. Joining ERM II is a prerequisite for the further accession into the Eurozone [53, 20].

If a fixation occurs by pegging the national currency to one of the leading world currencies, depending on the currency to which the national currency is

pegged, such concepts as "dollarization" and "eurosization" are applied. The national currency to a basket of currencies pegging is carried out based on a selection of certain share of foreign currencies, which are usually the country's trade partners [49, p. 18].

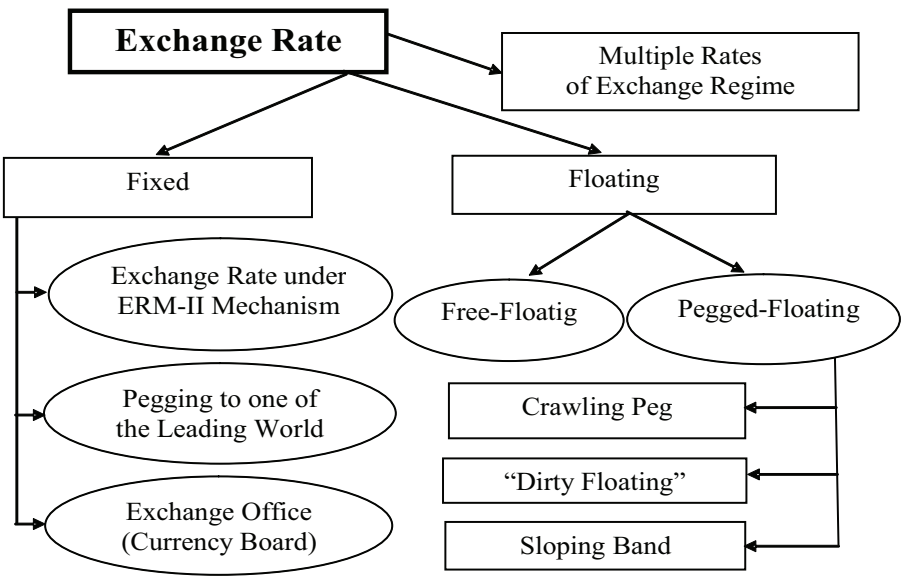

Fig. 1.1. Exchange Rates Classification (developed by the authors according to [53, p. 20; 153, p. 19])

The next exchange rate fixation method is a foreign exchange office (currency board). The exchange office (currency board) regime is quite complicated and consists in observing several principles, such as: pegging the national currency exchange rate against the reserve currency at the legislative level, covering 100% of national currency in reserve assets circulation, national currency within the country full convertibility and the lack of authority to conduct transactions with state securities [54, p. 86].

Free-floating exchange rate is the ratio between national currency and other countries' currencies depending on the currencies demand and supply on the foreign exchange market [38, p. 248]. Managed floating exchange rate is a regime of the exchange rate management, which consists in national currency value targeted adjustment, usually towards devaluation. Such a regime is mainly used during the foreign exchange markets crisis periods along with

macroeconomic stabilization measures aimed at balance of payments leveling [169, p. 27].

Basic options of the exchange-rate policy under the "pegged floating" regime are:

– Crawling peg, when the exchange rate is periodically adjusted by a pre-planned and published value;
– "Dirty" floating, in which the exchange rate fluctuates by not the pre-announced value, with an undefined periodicity;
– Sloping band, which integrates trading band and crawling peg mechanisms [169, p. 27].

Trading band embraces a special importance in the exchange rate regulating regime selection. Its specificity is in the fact that it cannot be defined as a purely fixed or floating option. The tool can be employed in both cases, or in intermediate conditions of the exchange rate regulation by the State. Definition of the trading band as a system of legal, economic and organizational measures aimed at the national currency devaluation decrease, interval for the national currency exchange rate slump margin (quotation) setting for a certain period by the State is presented in the Economic Encyclopedia [46].

Some scholars consider exchange-rate regimes classification as consisting of three other types: fixed, free floating and mixed (multiplicity rates of exchange). Multiplicity rates of exchange regime is a form of implementation monetary and exchange rate policy under which the country applies differentiated national currency rates depending on foreign exchange transactions types, these transactions participants and currencies used. Typically, such a regime involves two or more foreign exchange rates availability that are applied to different types of transactions [42, p. 218].

Fixed exchange rate has both advantages and disadvantages. The advantages of the fixed exchange rate include:

– Provision of a clear basis for companies and enterprises when planning their activities and implementing pricing policies;
– An opportunity to implement a sufficiently efficient monetary policy in conditions when the country's currency market, banking system and market infrastructure are insufficiently developed [184, p. 202].

The disadvantages of the fixed exchange rate include:

– The need to possess substantial foreign currency reserves to maintain the exchange rate in terms of the factors resulting in the real exchange rate from the fixed rate deviations;

– Impossibility of accurately determining real and fixed exchange rates ratio optimum for the country at any period;
– Loss occurrence in conditions of currency from one country to another speculative flows [184, p. 202].
– Floating exchange rates correspond to the market relations essence more than the fixed ones and possess the following advantages:
– Enables to avoid significant threats from currency from one country to another speculative flows;
– Currency supply and demand equilibrating occurs in accordance with relevant changes on the market, thus eliminating the need for official foreign exchange market interventions [184, 203].

However, the floating exchange rates policy possesses certain disadvantages as well:

– Production activities planning and perspective pricing plans developing are more complicated for companies and enterprises;
– In certain circumstances the floating exchange rate can be a significant barrier to independent national monetary policy implementation or certain pre-set macroeconomic indicators achievement;
– Currency exchange rate in a particular country can for some time be at a level that is no longer determined by the market, and thus, the country may suffer significant losses [184, p. 203].

Both positive and negative consequences of the considered exchange rate regimes availability require internal and external market situation in-depth analysis, as well as the Government and the National Bank of the country professional approach to choosing the most effective method of the exchange rate setting. Having analyzed the main types of exchange rate regimes advantages and disadvantages their impact on the country's economy should be determined (Table 1.1).

Table 1.1 Comparative Characteristics of Fixed and Floating Exchange Rates Regimes and their Impact on the Country Economic Development [50, p. 21]

Comparison Criterion	Fixed exchange rate	Floating exchange rate
Currency value formation	Fixed by the Central Bank often does not reflect the currency real value. The exchange rate is stable, the national currency is protected from external speculative changes	Fixed under the market mechanisms influence, reflects the currency real value. Risks of foreign speculative attacks on the national currency occur

Inflation	Can be available as an anti-inflationary policy tool, since it contributes to the public confidence in the national currency increase and inflationary expectations limitation	Can cause significant inflation pressure due to the prices and interest rates simultaneous fluctuation. Inflationary surges can be provoked by incompetent monetary policy
Balance of payments	Balance of payments equilibrium is ensured by strict control of the Central Bank and changes in gold and foreign currency reserves	Balance of payments equilibrium is provided automatically under the market leverage influence. Risks of this equilibrium instability under the global financial crises influence occur
Gold and foreign currency reserves	Accumulation of significant volumes of gold and foreign currency reserves necessary for exchange market interventions to stabilize exchange rate is required	Accumulation of significant volumes of gold and foreign currency reserves is not required that enables to expand monetary policy opportunities
Monetary policy	The opportunity of conducting active monetary policy, its subordination to fiscal policy as the main tool of macroeconomic regulation is restricted	The opportunity of conducting active monetary policy as the main tool of influence on economic growth and unemployment and inflation rates regulation is enabled
Investment market	Promotes the investment market stability, external operations predictability and planning	Significant dependence of the investment market upon the exchange rate fluctuations results in the riskiness level and investors distrust to the domestic economy growth

A fixed (relatively stable, regulated) exchange rate is the most appropriate option, particularly for the so-called "weak" economies, which currently include developing countries, emerging economies and economies with complex transformation processes. This is primarily due to the obvious and empirically proven fact that the general price level in these countries primarily depends on the exchange rate level. However, according to the World Bank experts study, economic growth in these countries becomes impossible if the annual inflation rate exceeds 20%. Hence, the State control and crawling peg are the national economic recovery prerequisites.

In terms of general macroeconomic theory, according to Mundell-Fleming model [113], fiscal and foreign trade policies, which given these conditions are the main tools of macroeconomic regulation, are efficient under the fixed exchange rate regime. Monetary policy should support functioning of these two state regulation tools of the national economy. From the macroeconomic point of view, the exchange rate stabilization should be predictable within the budget year and therewith rein the currency devaluation and revaluation.

Mundell-Fleming model consists of three components, which can be represented as the following equations (Formula 1.1) [113, p. 517 and 518]:

$$\begin{aligned} &(1)\ (IS)\ Y = C\,(Y - T) + I(r) + G + NX\,(Y,e) \\ &(2)\ (\mathrm{LM})\ M/P = L(r,Y) \\ &(3)\ r = r^* \end{aligned} \qquad (1.1)$$

Equation (1) is the IS curve equation (I – investment, S – savings), which describes the interrelation between yield Y and interest rate r subject to the commodity market equilibrium. This equation demonstrates that the aggregate income Y is equal to the sum of consumption C (as a disposable yield function Y – T (T – tax), investment I (as an interest rate r function), government expenditure G and net exports NX (as yield Y and the exchange rate e function; net exports is equal to the exports and imports difference).

Equation (2) is the LM curve equation (L – liquidity M – money supply). It defines the interrelation between yield Y and the interest rate r subject to the monetary market equilibrium. In accordance with this equation, the real money supply M / P (P - price) must equal the money demand L, which, in turn, is an interest rate r and yield Y function. Money supply M is determined by the Central Bank and price level P is an exogenous variable.

Equation (3) demonstrates that the domestic interest rate r is determined by the world interest rate r*. In other words, the Mundell-Fleming model has been developed for a small open economy that can obtain or grant loans of any amounts on the world financial markets without affecting the world interest rate.

According to the model, the fiscal policy is efficient under the fixed exchange rate, Figure 1.2 [113, p. 517 and 518].

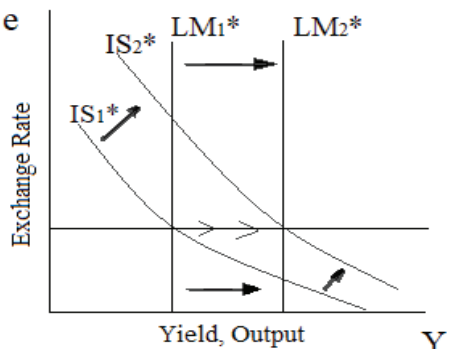

Fig. 1.2 Mundell-Fleming Model of Fiscal Policy under the Fixed Exchange Rate [113, p. 532].

In the economy under a fixed exchange rate in which the policy of domestic demand stimulating by the State procurements increase or taxes decrease is conducted. This results in the IS* curve shift to the right and causes a trend of the exchange rate growth (Fig. 1.2). However, since the money supply varies so as to keep the exchange rate equilibrium, it should increase shifting the LM curve to the right as well. Thus, promotional fiscal policy under the fixed exchange rate adoption results in total income increase (in contrast to the floating exchange rate situation (Fig. 1.3) when the exchange rate grows and the income remains equilibrium). This is due to the fact that a promotional fiscal policy under a fixed exchange rate implementation automatically results in monetary expansion [113, p. 532-534].

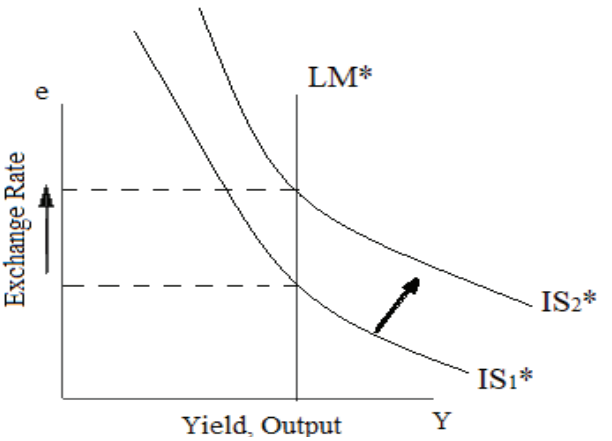

Fig. 1.3 Mundell-Fleming Model of Fiscal Policy under the Floating Exchange Rate [113, p. 524].

Thus, for national economies in transformational reforms conditions fiscal policy should primarily perform the leadership role of macroeconomic stabilization tool; while the monetary policy, including currency exchange regulation policy, should support fiscal regulation and national economy stabilization measures [113]. Since Ukraine is a country in which economic transformations are in progress and economic development is ensured by the fiscal policy objectives, the choice of the Hryvnia fixed (relatively stable) exchange rate is the most optimal option for creating conditions for the national economy development.

Consider regulatory and institutional framework for regulating the processes of exchange rate formation in our State in more detail. The main legislative acts regulating currency exchange rate issues in Ukraine are:

- Constitution of Ukraine;
- Law of Ukraine "On the National Bank of Ukraine";
- Decree of the Cabinet of Ministers of Ukraine "On the System of Currency Regulation and Currency Control";
- Resolution of the National Bank of Ukraine "On the Official Foreign Exchange Reserves and Foreign Exchange Transactions of the National Bank of Ukraine in 1994";
- Resolution of the National Bank of Ukraine "On Setting the Official Exchange Rate of the Hryvnia against Foreign Currencies and Banking Metals".

According to the Constitution of Ukraine, ensuring stability of the monetary unit is the main function of the Central Bank of the State – the National Bank of Ukraine [76]. The National Bank of Ukraine shall perform the following functions in relation to the exchange rate formation: under the powers determined by regulation framework provide for the foreign exchange regulation; determine procedure and terms of currency transactions; organize and exercise foreign exchange control over banks and other financial institutions licensed by the National Bank to conduct currency operations; provide for gold and foreign currency reserves accumulation and custody and transactions with them and banking metals [137].

Within its authority, the NBU conducts devises foreign exchange policy and sets an official exchange rate [137]. Decree of the Cabinet of Ministers of Ukraine "On the System of Currency Regulation and Currency Control" determines the NBU currency control procedure in respect of the currency exchange rate setting [140]. The NBU Resolution "On Setting the Official Exchange Rate of the Hryvnia against Foreign Currencies and Banking Metals" determines the procedure for setting and application the official exchange rate of Hryvnia against foreign currencies and banking metals by the National Bank of Ukraine [135]. Exchange rate policy is an integral part of the governmental program of the State economic development and the full range of tools and real opportunities for their implementation should be considered. According to the Decree of the Cabinet of Ministers of Ukraine "On the System of Currency Regulation and Currency Control" dated February 17, 1993, the national currency exchange rate setting falls within the NBU and the Cabinet of Ministers shared competence [140].

In accordance with the International Monetary Fund classification introduced in 2009, three groups of exchange rate regimes, which differ in terms of the exchange rate flexibility degree, are defined.

1. Strict peg regimes:
   – Exchange rate regime without sovereign means of payment;
   – Currency board.
2. Soft peg regimes (including intermediate regimes):
   – Conventional peg;
   – Exchange rate stabilization regime;
   – Fixed pegging with a band;
   – Creeping pegging;
   – Regime with quotation price adjustment opportunity.
3. Floating regimes:
   – Floating regime;
   – Free floating [132, p. 32-33].

The issue of the exchange rate regime determination is complex and controversial, since the main importance in the whole complex of economic ties internationalization is attributed to the exchange rate. National commodity prices level, wages, as well as many other cost indicators are compared with similar indicators of foreign countries by its application. On this basis export-import operations efficiency, production of certain goods feasibility, etc. are determined [38, p. 279].

Discussions regarding the exchange rate regime selection have long existed in the world economic science and practice. With the onset of 1998, the so-called period of the currency systems of the countries of the Association of Southeast Asian Nations transformation, the debates as to the expediency of a specific tool in monetary policy in the country application renewed. Thus, Fisher (2001) and Rogoff (2004) suggested a regime of flexible exchange rates for the emerging countries. This opinion was not supported by McKinon (2000), who stated exceptional efficiency of entirely fixed exchange rates, and Shtiglitz (2001), who asserted that free-floating exchange rates could influence export and detain economic growth. In crisis and post-crisis conditions, entirely pegged exchange rates can provide stability [163]. We agree that a fixed ("pegged") exchange rate choice is a prerequisite for weak and emerging economies positive development. The world experience of different countries given below is the confirmation of this exchange rate formation option.

Brazil: In 1986, a new currency was introduced and its fixed rate against the US Dollar was set to overcome inflation and streamline the country financial system. The country's financial situation demanded cutting social expenditure and prices fixing. It should be noted that this enabled to rein the inflation rate for a certain period. The above-indicated factors, as well as the Bank interest

rates reduction boosted consumer demand, which was the impetus for the production growth [52, p. 42-43].

Experience has proven that Bulgaria, Romania, Russia and Ukraine have chosen a flexible exchange rate regime. Others, such as the Czech Republic, Hungary and Poland have chosen a fixed exchange rate option. It turned out that the latter had better indicators of economic activity both in terms of decline in inflation, and in relation to the accompanying changes in the output. Although, other factors were also quite influential. Hence it can be concluded that pegging have always been a better option of the exchange rate formation as compared to the flexible exchange rate policy at the initial stages of transitional period.

The Czech Republic, Hungary and Poland have gained macroeconomic stability earlier, and, ex post, were the first of the post-socialist countries. The same has happened with reforms at the micro level. However, the most striking was the difference arguably between the former USSR countries, in particular, the Baltic States of Estonia and Latvia. While Estonia introduced a fixed exchange rate system (in the form of a currency board), Latvia at the same time introduced a flexible exchange rate option, imposing pegging as late as in 1994. Obviously, the both countries have overcome high inflation rate, but Latvia has done this with significantly higher loss in the form of lost output; its GDP annual growth in 1993, 1994 and 1995 amounted to 15%, 2% and 1% respectively. GDP in Estonia amounted to 7%, 6% and 6% during the same period [191].

Czechoslovakia started reforms in financial stability terms abetted by significant foreign currency reserves level. To ensure the national currency stability, Czechoslovakia introduced a fixed exchange rate regime of the Koruna in the early 1990-s. After the country dissolution, the Czech Republic and Slovakia continued to follow a clear course towards restrictive policy, which allowed keeping the Koruna exchange rate on the predesigned (stable) level. While its fluctuations in the Czech Republic equaled to 1.5-2%, and in Slovakia - 3-4%. Foreign exchange market interventions were applied as an important tool for the exchange rate stabilization as well [35, p. 177].

From January 1991 to March 1995, the National Bank of Hungary applied crawling “peg” regime of the Forint to a basket of currencies. The exchange rate during this period acted as the point for two contradictory goals, namely: ensuring external competitiveness and providing a nominal “anchor” for prices stability [52, p. 50-51].

According to international experience, different world countries at different times insuperably introduced a fixed exchange rate regime (in different variants

of stabilization control) to overcome crises effects, as well as for the economic development. When fixing the exchange rate the government supports macroeconomic stability, while prices in the country fluctuate slowly, without surge pricing, at this inflation rate decrease and GDP growth occur. The very nature of a fixed exchange rate in its modern sense restricts sharp currency devaluations and revaluations possibility, which displays this factor as the key in the development process of emerging countries. However, a fixed exchange rate as the main reference point for monetary policy application becomes possible only in the case of gold and foreign currency reserves sufficient level.

Thus, based on international experience, as well as surmounting the crisis phenomena and national economy enhancement through a fixed exchange rate regime selection in different countries analysis, the choice of fixed pegging with a band regime seems appropriate for the Ukrainian economy in the current situation. Due to this regime, national currency exchange rate stabilization, assuming some fluctuations in the short-term periods, and with sufficient gold and foreign currency reserves level due to exchange market interventions availability, the state long-term stabilization or even national currency prices increase (strengthening) become possible. However, strict regulation is inappropriate for the Ukrainian economy nowadays; it will inevitably result in the economy sharp fluctuations and derogatory shifts on the monetary market. For this reason, monetary stabilization policy should be focused on the real exchange rate setting and be predictable for the long-term period.

The National Bank of Ukraine sets the official exchange rate of the Hryvnia against foreign currencies, international accounting units used by Ukrainian residents and non-residents for all types of foreign currency transactions payment and settlement, including budget and customs, for these transactions accounting and foreign economic activity analysis [135].

The official exchange rate of the Hryvnia against foreign currencies is set: a) for freely convertible currencies and the currencies of the countries which are the major foreign economic partners of Ukraine; b) for other foreign currencies once a month. The official statement of the Hryvnia exchange rates against foreign currencies is sent daily to the leading media and the NBU regional administration, with the latter being made available to commercial banks [135]. The official exchange rate of the Hryvnia against foreign currencies comes into force on the day following the date of approval [152, p. 409].

The exchange rate in accordance with applicable rules and regulations of the currency legislation setting is called foreign exchange quotation. Two methods of currency quotes setting are used in the world theory and practice,

namely: direct and indirect. The quotation procedure content is interbank rate determination and registration by each currency demand and supply sequential matching. On this basis, a buyer and a seller rates are set [53, p. 6-7].

The bid rate is the rate at which market participants (banks) purchase a foreign currency (lower rate). The offered rate is the rate at which market participants sell a foreign currency (higher rate). The offered rate is invariably higher than the bid rate. The difference (margin) or the spread between the bid and offered rate is a source of profit for the currency market subject (bank), which performs the quotations. The exchange rate margin is calculated according to the formula (1.2) [53, p. 6-7]:

$$M = \frac{OR - BR}{BR} \cdot 100\ \%, \tag{1.2}$$

Where: M is a currency margin; OR – offered rate; BR – bid rate.

This margin is the bank's income, since the banks sell currency at a higher rate than they purchase it. Banks set the spread independently, but in some cases (instability of the economic situation, threat of speculative spurts, and significant fluctuations in market actors' expectations) the NBU may and sometimes has to set its maximum permissible value. Such restrictions appear necessary to prevent speculation and overcome crisis phenomena in the country's economy.

Each currency has not the only one exchange rate, but as many as existing currencies are available. Exchange rates having different numerical expressions are interrelated and constitute an aggregate of prices, interrelated by tripartite arbitration. Arbitration is the exchange of two currencies through the third one to generate profits based on the exchange rate and the cross rate difference. It is called tripartite, since it involves three currencies. Cross rate is the exchange rate of two currencies (A and B) against the third currency (C). The cross-rate determination is performed by the conversion currency "A" into currency "C", and then –currency "C" into currency "B" according to the Formula (1.3) [68, p. 212-213]:

$$(A/C)\cdot(C/B) = A/B \tag{1.3}$$

Taking into account that the US Dollar is a dominant currency in global payments, to facilitate currency exchange operations and national currencies quotes calculation is not relative to one another, but relative to the US Dollar, and through it to other currencies in most cases. For this reason, virtually all

rates, which do not set quotes to the US dollar, are called cross-rates. Most often, three cross-rates calculating methods are applied in practice: direct quotation to the US dollar (the dollar is the quotation base for both currencies); direct and indirect quotation to the dollar (the dollar is the quotation base for one currency only); indirect quotation to the dollar (the dollar is the quotation currency for both currencies) [53, c. 16-17].

In economic theory and practice, a large number of different exchange rates types are applied, their detailed classification is presented in Appendix B. Correct exchange rates determination is of great practical significance since the exchange rate directly affects the import price expressed in domestic currency and the export price converted into the foreign currency. Fluctuations in the exchange rates affect export and import prices ratio, enterprises competitiveness, and corporate profits. Sharp exchange rate fluctuations increase international economic, in particular monetary and financial, relations volatility, cause negative socio-economic consequences, loss of ones and payoffs of other countries [38, p. 272]. Like any price, the exchange rate deviates from the value basis – currencies purchasing power parity – under the influence of currency demand and supply. Such supply and demand ratio depends on many factors that reflect the exchange rate with other economic categories interrelation, such as value, price, money, interest, balance of payments, etc. [38, p. 270].

A large variety of classifications of the exchange rate formation factors is available in economic literature, which makes conducting their detailed analysis and a coherent classification approach elaboration necessary. The most traditional approach is presented by D. Yu. Piskulov, who identified three groups of factors for the exchange rate formation, namely: 1) fundamental – the main macroeconomic indicators that affect currency market participants and the exchange rate formation process in the medium term; 2) technical factors, that is, the basic regularities of the foreign exchange rates behavior in retrospective that affect currency purchase or sale decision-making and are rather of a psychological character; 3) short-term or unexpected – force majeure circumstances, political actions, actions of central banks, etc. [124, p. 86].

Instead, J. William suggested a slightly associated correlation between macroeconomic indicators and the exchange rate, and to create a more precise model the factors were divided into two groups: 1) traditional fundamental (money supply, price level, nominal interest rates, etc.); 2) actual fundamental, that is, of the financial market indicators [192, p. 257].

In our opinion, despite the existing difference in driving factors influencing the national currency division, the most appropriate and efficient is the

classification by effective terms, which, moreover, is the most common in the world practice. Generalized classification of the exchange rate influencing factors is presented in Fig. 1.4. Thus, the exchange rate is influenced by three main groups of factors: a) long-term (structural); b) short-term (conjuncture); C) emergency (force majeure) factors.

The exchange rate, under certain circumstances, is affected by extraordinary, so-called force majeure, factors, or circumstances of unpredictable actions as well, namely: financial and economic crises; political events such as war, change of government, terrorist acts; natural disasters (earthquakes, tsunamis, typhoons, floods, etc.); epidemics, man-made disasters and other emergencies.

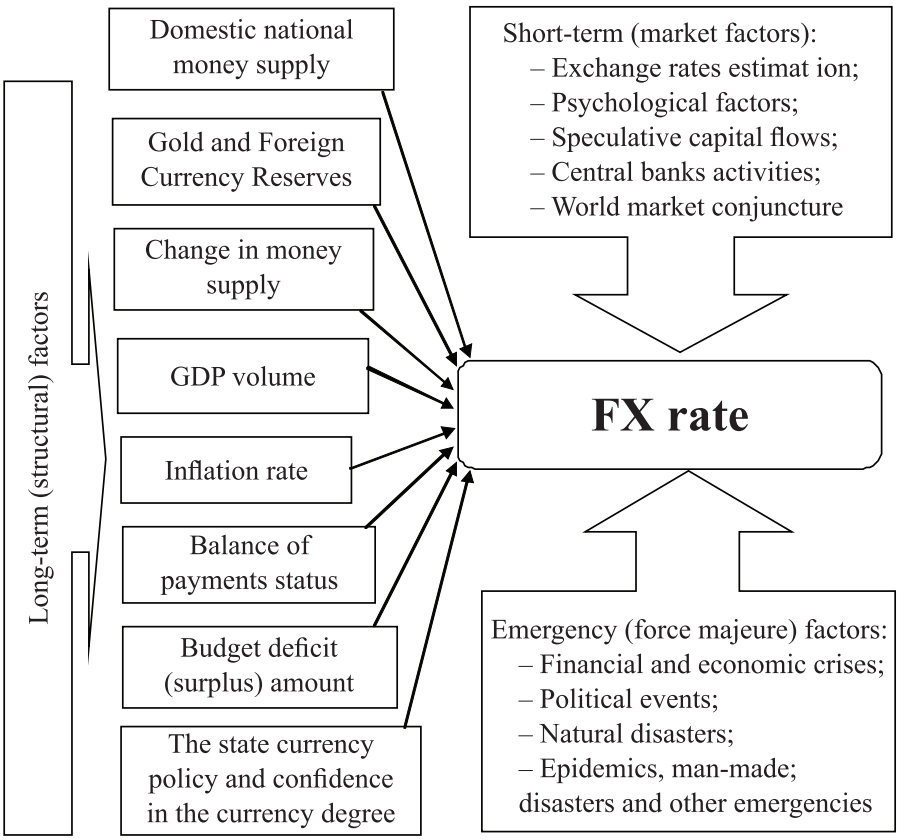

Fig. 1.4. Factors Influencing the Exchange Rate (developed by the authors according to [5; 51; pp. 228; 77; p. 15; 174; p. 202; 181 p.66])

An important group of factors influencing the exchange rate are short-term (conjuncture) factors. These are specific conditions that arise at a certain period,

which are difficult to predict and which impact nature is the most diverse. Conjuncture (short-term) factors (or factors of condition) affect the exchange rate according to short-term changes in business activity dynamics and are not associated with certain shifts in the real sector of the economy [5].

Different predictions of the exchange rate fluctuations through dissemination via the media rumors, expectations and speculations that generate fever in the currency market are particular influential. In this aspect, a significant factor influencing the exchange rate is psychological, i.e. the society pessimistic or optimistic attitudes regarding further economic development prospects, as well as inflationary and devaluation (devaluation) expectations, etc.

In the current unstable situation in the country such factor as speculative capital flow deserves special attention. This factor can affect the exchange rate dynamics in the event that the Central Bank tries to maintain it at a certain level as the market forces counter. If the rate of the national currency tends to decrease, businesses and banks are trying to sell it in exchange for a more stable currency in advance, expecting to make a return transaction at a lower rate in a certain time. Thus, the price differential constitutes the speculative income. Such operations significantly weaken the national currency exchange rate and the Central Bank's efforts ultimately prove to be ineffective [51, p.228].

The National Bank takes on enormous importance on the foreign exchange market, performing the selected option of the exchange rate policy in the state. Foreign exchange regulation is aimed at its increase or decrease on its objectives basis. The National Bank can offer preferences for exporters or importers. At the exchange rate undervaluation, exporters receive surplus income, and thus the opportunity to manipulate the price when competing for markets with other countries. If the rates are overestimated, additional preferences will be given to importers who, after the imported goods sale, will be able to receive more foreign currency when the national currency exchanging [174, p. 202].

Conjuncture factors on the exchange rate dynamics impact is difficult to be predicted, especially in emerging economies with unstable conditions and political system. The result of aggregate conjuncture factors impact is capital flows that are directly related to political events in the country, thus, it is the domestic political instability in the country that generates capital outflow. Since the capital outflow is capital active export by residents and non-residents, this logically results in demand for foreign currency growth and the national currency devaluation [51, p. 227].

Along with conjuncture factors, which impact is difficult to predict, the currency demand and supply, that is, its exchange rate dynamics, is affected by

relatively long-term trends that determine a particular national currency in the currency hierarchy position as well. GDP volume (market value of all goods and services produced in the country) is of significant impact on the exchange rate. There is a directly proportional correlation between GDP and the exchange rate: an increase in GDP results in the demand for the Hryvnia growth, since production volumes, the population effective demand and national products competitiveness increase, and this, in turn, results in national currency unit price growth. If GDP growth is projected to decline, foreign exchange market participants purchase foreign currency, which causes the national currency devaluation [181, p. 66].

The rate of money supply fluctuations is directly related to the exchange rate realignment. Money supply growth (both cash and cashless) results in national currency exchange rate decline, and vice versa. Control of the total money supply in Ukraine is performed entirely through the banking system through the NBU or commercial banks emission activities. At this, the NBU conducts both cash and cashless money emissions, while commercial ones – of the cashless only. The exchange rate can be influenced by money supply dynamics in two areas:

1) Affect the domestic price level, which, in turn, affects the exchange rate level;
2) Directly affect national currency supply and demand that causes its prices fluctuations on the domestic exchange market

For money supply analysis the monetary aggregate M2 is most often applied, which includes cash mass, cash on current accounts and on-demand deposits, as well as all types of thrift accounts funds. This is due to the fact that the national currency exchange rate setting is influenced by supply and demand, which, in turn, are formed at the cost of the foreign exchange earnings from international trade transactions [42, p. 149-150].

The following factor affecting the exchange rate is balance of payments status. The balance of payments is the ratio of all actual payments made by a particular country in favor of other countries and revenues obtained from abroad [43, p. 269]. Active balance of payments contributes to the national currency exchange rate growth, as the demand for foreign debtors and foreign currency inflow to the national exchange market increases. Passive balance of payments generates national currency downward trend, as the debtors convert it into the foreign currency to repay their foreign liabilities. If the country's trade balance is deficient, the demand for foreign currency will increase as a result of decrease in foreign exchange earnings [47, p. 250].

Inflation (deflation) is an important factor affecting the exchange rate. The higher is the inflation rate in a country, the lower is its currency exchange rate. Inflationary depreciation of money in the country causes a decline in purchasing power and a tendency to drop the exchange rate against the currencies of the countries where the inflation rates are lower. This trend is commonly observed in the medium and long term. The dependence of the exchange rate on the inflation rate is particularly high among countries with a large volume of international exchange of goods, services and capital. This is explained by the fact that the closest interrelation between the exchange rate dynamics and the inflation relative rate is in evidence when the exchange rate is based on export prices calculating [98, p. 43-44].

Another factor affecting the exchange rate is budget deficit, which results in the exchange rate decline and debts accumulation, and accordingly, the surplus results in the exchange rate growth [44, p. 36-37]. Domestic supply of national money effect is based on the foreign exchange market with other monetary market segments close links. If money supply on bank loans or securities markets increases, it may worsen these markets conditions; as a result of which part of the money supply will be forwarded from there to the currency market, where the conditions remained equilibrium. But if such money flow is significant, the demand for currency will grow at outstripping rate and the equilibrium will be disturbed. If the money supply grows in the foreign exchange market directly (external offer), as for the foreign exchange intervention purpose, it will immediately affect its market conditions and it will deteriorate for the national currency [38, p. 268].

The factor significantly affecting the currency exchange rate and the country's economy is gold and foreign currency reserves (official foreign currency reserves) status. To maintain the exchange rate, Central Banks must have sufficient official foreign currency reserves level. If the country does not possess the necessary resources, a fixed rate can be considered artificially supported, and thus, more vulnerable to speculative attacks [77, p. 15]. The country stable exchange rate support can be ensured by gold and foreign currency reserves accumulation. A certain part of the world has created and has effectively been applying the so-called "Sovereign Wealth Funds" during the past half-century, which can be considered a form of the country gold and foreign currency reserves accumulation.

The state is the instrumental in the exchange rate setting. It is the foreign exchange regulation that determines the extent of the state bodies interference into the subjects of currency relations activities, which, in turn, affects the

exchange rate realignment. Foreign exchange regulation measures are aimed at the national currency exchange rate increase or decrease with macroeconomic equilibrium maintaining objective [181, p. 68].

The population confidence is an important factor influencing the currency exchange rate. The higher the confidence in the currency is, the greater is its share in international transactions, and it is in higher demand from international traders, and thus, this demand dynamic affects the exchange rate directly. The fact that adequate and reliable information lack increases speculative attacks risks and weakens currency stability must be taken into consideration. With the foreign exchange market development in economic globalization conditions and its structure improvement the need for the exchange rate dynamics estimation increases, which implementation is impossible without consideration all factors both of short-term and long-term nature [51, p. 229].

Thus, the exchange rate is the ratio between monetary units of the two countries used to exchange currencies when foreign exchange and other economic transactions conducting. An important prerequisite for the country's economy proper functioning is the proper monetary stabilization policy introduction, which is of a significant impact on the prices level, inflation rate and growth of the national economy. Exchange rate formation is a multifactorial process due to national and global economies close interrelation, various spheres of the country's life interdependence and situations and phenomena variety. Given this, structural and conjuncture factors analysis and their impact on the exchange rate nature determination are the prerequisites for monetary and exchange rate policy implementation and the exchange rate estimation.

1.2. Primary Tools of the National Currency Exchange Rate Regulation

State regulation of the national currency exchange rate is a set of tools by which the exchange rate is set by the Government. It includes formal and informal instructions and auxiliary rules set by the State in the course of the national currency exchange rate regulating [46]. Their essence and content determine institutional support nature of the State currency exchange rate policy. In a narrow sense, the latter is an integral component of the monetary policy and includes a number of tools for its implementation, among which a holistic system of the country gold and foreign currency reserves state management is important.

Consequently, state regulation of the national currency exchange rate is a complex and multifaceted process, since each country, both economically developed and emerging, faces the issue of appropriate monetary policy tools that provide the selected currency exchange rate formation selection. The process should involve all major state agencies that directly affect the country macroeconomic stability and are responsible for the State socio-economic development level.

The main objective of the State exchange rate regulation system in conditions of the global turbulent changes in international economic relations is its stabilization within the range available for a given national economy at a time interval that can be predicted. This should be facilitated by a holistic national currency regulation system.

The State is the instrumental in the exchange rate regulation. The long-term efforts of the National Bank in our country in the national currency exchange rate regulation sphere aimed at the foreign exchange market of Ukraine development and strengthening provided for: foreign exchange market appropriate model creation, its infrastructure and bidding and exchange rate regimes mechanisms development; foreign exchange market gradual development – currency structure diversification and increasing amounts of foreign exchange funds attraction; certain level of gold and foreign currency reserves of the National Bank of Ukraine for conducting effective foreign exchange policy accumulation and maintaining; possibility for the foreign currency to be timely obtained (purchased) by domestic enterprises-importers and be sold by exporters, etc. [53, p. 54].

In addition to the National Bank of Ukraine, which is the highest State body in currency and exchange rate policy implementation, the Government can influence the exchange rate as well. These two main State institutions can apply two main tools of the State macroeconomic policy: 1) monetary, which affects the exchange rate through the money supply mechanism (the NBU competence); 2) fiscal, which influences the exchange rate due to Government expenditures and taxes changes (the Cabinet of Ministers of Ukraine competence). It should be noted that in economic instability context a significant drawback in monetary policy application to influence the exchange rate is that large fluctuations in money supply in the country can result in inflation or deflation. This eliminates the possibility of monetary policy application to regulate the currency exchange rates [111, p. 292].

Consequently, currency regulation is an important means of monetary policy implementing, which should be subject to general regularities of the

economic mechanism functioning and included in economic management and its external relations system. Currency regulation is a system of legislative, administrative, economic and organizational measures implemented by the State authorities to determine the procedure for transactions with currency values aimed at ensuring economic growth on the country's territory [187, p. 90]. One of the currency regulation main objectives is the exchange rate system organization, national monetary unit protection and necessary convertibility degree ensuring. Currency regulation characteristics are:

1) Importance of the national currency legislation regarding currency values application increase, which requires some regulation and managing by the Government and the Central Bank, in connection with which the role of currency legislation in determining the foreign exchange circulation process, taking into consideration the need to ensure the country monetary unit priority, protecting its purchasing power and resolving other factors affecting the national monetary unit convertibility;

2) Foreign currency regulation program development, which should take into account foreign exchange market of a particular country achieved development level; the need to facilitate banking and financial sectors development; the economy's dependence on imports (especially energy), hence the need to stimulate an increase in export earnings and foreign investment;

3) Consistent policy for currency stabilization should be aimed at gradual introduction of the currency convertibility based on planned, gradual liberalization of foreign exchange transactions;

4) Exchange rate regime regulation taking into consideration domestic inflation rate and exporters interests. The latter is more important for countries that do not have significant foreign investment and access to external loans, in connection with which exporters are the main source of foreign currency. Such regulation should be implemented through market methods exclusively;

5) Ensuring a sufficient foreign exchange reserve accumulation by the National Bank in order to be able to stabilize the currency exchange rate (or guarantee its gradual decrease in compliance to domestic prices growth) for a sufficiently long period;

6) Creating favorable conditions for the exporters for foreign currency resources of the country application; currency primarily sale not to the Government, but to the National Bank, which in such a situation will act as foreign currency monopoly seller for the importers needs on the domestic market, and will strive to ensure equal access to it for all importers, subject to convertibility level and the national currency exchange rate requirements.

After the exchange rate stabilization commercial banks will actively participate in the process. Balance of payments surplus stabilization and inflation overcoming will allow to cancel the mandatory sale of currency revenues [47, p. 243-245].

Professor A. M. Moroz offers to consider techniques, leverages and methods used to influence foreign exchange relations of the market actors to implement currency regulation and currency control in the country as currency regulation tools. According to institutional approach, Central Banks, Ministries of Finance, and special state institutions are the main executive bodies of currency regulation and control. The given economic category, based on the essence interpretation, possesses a number of specific features that separate it from other concepts and emphasize the implementation peculiarities (Table 1.2) [49, p. 18].

These specific peculiarities take the form of principles. Table 1.2 presents a list of characteristics and basic principles underlying currency regulation tools application. The main tools of currency regulation applied by the Central Banks are: exchange market interventions; currency devaluation or revaluation; discount accounting policy; foreign exchange policy; foreign exchange reserves management; foreign exchange restrictions [1, p. 175].

Table 1.2 Basic Principles of Currency Regulation Tools Application [49, p. 18]

Principle	Characteristics
Objectiveness	Currency regulation tools application should prevent such exchange rates manipulation, which would allow gaining unfair competitive advantages for certain participants in the State economic system
Efficiency	A specific tool application should be accompanied by a corresponding economic benefit, consistent with currency regulation and the State development strategy objectives
The state economic interests protection	The main purpose of the tools application is foreign currency regulation aimed primarily at economic policy implementation and the national interests protection
Publicity	State policy in the currency regulation sphere and the resulting set of currency regulation tools applied, should be public both in rationale for the tools sets selection and in the their application outcomes
Equality	When currency regulation tools application all economic actors interests must be taken into account
Flexibility	Currency regulation tools can be modified or replaced by others where appropriate
Coherence	Currency regulation tools application should be predictable and not be subject to sudden unexpected changes

State regulation optimality	Market and relationship between its participants should be the main tool of foreign currency regulation. The State intervenes in their activities only in economic necessity conditions

Fig. 1.5 presents currency regulation tools classification. Currency regulation tools are divided into two subgroups, namely: of direct and indirect effects (in some sources they are divided into tools of direct and indirect impacts). Different approaches to the currency regulation tools classification are available. Thus, tools of direct impact include foreign exchange policy and administrative methods of currency regulation. Foreign exchange policy is currently one of the main currency regulation tools in Ukraine.

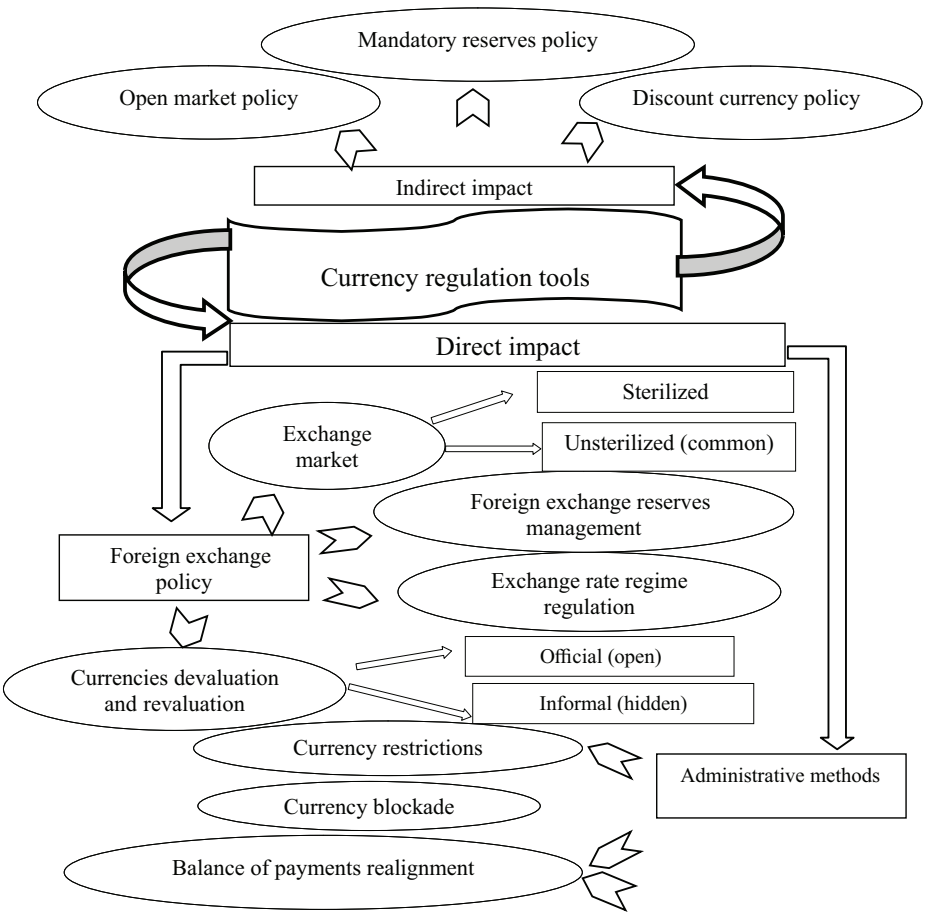

Fig. 1.5. Currency Regulation Tools Classification (developed by the authors according to [1, p. 175; 39, p. 284; 89, p. 122; 123, p. 413])

Foreign exchange policy is a policy of regulating exchange rate through foreign currency sale or purchase. The National Bank carries out the foreign exchange policy on the basis of the exchange rates of the national currency against foreign currencies regulation by currency purchase and sale on the central markets. The main form of the foreign exchange policy implementation is foreign exchange reserves management (diversification). Foreign exchange policy includes the following exchange rate regulatory tools: exchange market interventions, currency reserves management, currencies devaluation and revaluation, exchange rate regime regulation [1, p. 176; 89, p. 122].

Exchange market interventions are one of the key foreign exchange regulation tools. Exchange market interventions are direct interventions of the National Bank in the foreign exchange market functioning through foreign currency purchase and sale to influence exchange rate of the national monetary unit. Foreign currency supply and demand balancing occurs through foreign currency purchase and sale by the Bank, which also results in the national monetary unit exchange rate fluctuations limitation. Exchange market interventions stipulate the Central Bank to involve two main sources:

1) Official gold and foreign currency reserves of the country;
2) Short-term mutual loans on the interbank swap agreements basis [64, p. 148].

Exchange market interventions are performed when short-term fluctuations in demand and supply are observed on the market, that is, the need of the exchange rate stabilization occurs. The National Bank expects previous equilibrium rapid restoration. Exchange market interventions will not lead to a positive result if such fluctuations are of a long-term nature stipulated by underlying macroeconomic processes. They can only delay the relevant exchange rate fluctuations for some period during which the Government should take measures on the balance of payments equilibration. Otherwise, after the foreign exchange reserves exhaustion, an even more catastrophic shock in the foreign exchange market is inevitable [89, p. 251]. Exchange market interventions can be performed in two ways, that is foreign currency purchase and sale. Interventions involving national currency sale for foreign currency purchase provide foreign currency reserves growth and money supply on the domestic market increase [39, p. 284]. Intervention in which domestic currency is purchased by selling assets outside the country, causes: foreign exchange reserves decrease, money supply on the domestic market reduction and national currency value growth [39, p. 284].

Depending on the impact on the domestic economic processes dynamics, exchange market interventions of the National Bank are divided into two main types: unsterilized (common) and sterilized (neutralizing).

Unsterilized exchange market interventions are interventions in which the change in the Central Bank's foreign currency reserves results in money supply in the country change (Fig. 1.6) [123, p. 413].

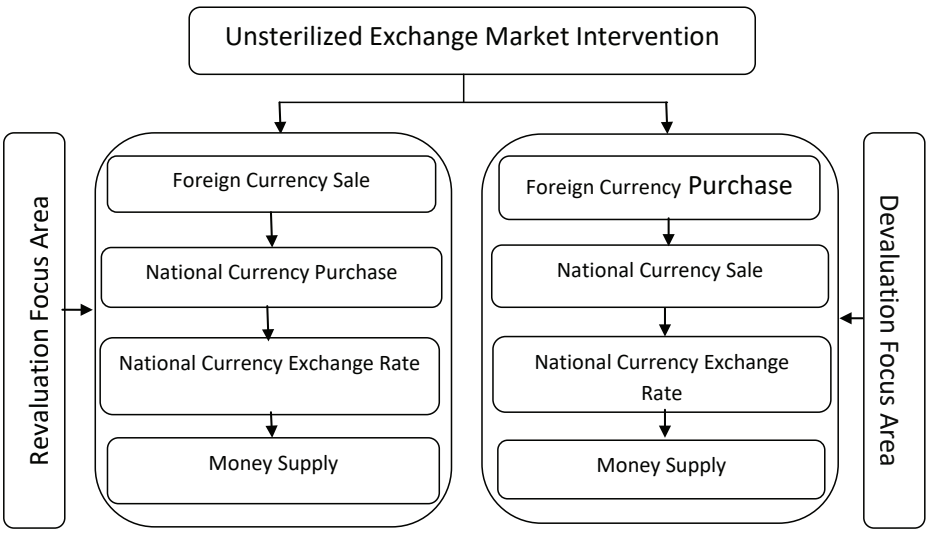

Fig. 1.6. Mechanism of Foreign Exchange Policy through Unsterilized Intervention Implementation [123, p. 413]

Sterilized exchange market interventions are interventions in which the change in the National Bank foreign assets is offset by a corresponding change in its domestic assets. For example, in order to avoid excessive and unpredictable growth in money supply, and hence the surge in inflation caused by the national currency in the foreign exchange market of the country sale, the Central Bank must reverse the transaction with domestic assets, which may be represented by Government securities [143, p. 696].

In such a case, Government securities should be sold on an open market to withdraw excess money supply. This will eliminate the effect of money supply increase due to interventions. As a result, the total foreign currency assets will increase and the total investments in Government securities will decrease in the Central Bank assets structure. Conversely, when carrying out exchange market intervention to sale the foreign currency in exchange for the national currency,

the Central Bank can purchase securities on the open market, which will result in the same money supply that has been withdrawn from circulation as the result of the intervention (Figure 1.7) [123, p. 413].

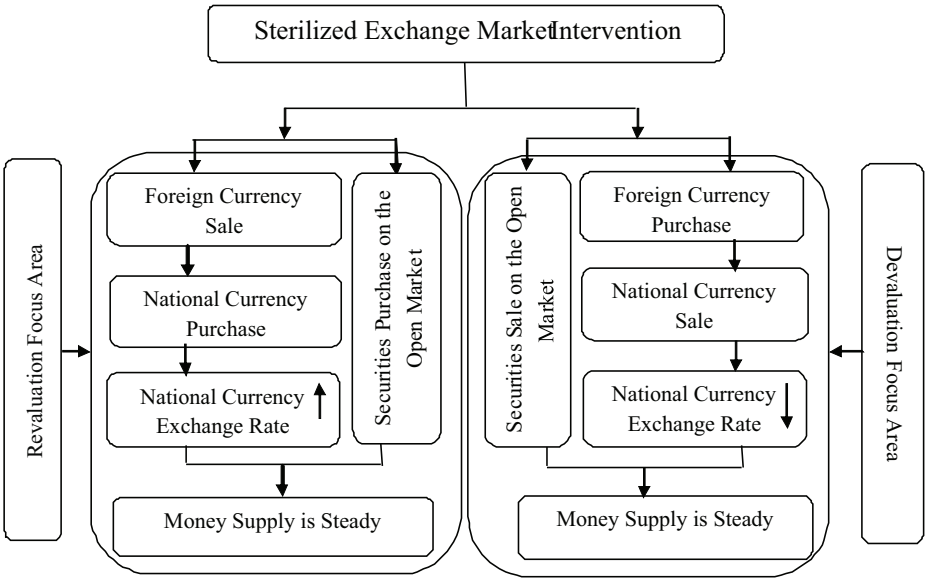

Fig. 1.7. Mechanism of Foreign Exchange Policy through Sterilized Intervention Implementation [123, p. 413]

Exchange market interventions are used to maintain national currency exchange rate at a reduced level for currency dumping implementation. Currency dumping is national currency devaluation aimed at the share of goods export increase at the prices that are below the world prices. Currency dumping is a means of selling races. The main condition here is the national currency rate devaluation in larger amounts than its purchasing power decline on the domestic market. Currency dumping is characterized by:

1) An exporter, when purchasing goods on the domestic market for the national currency purchased at the current exchange rate, sells them on the foreign market for foreign currency at prices below the world average;

2) Export prices decrease source is the exchange rate difference arising from foreign currency proceeds at the national exchange rate, which will increase during the given period;

3) Export of goods on a massive scale provides exporters excess profits, dumping price may even be below the production price or cost, but the too

understated price is disadvantageous for the exporters, since competition with national goods may occur as a result of their re-export by foreign contractors [38, p. 277-278].

Central Banks reports indicate that the key factors influencing interventions effectiveness are:

– Joint, coordinated with other Central Banks interventions;
– Intervention amount in relation to the foreign exchange market trading volumes;
– Interventions regularity (large infrequent interventions are more effective due to the unexpectedness factor enhancement and market confidence to the monetary authorities' determination to maintain the exchange rate strengthening);
– The transaction ordinal number in a series of interventions (the first intervention is always the most effective);
– The transaction combination with current market trend of current uncertainty events and future fundamental factors;
– Insignificant balance of payments imbalance (only then exchange market interventions are effective);
– Official foreign currency reserves level – reserves scarcity requires their renewal, so foreign currency sale should be alternated with its purchase [180, p. 67].

An important condition for an exchange market intervention implementation is sufficient gold and foreign currency reserves accumulation – a kind of insurance against adverse external or internal factors that contribute to the country financial stability preservation in the long term. It should be borne in mind that foreign currency reserves application for exchange market interventions to repurchase currency for balance between inflation and deflation maintaining causes risks associated with increased inflationary pressures and maintenance of the economy structural imbalances. Thus, exchange market interventions policy should be organically combined with other monetary and fiscal policy tools aimed at achieving the specified economic growth, inflation rates and balance of payments indicators.

The next currency exchange rate regulating tool is currency devaluation and revaluation. This tool essence is in activities of the National Bank officially aimed at the national currency exchange rate changing towards its reduction or increase. Currency devaluation is deliberate actions of the relevant institutional structures aimed at the national currency exchange rate against other currencies depreciation. Currency revaluation is the national currency official exchange rate against other currencies appreciation [1, p. 176].

Official (open) and nonofficial (hidden) devaluation and revaluation are distinguished. In an open devaluation context, the country's Central Bank officially reports national currency devaluation, depreciated paper money is withdrawn from circulation or exchanged for new, sustainable credit money (at the appropriate exchange rate before the old money depreciation, that is, lower). In case with a hidden devaluation, the Government decreases the monetary unit real value against foreign currencies without withdrawing the depreciated money from the circulation. Such a state policy in itself should not result in lower prices for goods and services, as in open devaluation case. The generally known paradigmatic formulas for devaluation and revaluation calculation (1.3) and (1.4) are considered ordinary mathematical measurement of the exchange rate increase or decrease in percentage terms [103, p. 192].

Devaluation calculation in percentage terms is carried out by the formula (1.4):

$$D = \frac{\mathrm{ERo} - \mathrm{ER1}}{\mathrm{ERo}} \cdot 100\%, \tag{1.4}$$

Revaluation calculation in percentage terms is carried out by the formula (1.5):

$$R = \frac{\mathrm{ER1} - \mathrm{ERo}}{\mathrm{ERo}} \cdot 100\%, \tag{1.5}$$

where D (R) is devaluation (revaluation) percentage;
ERo – national currency official exchange rate before devaluation (revaluation);
ER1 – national currency official exchange rate after devaluation (revaluation).

Revaluation and devaluation are an integral part of an emerging economy, they act as the exchange rate regulating tools provided that sufficient gold and foreign currency reserves are available.

Another currency regulation tool is the exchange rate regime regulation, that is the Central Bank activities aimed at establishing the procedure of the national currency exchange rate against foreign currencies determination and change [23, p. 159]. As noted, three basic exchange rate regimes are distinguished: fixed exchange rate regime; floating exchange rate regime; mixed exchange rate regime.

The Hryvnia exchange rate regulation is a very important and meaningful measure and should depend on the specific situation in the country, taking into consideration strategic objectives of its development. In determining the

exchange rate regulation system, the National Bank of Ukraine tries to keep the Hryvnia stability under control, which is one of the main NBU objectives in accordance with the Law of Ukraine "On the National Bank of Ukraine" [137], since the national monetary unit exchange rate fluctuation ambiguously affects the pattern of current account positions.

It seems that in current complex socio-economic and political circumstances one of the main currency regulation tools in Ukraine should be gold and foreign currency reserves management, since, clearly defined objectives of foreign exchange policy and sufficient available foreign currency reserves (adequate gold and foreign currency reserves) are essential for foreign exchange policy based on exchange market interventions. In quantitative terms, total liquid international reserves should correspond to the total money supply in the country and exceed the expected during the year external debt servicing [180, p. 68].

Gold and foreign currency reserves are reserves of the country, including assets defined by global and international cooperation as international and intended for international settlements [152, p. 410]. Typically, this tool is applied to sell volatile currencies and purchase more stable currencies as well as the currencies required for international settlements and interventions.

The Law of Ukraine "On the National Bank of Ukraine" clearly indicates that in order to regulate the exchange rate of the Hryvnia against foreign currencies, the National Bank shall employ gold and foreign currency reserves, purchase and sell securities, establish and modify refinancing rate, and apply other tools to regulate money supply [137]. The Resolution of the National Bank of Ukraine "On the Official Foreign Exchange Reserves and Foreign Exchange Transactions of the National Bank of Ukraine" refers to gold and foreign currency reserves intention, namely to the fact that the National Bank of Ukraine in accordance with current legislation shall form official foreign currency reserves for interventions in the foreign exchange market transactions to influence the exchange rate of the national currency against foreign currencies in a specified direction through foreign currency purchase and sale [138]. Thus, the facts confirm that gold and foreign currency reserves management is one of the main tools of the currency exchange rate regulation.

The next group of tools of direct impact is administrative methods of the currency exchange rate regulation, which includes foreign exchange restrictions, currency blockade, and balance of payments regulation. Currency restrictions are the most common tool. Currency restrictions is a system of regulations established in the legislative and administrative procedure and aimed at eliminating transactions with foreign and national currency, gold

and other currency funds on the market and provide for their submission to the treasury [38, p. 253]. Currency restrictions are a fairly expedite tool of monetary and exchange rate regulation, they can be promptly established and canceled depending on the foreign exchange market situation.

Currency restrictions are used for balance of payments equilibration, national currency exchange rate regulation and official gold and foreign currency reserves outflow curbing. In currency restrictions context, official setting of several exchange rates is widely practiced. It is used as one of the means of goods exports stimulating and import restricting, as well as revenues regulating and foreign currency through other channels attraction. Currency restrictions rigidity depends on a particular currency situation in the country. Developed countries have been deviating from currency restrictions practice in recent years, while emerging and transition economies actively employ them [82, p. 177]. Traditionally the following components of currency restrictions are distinguished in scientific literature:

– Mandatory foreign currency sale to the State;
– Banning of foreign currency free sale and purchase;
– Special terms for transfers and payments abroad and foreign loans obtaining;
– Restrictions on the export of capital;
– Restrictions on the individuals' rights to possess and handle foreign currency [88, p.166].

The need to certain currency restrictions application is predicated primarily by the overall economic situation in the country, as well as foreign exchange market functioning peculiarities. Thus, currency restrictions are of unilateral legal-government regulations nature characterized by the state coercion attributes.

Currency blockade is the next exchange rate regulating method. Currency blockade is a system of economic sanctions in the form of currency restrictions imposed by a country or group of countries on another country in order to prevent its currency values application to implement certain economic or political demands. Currency blockade is a type of economic blockade. Currency blockade include such measures as: the account blocking; credit blockade; currency restrictions [152, p. 408-409].

The process of currency blockade implementation can be performed in the following basic forms: 1) the country foreign exchange values kept in foreign banks blocking via deprivation the account holders of the right to freely dispose of the funds; 2) foreign aid to the state government termination; 3) a ban on investment projects on the territory of the country implementation for the

national companies, that is, the currency blockade subject introduction; 4) loans rejection, including international monetary organizations loans [184, p. 234-235]. Currency blockade should be comprehended as a totality of mandatory currency measures applied by certain states against others to restrain certain requirements fulfillment.

Administrative methods include balance of payments regulating mechanism as well, that is application of export subsidies, customs tariffs and insurance against losses caused by currency ratios fluctuations [49, p. 20].

Tools of indirect impact are a totality of levers and methods applied in the State monetary policy to regulate money supply in the country, thus influencing the exchange rate dynamics. Such tools include: discount foreign exchange policy; open market policy; mandatory reserves policy.

Discount policy is one of the methods of impact. A system of economic and organizational measures used in the discount rate (percentage) application when regulating investment and balancing payment obligations is interpreted as the discount policy. This policy is primarily aimed at the exchange rate adjustment to regulate cash flow, prices dynamics and levels, total money supply and short-term assets migration [158, p. 82]. The Central Bank discount policy is of significant impact on the country economic situation, it provides information as to the future monetary policy. The discount rate hike is often a prerequisite for the economic growth rate slackening. Central Banks ratchet discount rates upward to keep excessive growth in discount loans. This situation occurs in the event of market interest rates relative to discount rates growth when the discount loans level increases significantly, thus the Central Bank is forced to balance the interest rates. In this case, the discount rate ratchet upward would not indicate the Central Bank intention to pursue a restrictive monetary policy. The discount rate change is not an effective method of controlling money supply in the country [101, p. 520].

The main discount policy techniques are account (discount) rates regulation (increase or decrease) to influence loan capital demand and supply, exchange rates, as well as the country balance of payments. The discount rate ratchet upward is aimed at reducing the amount of loans granted by the National Bank of Ukraine to commercial banks (credit restriction), and hence in the money supply decrease, currency reserves and national currency exchange rate maintaining and foreign capital inflow stimulating. The discount rate reduction, on the contrary, encourages the loans granting (credit expansion). This determines production volumes expansion, foreign capital outflow, and money supply growth.

To maintain the national currency stability, the National Bank employs mandatory reserves policy as an indirect influence method. The impact on the money supply is performed through the rates of banking reserves manipulation that commercial banks must hold in custody on the Central Bank accounts. Certainly, holding significant funds in the form of reserves is an obvious loss for a commercial bank, since these funds being loaned could make significant profits. However, reservation practice is essential for maintaining liquidity and insuring the entire credit system from bankruptcy. Whereas a need to decrease aggregate demand and reduce investments level arises, the Central Bank increases mandatory reserves rate. This results in credit facilities of commercial banks decrease. In consideration of the reserve requirements characteristics the Central Bank pursues a policy aimed at the rate of reserve requirements decrease to stimulate investment activity, while mandatory reserve requirements rate temporary increase under certain conditions causes inflationary pressures decrease and contributes to the national currency stability [15, p. 55].

The state rarely resorts to the reserves requirements rate change, that is this currency regulation tool application requires due diligence. As a consequence, the most efficient and commonly employed indirect impact lever is open market transactions. The open market transactions essence is government securities purchase and sale by the Central Bank. In case if the economy is in a recovery phase (the population aggregate income is maximum and unemployment rate is minimum) propensity to investment and aggregate demand decline should be ensured to eliminate the market situation imbalance possibility. For this purpose, the Central Bank sells government securities; as a result of the securities sale withdraws money from circulation and narrows money supply, increasing the national monetary unit relative value. If the economy is in the doldrums, as incomes and employment are at a low level, the Central Bank starts purchasing government securities. This means that the State stimulates aggregate demand and business activity revival by resorting to economic expansion policy. Securities repurchase by the Central Bank extends the banks resource base, which results in money supply growth and national currency devaluation [15, p. 54; 49, p.19]. As a result of open market transactions, the State stimulates economic growth and positively affects the exchange rate regulation.

Based on the foregoing, it can be argued that the national currency exchange rate State management is an important process in struggling economies for the country's economy on the way toward the national currency stabilization and macroeconomic indicators improvement. The analysis of the State currency exchange rate regulation tools made generalized classification

of currency regulation tools presentation and tools to stabilize the national currency exchange rate identification possible. To stabilize the national currency exchange rate, the Government and the National Bank need decisive actions aimed at complying with the national currency fixed pegging with a band regime as well as successful exchange market interventions conducting. Gold and foreign currency reserves are the basis for the exchange market interventions. Through the exchange market interventions instrumentality, the National Bank of Ukraine influences the exchange rate, thereby pursuing currency stabilization policy of the monetary unit of Ukraine.

Thus, State tools of the national currency regulation are the aggregate of methods and levers through which the exchange rate is affected through actions in currency regulation and controls areas by specific state authorities. Modern trends in certain currency regulation tools in Ukraine application indicate that gold and foreign currency reserves management is the most effective and most significant tool. The national currency stability is achieved only through integrated foreign currency reserves and monetary regulation tools application.

1.3. Gold and Foreign Currency Reserves as the National Currency Exchange Rate Stabilization Tool

Gold and foreign currency reserves formation is an indispensable prerequisite for any state existence and functioning, since they ensure a number of its most important functions achievement, namely: ensure independent from external factors monetary policy implementation through the national currency exchange rate stabilization and regulation. Alternatively, gold and foreign currency reserves can be directed towards the state external debt repayment as required, while maintaining foreign partners' confidence in the State's endowments to meet its liabilities and create conditions for the foreign trade development [10, p. 95].

According to the IMF official documents, official gold and foreign currency reserves management is a process that ensures the State official foreign assets at the disposal of relevant authorities and under their control availability to address the corresponding issues faced by the country [190]. Hence gold and foreign currency reserves management can be defined as an institutionally organized State management process aimed at the existing gold and foreign currency reserves preservation, accumulation and efficient application to

regulate the state economic development indicators and stabilize the national economy as a whole.

Gold and foreign currency reserves of Ukraine management is an integrated part of the National Bank monetary policy, which directly affects the possibilities to efficiently apply basic tools of foreign exchange regulation and the exchange rate regime implementation [72, p. 284]. Gold and foreign currency reserves management means the state management process seen not as the National Bank separate function, but as an aggregate measures applied by the Government through specially created institutions.

In modern literature, gold and foreign currency reserves definition is limited to the fact that it is state-owned currency assets including gold and international means of payments, which can be applied for regulatory and other needs of general economic importance [1, p. 158; 167, p. 528]. The legislation of Ukraine (Law of Ukraine "On the National Bank of Ukraine") defines gold and foreign currency reserves as reserves of Ukraine, reflected in the balance sheet of the National Bank of Ukraine, including assets recognized by the international community as international and intended for international settlements [137]. In the Economic Encyclopedia gold and foreign currency reserves are treated as foreign currency and gold reserves disposed by the State financial authority or Central Bank, as well as international financial and credit institutions for international settlements and payments [112, p. 63]. These needs determine gold and foreign currency reserves accumulating objectives, the main of which are:

– Providing the country with sufficient supply of international means of payment so that the State, its separate structures and non-state economic agents can settle their external liabilities. This is the so-called transactional gold and foreign currency reserves prescription aimed at relations between the national and the global economy maintenance. In this prescription they serve as liquid funds reserve ensuring the country solvency on the global market;

– Providing opportunities to intervene on the foreign exchange market and money market to maintain the national currency demand and supply and exchange rate at their desired level. This is the so-called intervention reserves prescription aimed at supporting national currency internal and external value [10, p. 96-97].

These objectives achievement depends on total gold and foreign currency reserves sufficiency and their application mechanism effectiveness. In that context, a number of problems regarding this regulatory tool application arise, namely: the problem of total gold and foreign currency reserves optimization,

the problem of their intervention implementation, the problem of reserves placement, etc. [38, p. 302-303].

As evidenced by definitions and objectives, gold and foreign currency reserves take on enormous importance in the country's economy and have special prescription in the national currency exchange rate regulation. The gold and foreign currency reserves prescription is international trade-economic and credit-financial relations, implemented at the state level, with the proper means of payment amount provision, balance of payments deficiency payment as well as the National Bank of Ukraine foreign exchange policy implementation through foreign currency on the foreign exchange market intervention [167, p. 528-529]. In accordance with the current legislation of Ukraine, the National Bank of Ukraine shall accumulate official gold and foreign currency reserves for the foreign exchange market interventions according to the indicated guidelines to influence the exchange rate of the national currency against foreign currencies through foreign currency purchase and sale [138]; official foreign exchange reserves shall be formed, held in custody and used by the National Bank of Ukraine to maintain the Ukrainian currency (exchange) rate [140]. Consequently, gold and foreign currency reserves are intended to protect the national currency.

Uniform approach to gold and foreign currency reserves system of Ukraine definition is not presented in the legislation, but by analyzing this category legal nature, the following funds can be included:

1) State Currency Fund of Ukraine;
2) State reserves of precious metals of the monetary group and precious stones;
3) State Currency Fund of the Government (the Cabinet of Ministers of Ukraine currency funds);
4) Gold and foreign currency reserves of the National Bank of Ukraine, which are based on the Bank official foreign currency reserves [137; 138; 139].

In the current legislation the finances fund is only defined as gold and foreign currency reserves. Such legal provisions uncertainty and dispersion obviously do not contribute to their proper application. Another problem is the lack of detailed regulation of the executive officers' rights and responsibilities regarding gold and foreign currency reserves management [67, p. 81]. Gold and foreign currency reserves as centralized government finances are not systematically implemented in the legislation.

Gold and foreign currency reserves structure largely depends on characteristics of the global monetary system elements available in a given historical period, international settlements peculiarities, importance of various

countries in the world trade and international division of labor. In terms of the Gold Standard functioning (Paris system), most of the official reserves formed by the Central Banks were accounted for by gold, which acted not only as a means of international payments, but as a major asset that served as a collateral for domestic banknote circulation in the country. The Genoa currency system initiated a more active foreign currencies accumulation in gold and foreign currency reserves structure – mainly by swapping gold for exchanges – US Dollar, British Pound and French Franc. With Bretton-Woods monetary system creation the US Dollar took dominant position in both world trade and foreign currency reserves structure. Due to the Western Europe and Japan growing importance in the world trade, adequate changes reflecting the multilateral standard of the Jamaican system occurred in the official currency reserves of the Central Banks. Along with the US Dollar, more stable European currencies were also included in gold and foreign currency reserves structures [167, p. 529].

Today, Central Banks reserves structure is largely determined by assessment economic development prospects in the United States and Western Europe, which affects the share of, respectively, the US Dollar and the Euro in gold and foreign currency reserves structure. Gold and foreign currency reserves in modern countries consist of four basic components. Official foreign currency reserves of Ukraine consist of four components as well (Fig. 1.8).

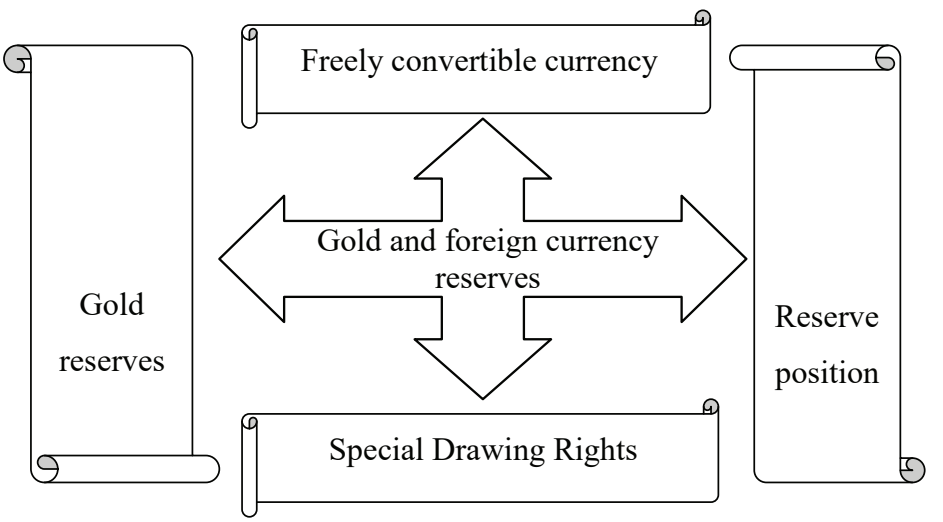

Fig. 1.8. Composition of Gold and Foreign Currency Reserves of the National Bank of Ukraine (developed by the authors based on [114]).

Gold and foreign currency reserves basis is reserves of freely convertible foreign currencies. Convertible currency is legally fixed convertibility of the national monetary unit, its possibility to be exchanged for foreign currency by all interested persons. Such reserves are in the form of: balances on correspondent and current accounts in foreign banks, short-term bank deposits, liquid financial market instruments such as treasury bills, short-term and long-term government securities and various debt instruments that are not traded on the market and are the result of the country with Central Banks and government organizations in other countries official transactions [152, p. 412].

The National Bank of Ukraine report provides the following foreign currency reserves structure (in convertible foreign currencies):

1) Securities;
2) Currency and deposits:
   - In other Central Banks, the Bank for International Settlements and the IMF;
   - In banks headquartered in the reporting country;
   - In banks headquartered outside the reporting country [114].

The main reserve currencies are the U.S. Dollar and the Euro, which characterizes the current monetary system as bi-currency. The financial crisis has demonstrated its instability; the US Dollar instability in recent years has reduced its credibility on the part of economic agents, which has resulted in decrease in demand for this currency to be used as a means of saving and encouraged exporting countries to develop measures to protect against losses in mutual settlements.

The problem of confidence in the US Dollar deterioration and in this regard possible changes in the existing currency system has already been researched by many authors, at this their opinions are divided. O. I. Baranovski, A. L. Kostin, A. B. Kobyakov, O. N. Kondratiev, M. L. Khazin argue in favor of monetary system into a poly-currency system transformation by decreasing the U.S. Dollar importance in the global economy [32, p. 24]. A. S. Galchinsky, who believes that only one of the currencies must act as the world money, is another point of view supporter [33, p. 176].

It should be noted that freely convertible currency can be held in custody in several ways with the diversification aim. In Ukraine it is:

1) Cash on correspondent and current accounts in reliable foreign banks;
2) The National Bank of Ukraine requirements for non-residents in the form of short-term deposits;
3) Market liquid financial tools – securities issued by non-residents [90, p. 96].

The next gold and foreign currency reserves component is gold. For the National Bank gold reserves can act as the reserve of international means of payment for public authorities, private companies, corporations and individuals. The National Bank regulates total precious metals reserves in absolute and relative terms, as well as determines their replenishment formation sources and means of these reserves realization and their profitability and liquidity ensuring. Determination of the necessary for the state share of precious metals in gold and foreign currency reserves is within the National Bank's management competence [138].

Main characteristics of gold as a reserve asset are as follows: firstly, gold provides the state financial security in the event of adverse conditions such as crisis, currency system destruction, war and terrorist acts. Secondly, gold is not a debenture, it does not depend on currency control or assets in a certain currency blocking, that is, it does not depend on the factors affecting reserves in foreign currency. Gold is used to settle liabilities between governments, it is easy to mobilize and to use as collateral. Thirdly, gold promotes official reserve assets diversification. It should be noted that gold and foreign currency reserves structure formation in Ukraine is under the world monetary system development influence. Gold demonetization and Central Banks needs in generating revenues from gold and foreign currency reserves management growth stipulate a low average specific weight of the metal in gold and foreign currency reserves of both IMF member states and the National Bank of Ukraine [164, p. 426-427].

Another gold and foreign currency reserves component is reserve position. Reserve position in the IMF is determined as the difference between the quota of Ukraine in the IMF and deposits in national currency. When the national currency of Ukraine is employed by the IMF, its reserve position is increased. Due to the limited use of the Ukrainian Hryvnia on the international accounts, reserve position of Ukraine is weak [40, p. 61].

Special Drawing Rights are included to gold and foreign currency reserves as well. According to the Law of Ukraine "On the National Bank of Ukraine", Special Drawing Rights (SDRs) are an international reserve asset created by the IMF to supplement the existing international reserve assets, which is a "basket" of four currencies, the composition of which is reviewed every five years [137]. Special Drawing Rights are not cash, but a reserve asset and an IMF accounting unit that can be exchanged for freely convertible currency when required. SDR value is determined daily on the basis of market rates weighted average of such currencies as: US Dollar, Euro, British Pound, Japanese Yen. Special Drawing Rights are included in IMF member states official reserves, which guarantees

them the right to receive a share of the paid funds in financial difficulties event, but subject to free cash and the Fund sanction availability [171, p. 548].

Regarding national currencies value ratio, the SDR as an international settlement currency unit is used for determining international requirements and liabilities relative scale value, currency parity and the exchange rate settlement. Conditions for the SDR introduction was created in the context of negative consequences of application unstable national currencies as the world money in the process of gold demonetization (its monetary functions abolition, legally executed by the Jamaican Currency Agreement in 1976); the SDRs as a form of the world money is used for cashless international settlements by records on special accounts in the International Monetary Fund. The IMF provides each of the more than 140 IMF member states with a specific amount of SDRs proportional to its respective quota in the Fund. The quota calculation is based on the Gross National Product. Each IMF member state is obliged to confirm its SDR by income and borrowing capacity of its government accepting them in exchange for convertible currencies [177, p. 20-21].

Gold and foreign currency reserves are reflected on the National Bank balance sheet. Foreign currency reserves structure is determined and approved annually by the decision of the Board of the National Bank of Ukraine. Four sources that form the official foreign currency reserves are available in Ukraine, they include:

1) Internal funds;
2) Attracted funds;
3) Borrowings in accordance with agreements concluded by the National Bank of Ukraine and the Cabinet of Ministers of Ukraine with the International Monetary Fund and other international financial institutions;
4) Emission funds within the total emission level limits approved by the Verkhovna Rada of Ukraine upon the National Bank of Ukraine and the Cabinet of Ministers of Ukraine submission [152, p. 411].

Total foreign exchange reserves depend on the foreign trade status, balance of payments equilibration, currency restrictions regime, investment environment, interventions policy nature and exchange-rates regime. Depending on the currency source, gross foreign currency reserves and net reserves are distinguished. Gross foreign currency reserves are composed of internal and attracted funds. Net foreign currency reserves include internal funds only [152, p. 411]. Internal and attracted funds structure is presented in Appendix C.

Foreign currency reserves placement is important for insurance against devaluation and additional revenues and volumes expansion. Gold and foreign

currency reserves are held in several most stable currencies widely used as international means of payment; one currency reserves are periodically converted to another in case if devaluation of one or appreciation of another is expected. Foreign currency reserves are held on high-yield deposit accounts in the most reliable non-resident banks. A certain part of them is placed in high-yield securities of reliable issuers, in particular in the short - and long-term commitments of the US Government and other Governments. A small share of the reserves may be held by Central Banks in cash to meet current cash demand on the domestic market [38, p. 308].

The National Bank of Ukraine generally applies the following forms of foreign currency reserves placement:

– Currency deposits in foreign banks;
– Foreign exchange (Forex) transactions;
– Free currency funds placement in securities [1, p. 187].

Necessary element of the monetary policy associated with official gold and foreign currency reserves of the country formation and management is their optimal structure determination. The issue relevance is particularly increased due to the latest trends of the leading world economies development, financial markets instability, significant exchange rates fluctuations, which have significantly worsened the economic situation in Ukraine. Optimal ratio of gold and foreign currency reserves of the country is a crucial task.

The National Bank forms the country national treasury and organizes its activities, maintains reserve banknotes funds, precious metals and gold and foreign currency reserves level. The National Bank accumulates gold and foreign currency reserves, which are credited to the National Bank balance [75, p. 343]. The State Treasury is a structural unit of the NBU Central Office which is designed to accumulate and hold reserves of precious metals and other valuables in custody, and carry out corresponding operations for gold and foreign currency reserves of the National Bank of Ukraine augmentation. The State Treasury main functions and responsibilities include the following:

1) Accumulation, accounting and custody of precious metals and stones and other valuables reserve stocks to ensure gold and foreign currency reserves of Ukraine accumulation and National Security Information on their stocks provision;
2) Purchase and sale of (monetary) precious metals and stones and articles thereof and other values on the territory of Ukraine and abroad according to the National Bank of Ukraine decision;
3) Execution of the Board of the National Bank of Ukraine decisions on operations on precious metals in accounts and deposits with foreign

banks placement and other transactions with precious metals conduct in accordance with international banking practices;

4) Proposals to the National Bank of Ukraine on granting licenses to commercial banks for transactions with precious metals and stones drafting;
5) Conducting settlements with enterprises, institutions, organizations for the purchased or sold precious metals, stones, etc. within the funds limits allocated by the National Bank of Ukraine;
6) Precious metals salvage transfer to the plants for refining and processing and ensuring these metals ingot bars return of the State Treasury after the refining;
7) Precious metals and stones purchase and sale prices projects development [110, p. 242].

Reserve currency choice is an important issue affecting gold and foreign currency reserves formation and custody. Official gold and foreign currency reserves structure of most countries is dominated by foreign currency reserves reflecting the reserves formation liquidity principle in accordance with the intended objective. Under these optimal conditions, a particular currency or group of currencies choice for official foreign currency reserves formation is one of the main objectives of the Central Bank monetary policy.

The reserve currency performs several functions in the international financial relations system, namely:

1) The country international liquidity provision;
2) Reserves cost stabilization;
3) Objectives of the currency exchange rate policy implementation through the exchange market interventions.

Considering functional stress, the reserve currency is subject to the following requirements: the currency issuing country should occupy leading positions in the international economy; apply liberal national currency legislation; the reserve currency should be actively used in transactions carried out by international financial institutions (commercial and official). The need for international liquidity requires such a currency exchange rate stability, since its unpredictable devaluation results in currency reserves devaluation and poses a threat to the global monetary system stability, both at national and global levels. Reserve currency in international trade application involves: foreign trade transactions servicing; capital international flow provision; prices in foreign trade transactions expression; a base for expressing exchange rates of most currencies of other currencies application; exchange market interventions mechanism ensuring [159, p. 50].

These conditions do not always function in complex (like for the US Dollar and the Euro) for all currencies. For instance, the Swiss Franc is not a foreign trade transactions currency, but is used as a reserve currency, since the Swiss banks mobilize significant funds and provide reliable capital placement. The Pound Sterling, despite the UK importance in the world markets diminution, retains the reserve currency role given the country's worldwide well-developed banking network [55, p. 72-74].

An important issue affecting gold and foreign currency reserves efficiency is their management. Gold and foreign currency reserves management is conducted by the National Bank, which performs the reserves accumulation, placement, as well as optimal structure and level determination. Gold and foreign currency reserves management objective is ensuring maximum efficiency of their application. This objective achievement requires analysis and justification of actions in the following areas by the currency regulation authorities. Firstly, there is a need to determine the optimum total volume of international means of payment for the given conditions. Reserves level excessive reduction resulting from a long-term balance of payments deficit, may result in the country's failure to satisfy its vital needs through imports or servicing external debt liabilities. Reserves excessive growth resulting from attracted revenues over expenditures permanent predominance contributes to the national money supply growth, i.e. stimulates inflation, as well as results in funds inappropriate outflow from production to monetary sector. Secondly, there is a problem of the ratio between the reserves individual components choice, as well as the ratio between foreign currency and gold fixing. Thirdly, assets should be rationally placed abroad. Fourthly, the National Bank and the Government of the country face the challenge of the currency stock diversifying, a currency basket formation, that is, specific currencies choice and their ratio in this stock setting. The problem relevance is determined by the transition from the "dollar standard" to "multi- currency standard" trend [110, p. 244-246; 152, p. 414-415].

Gold and foreign currency reserves management should be aimed at the national currency exchange rate stabilization. For this reason, organizational-economic mechanism of gold and foreign currency reserves management cannot be confined to the National Bank of Ukraine framework. General organizational chart of gold and foreign currency reserves of Ukraine management, which involves all major state institutions interaction, is presented in Fig. 1.9.

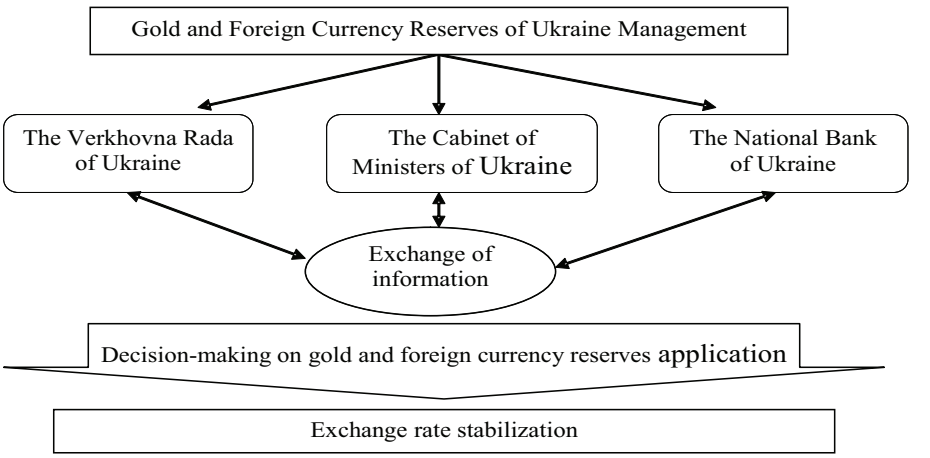

Fig. 1.9. Gold and Foreign Currency Reserves of Ukraine Management Chart (developed by the authors)

Efficiency in gold and foreign currency reserves management will be achieved only with the Government and the National Bank full collaboration. The collaboration result is efficient gold and foreign currency reserves application and the national currency exchange rate stabilization. Such collaboration advantage for the Government is the fact that upon the national currency stable exchange rate achievement successful domestic reforms implementation will become possible.

Strategic areas of foreign currency reserves management choice depend on the specific economic situation and a number of factors, namely: monetary policy, inflation rate, state debt, etc. Within gold and foreign currency reserves replenishment strategy implementation framework, the National Bank may apply derivative financial instruments to achieve the following objectives:

1) Credit exposure reduction and liquidity increase due to futures contracts instead of deposits in the portfolio management process application;
2) Arbitrage by the amount equivalent to the risk of cash collateral and futures contracts amount purchase and sale with the aim to profit from short-term prices fluctuations;
3) Profitability improvement through synthetic securities creation, or by the portfolio items hedging;
4) Levers of profitability position and duration regulation improvement [92, p. 141].

On account of terms, foreign currency reserves are divided into the following types: short-term (up to 3 months); mid-term (from 3 months to

3 years); long-term (from 3 to 6 years) [114]. Assessing the tools for foreign currency reserves managing the National Bank is guided by the following basic criteria: liquidity, profitability and state guarantees availability [69, p. 15].

Gold and foreign currency reserves influence the state monetary security as well. The state monetary security is its foreign currency funds supportability degree sufficient to meet the balance of payments surplus, international liabilities commitment, necessary level of foreign currency reserves accumulation, the national currency stability maintaining, and the exchange rate, which creates optimal conditions for domestic exports sustained development, foreign investment large-scale influx, Ukraine's integration into the global economic system and protect against shocks on the international currency markets. Financial mechanism for gold and foreign currency reserves formation involves determination of investment tools structure of which the gold and foreign currency reserves will be formed [11, p. 139].

Gold and foreign currency reserves investment structure varied in parallel with changes in the global monetary system. With the Jamaican currency system in the mid-1970s introduction Central Banks of industrialized countries started their reserves diversification by forming them in the form of short-term governmental bonds. Over the time, when reserves levels allowed investing in riskier assets, long-term securities and derivatives began to appear in the Central Banks assets. Gold and foreign currency reserves are invested even in shares in some countries. Among gold and foreign currency reserves financial tools mid- and short-term fixed income tools of the securities market, and deposits are used in Ukraine [92, p. 137-138].

term structure of the official currency reserves of the National Bank definition depend on the country economic situation. In stable economic development conditions according precedence to profitable and riskier term reserves structure is possible, and vice versa – in a period of economic instability less profitable and less risky official reserves structure should be developed. In most cases, liquid short-term assets in foreign currency reserves structure amount to about half of the total reserves in the developed countries (these countries are characterized by significant official foreign currency reserves levels at low intervention activity) and amount to almost 100% in transition economies (due to these countries economy instability and the need for frequent exchange market interventions, the volumes of which are difficult to predict) [1, p. 186].

Taking in consideration the foregoing, it can be argued that one the National Bank of Ukraine and the state governing bodies priority is modern

efficient system of the country gold and foreign currency reserves management creation, since at their growth expense the national currency exchange rate stabilization can be affected through exchange market interventions. The main task of the National Bank towards gold and foreign currency reserves strengthening and accumulating is their optimal structure formation. Analysis of the modern structure of Ukraine's reserves makes it possible to conclude that they are imperfect, and their diversification level is the main problem. Proper structure of gold and foreign currency reserves formation by the National Bank will enable it to properly execute its own functions on foreign exchange relations regulation, primarily in terms of maintaining the national currency external stability and balance of payments equilibrium. In addition, foreign currency reserves are an important component of the issue-grade mechanism, and are one of the types of national money security in the National Bank assets composition. Optimal structure of foreign currency reserves is also one of the factors that ensures domestic monetary circulation stability and the national currency exchange rate stabilization. One of the objectives of the Government and the National Bank of Ukraine in gold and foreign currency reserves management is creation an efficient system aimed at gold and foreign currency reserves management efficiency.

Conclusions on Section 1

Analysis of the exchange rate formation mechanism problems conducted in the first Chapter of the Monograph has revealed that issues of exchange rate formation and state regulation are relevant, especially in the countries in socio-economic transformations and requiring a balanced monetary stabilization policy development and implementation as a necessary condition for the economic growth; a number of leading economists research, as well as generalized concepts and classifications lack have been explained.

1. The Monograph defines the exchange rate essence as the ratio between monetary units of the two countries used to exchange currencies when foreign exchange and other economic transactions conducting. The fact that exchange rate regimes correct selection, which ultimately has a significant impact on the country economy, is an important issue in the exchange rate setting has been emphasized.
2. 2. Importance of determining factors influencing the exchange rate formation has been justified. Analysis of factors has allowed to determine the factors that are of significant impact on the currency exchange rate in Ukraine. Among all the investigated factors, the national currency exchange rate is affected most by the country's gold and foreign currency reserves level. A secondary criterion which directly affects a monetary unit supply and demand is international trade in goods and services. Classification of the exchange rate affecting factors and separate economic analysis of each of them have confirmed that the national currency exchange rate formation is a complex and multifaceted process that requires further research.
3. 3. The fact that state regulation of the foreign currency exchange rate is an important step towards the national currency exchange rate stabilization has been proved. Its complexity stems from the fact that the national currency exchange rate formation process depends on many factors. Research and economic analysis of the exchange rate formation factors have allowed to distinguish one of the main among the all tools, namely, gold and foreign currency reserves. This tool importance is due to the fact that successful exchange market interventions can be performed through gold and foreign currency reserves instrumentality. Gold and foreign currency reserves as a currency regulation tool is unique since the National Bank of Ukraine and the Government can influence their level by their effective management. Gold and foreign currency reserves legitimate importance in the exchange

rate formation is due to the fact that the National Bank of Ukraine main function is ensuring monetary unit of Ukraine stability. Further, the Law of Ukraine "On the National Bank of Ukraine" clearly states that the National Bank shall employ gold and foreign currency reserves for the exchange rate of the Hryvnia against foreign currencies regulation.

4. 4. The Government and the National Bank of Ukraine importance in gold and foreign currency reserves management, namely their formation and management processes optimization, have been demonstrated. Due to gold and foreign currency reserves increase the national currency exchange rate stabilization can be achieved through exchange market interventions. Gold and foreign currency reserves level improvement can be achieved by creating new, or improving the existing management structure. One of the most important objectives of gold and foreign currency reserves of Ukraine application is their placement. Effective strategy of gold and foreign currency reserves management lack results in their decline and inability to perform basic functions, namely accumulation of sufficient funds for exchange market interventions aimed at the national currency of Ukraine exchange rate stabilization.

Consequently, the issue of gold and foreign currency reserves application to stabilize the national currency exchange rate is relevant and requires further research.

The main provisions of Section 1 are reflected in the authors' following works: [26; 27; 28; 29; 30].

SECTION 2.
ANALYSIS OF GOLD AND FOREIGN CURRENCY RESERVES OF UKRAINE STATUS AS A FACTOR OF THE NATIONAL CURRENCY EXCHANGE RATE REGULATION BY THE STATE

2.1. Analysis of the Exchange Rate Formation Processes in Ukraine and their Interrelation with Gold and Foreign Currency Reserves Level

Currency exchange rate stabilization is important for the Ukrainian economy, as the domestic standards of living depend on the currency exchange rate. Currency exchange rate affects the country's main macroeconomic indicators. An illustrative example is dynamics of the exchange rate of the Hryvnia against the US Dollar and the consumer price index presented in Fig. 2.1 and dynamics of the exchange rate of the Hryvnia against the US Dollar and GDP per capita presented in Fig. 2.2.

The data presented in Fig. 2.1, demonstrate a close interrelation between currency exchange rate and the consumer price index. With the exchange rate of the Hryvnia against the US Dollar appreciation prices increase dramatically: an example is 2008 and 2014. Negative is the dependence that with the exchange rate of the Hryvnia against the US Dollar declines, prices do not decrease immediately, but gradually. Fixed exchange rate, namely fixed pegging with a band regime selection, seems logical for domestic prices stabilization. Due to this selection it is possible to curb the exchange rate surge and thereby decrease the consumer price index growth.

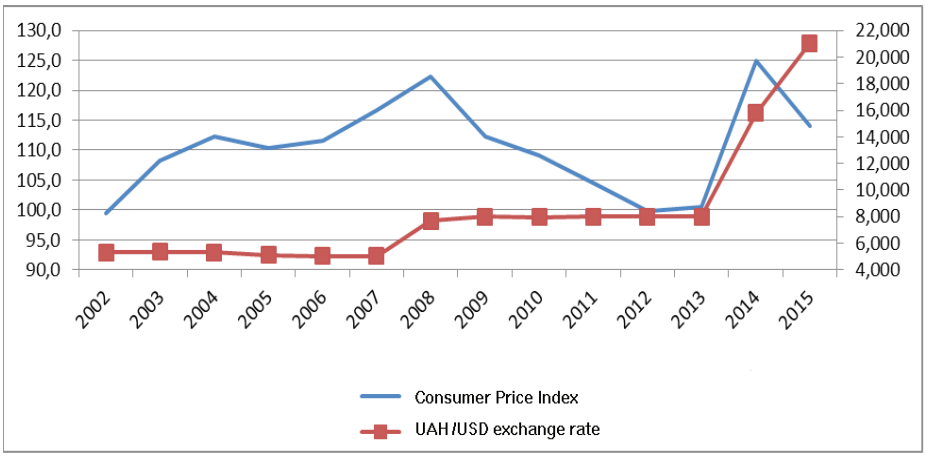

Fig. 2.1. Dynamics of the Exchange Rate of the Hryvnia against the US Dollar and Consumer Price Index in 2002–2015 (developed by the authors according to [102, 108])

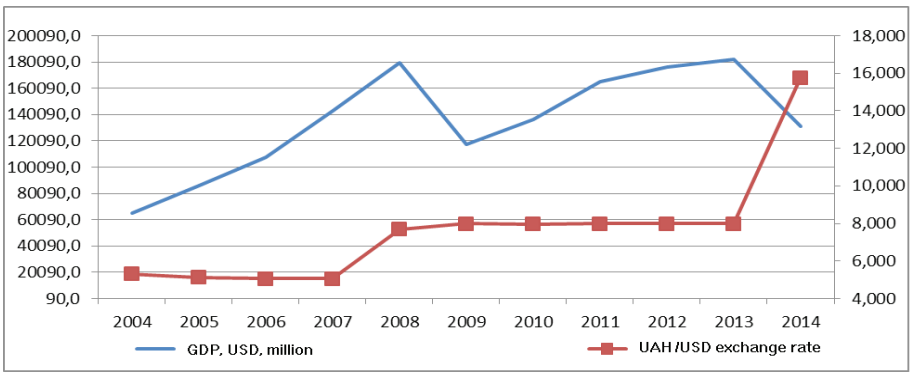

Fig. 2.2. Dynamics of the Exchange Rate of the Hryvnia against the US Dollar and GDP Per Capita in 2004–2015 (developed by the authors according to [102, 108])

The data presented in Fig. 2.2 indicate a close interrelation between currency exchange rate and GDP per capita. With the exchange rate of the Hryvnia against the US Dollar appreciation in 2008 and 2014, the GDP per capita declined sharply. And in the exchange rate stability period, the GDP per capita increased rapidly.

Thus, in transformational transitions conditions one of the most important ways to strengthen Ukraine's economy and prevent macroeconomic indicators deterioration is the state policy of the exchange rate stabilization. The possibility of successful reforms for the State Government emerges only with the exchange rate stabilization.

Currency stabilization should become a priority for the Government, since the interrelation between the exchange rate stability and reforms efficiency, which is confirmed by the experience of many world countries, suggests that this is one of the ways to strengthen the economy and improve domestic social life. In our view, fixed pegging with a band regime selection, as an important tool for the national currency exchange rate stabilization, is effective for the economy of Ukraine.

When fixing the national currency exchange rate and maintaining its stable level through exchange market interventions, the Government of the State will soon be able to stabilize the country's economy and bring its macroeconomic indicators to the proper level. However, exchange market interventions are not possible without the State gold and foreign currency reserves sufficient level. Consequently, the first priority on the way of the national currency exchange rate stabilization is gold and foreign currency reserves of Ukraine level increase.

History demonstrates that an independent Ukrainian banking system was formed after 1991 as a result of the USSR collapse. Ukraine, as a newly formed state, did not have its domestic gold and foreign currency reserves, and hence its management experience, personnel and infrastructure. During the Soviet times, gold and foreign currency reserves management was exclusively a monopoly of the Central Bodies of the State Bank of the USSR and its agent – Vnesheconombank of the USSR. The process of gold and foreign currency reserves management mechanism formation took quite a long period. Four stages of the National Bank of Ukraine gold and foreign currency reserves management evolution are distinguished [117, p. 25-27; 164, p. 427-428].

The first stage (1991– 1992) – the National Bank of Ukraine, which develops methodological foundations to perform the function of precious metals (gold) depository, was created. At this stage, an infrastructure for gold and foreign currency reserves formation and management was created and correspondent relations of the NBU with foreign banks were established. This stage finishes with such institutions as the State Treasury and the NBU Currency Exchange formation. The Law of Ukraine "On Banks and Banking Activity" (March, 20, 1991) and the Decree of the Presidium of the Verkhovna Rada of Ukraine "On Creation a Reserve of Precious Metals and Precious Stones in Ukraine" (December, 2, 1991) adoption contributed to solving the problems of gold and foreign currency reserves formation, which were formed virtually from scratch [164, p. 427-428].

The second stage lasted from 1992 to 1995 (the International Monetary Fund approved lending to Ukraine). Two peculiarities are characteristic for

this stage, namely: active formation of regulatory framework on currency regulation and currency control in Ukraine and the NBU's gold and foreign currency reserves rapid growth due to a share of foreign exchange earnings mandatory sale introduction. The issue of gold and foreign currency reserves custody and effective management was not given enough attention at these stages of the NBU management mechanism evolution [117, p. 26-27].

The third stage (1995–1998) is associated with gold and foreign currency reserves rapid growth through the IMF loans and short-term foreign investments. It should be noted that during 1995–1996 gold and foreign currency reserves level and structure were significantly influenced by the Ukrainian Interbank Currency Exchange and the National Treasury of the NBU activities (throughout the period) [117, p. 26-27].

The fourth stage (from 1998 to the present time) has revealed the existing system of the NBU's gold and foreign currency reserves management insufficiency, in particular: the reserves low liquidity due to the long-term financial tools application; transactions with offshore banks; insufficient level of risk control by the NBU. This stage is also characterized by gold and foreign currency reserves level growth and active policy to improve gold and foreign currency reserves management introduction [117, p. 27; 164, p. 428].

In the process of gold and foreign currency reserves (FX reserves) development, the National Bank of Ukraine faced a problem of strategic and tactical areas for FX reserves management system improvement selection. The problem of gold and foreign currency reserves formation and management has become important for the National Bank of Ukraine, and its solution depends on the monetary unit of Ukraine stability.

Currently, the currency system is mainly influenced by economic factors. Free funds for the national currency stabilization availability is the main factor influencing the exchange rate of the national currency. Such funds are held in foreign currency and gold reserves, which form the state gold and foreign currency reserves structure. A sufficient FX reserves level in the State is necessary for exchange market interventions to stabilize the national currency exchange rate. Foreign currency reserves do not directly affect the exchange rate dynamics, but act indirectly – through creation opportunities for exchange market interventions, thus there is a certain interrelation between them, as is evidenced by the data presented in Fig. 2.3.

The data in Fig. 2.3 provide an illustrative evidence of the clear correlation between the reserves level and the NBU capability to maintain a relatively stable Hryvnia exchange rate, and even fix it at rather long intervals. More

importantly, during the period of the reserves level growth in 2002–2007 the national currency appreciation from 5.326 to 5.05 UAH/USD was observed. In 2007–2008, with a slight decrease in the reserves level, the national currency depreciation from 5.05 to 7.7 UAH/USD occurred, however, this depreciation is not related to the gold and foreign currency reserves level, it is associated with exogenous factors, primarily the global financial crisis. From 2010 to January 2014 the national currency relatively stable exchange rate preservation is observed, as a sufficient level of gold and foreign currency reserves is available. Thus, for example, in 2013 through gold and foreign currency reserves application for the exchange market intervention the National Bank managed to keep the UAH/USD exchange rate at the level of 2012.

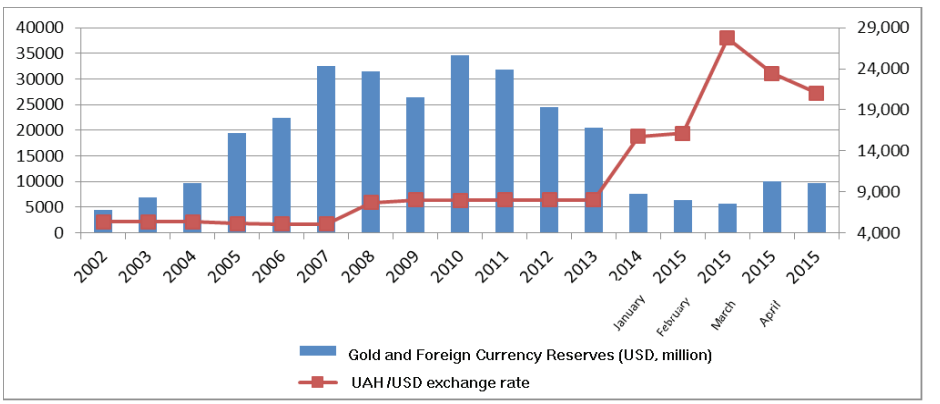

Fig. 2.3. Gold and Foreign Currency Reserves of the National Bank of Ukraine Dynamics and Official Exchange Rate of the Hryvnia against the US Dollar in 2002–2015 (developed by the authors according to [114; 144, p. 54; 145, p. 52; 147, p. 38])

However, in early 2014, a significant decrease in gold and foreign currency reserves was observed; as compared to 2013 they decreased by USD 12,883 million, which resulted in the national currency critical depreciation (to 15.768 UAH/USD). Accordingly, a catastrophic decrease of gold and foreign currency reserves to a critical level of USD 5,625 million in February 2015 resulted in the highest in the record for Ukraine exchange rate level of 27.76 UAH / USD.

Close interrelation between gold and foreign currency reserves levels and the exchange rates dynamics of the Hryvnia against the Euro and the Russian Ruble confirmation is the data presented in Fig. 2.4 and Fig. 2.5, respectively.

The data presented in Fig. 2.4, indicate that in the period of gold and foreign currency reserves level growth from 2002 to 2006, the Euro exchange rate was relatively stable and was kept within the range of 5.5 to 6.6 UAH/

Euro. In 2008, due to economic instability, which was caused by the global financial crisis, the Euro exchange rate appreciation amounted to 11.4 UAH/Euro in 2009 against 7.4 UAH/Euro in 2007. From 2010 to 2013, with gold and foreign currency reserves level decrease due to the National Bank of Ukraine foreign exchange interventions, the Euro exchange rate managed to be kept within the range of 10.3 to 11 UAH/Euro. Since 2014, with gold and foreign currency reserves level dramatic decrease, the rise in the Euro has amounted to 19.23 UAH/Euro, and such a soaring can be explained by the lack of FX reserves for exchange market interventions. As a result of gold and foreign currency reserves for exchange market intervention insufficient level in 2015, the Euro exchange rate spiraled, and peaked at 31.4 UAH/Euro.

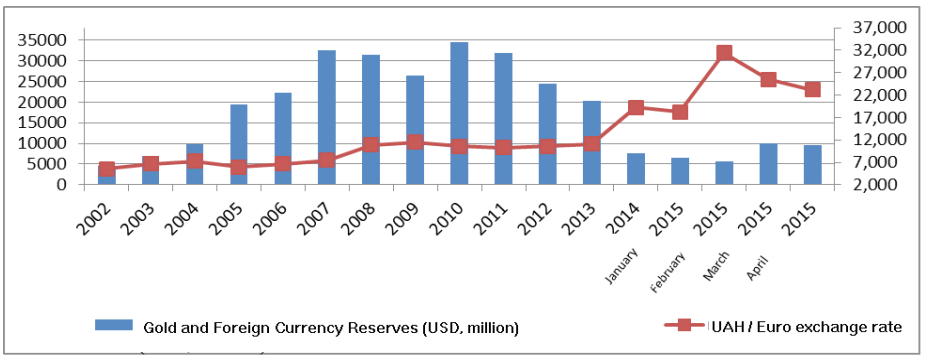

Fig. 2.4. Gold and Foreign Currency Reserves of the National Bank of Ukraine Dynamics and Official Exchange Rate of the Hryvnia against the Euro in 2002–2015 (developed by the authors according to [114; 144, p. 54; 145, p. 52; 147, p. 38])

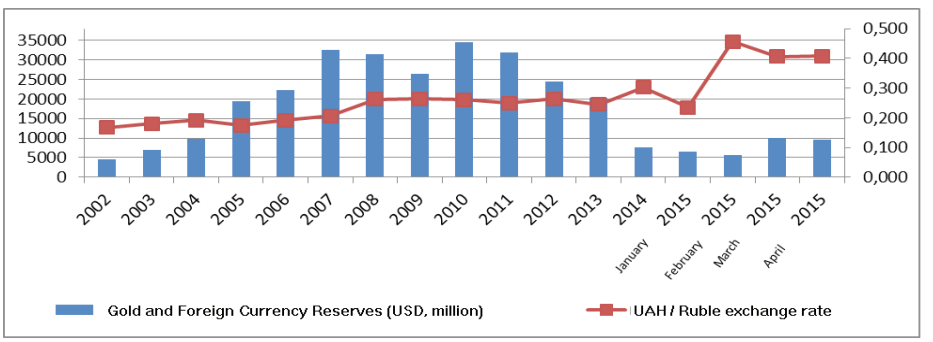

Fig. 2.5. Gold and Foreign Currency Reserves of the National Bank of Ukraine Dynamics and Official Exchange Rate of the Hryvnia against the Russian Ruble in 2002–2015 (developed by the authors according to [114; 144, p. 54; 145, p. 52; 147, p. 38])

A similar situation occurs with the Russian Ruble (Fig. 2.5). In the period from 2002-2006, the Hryvnia-Ruble exchange rate is stable; the rate increases from 2007 to 2008 due to the financial crisis. In the period from 2009 to 2013, the exchange rate is relatively stable due to exchange market interventions by the National Bank of Ukraine. Since 2014, with gold and foreign currency reserves level sharp decrease, that are not sufficient for exchange market interventions, the rate rises critically.

A substantial interrelation between the currency market of Ukraine and gold and foreign currency reserves can be considered as a circumstantial evidence of the fact that today the National Bank of Ukraine acts as the interbank market main subject by conducting large-scale interventions (Fig. 2.6).

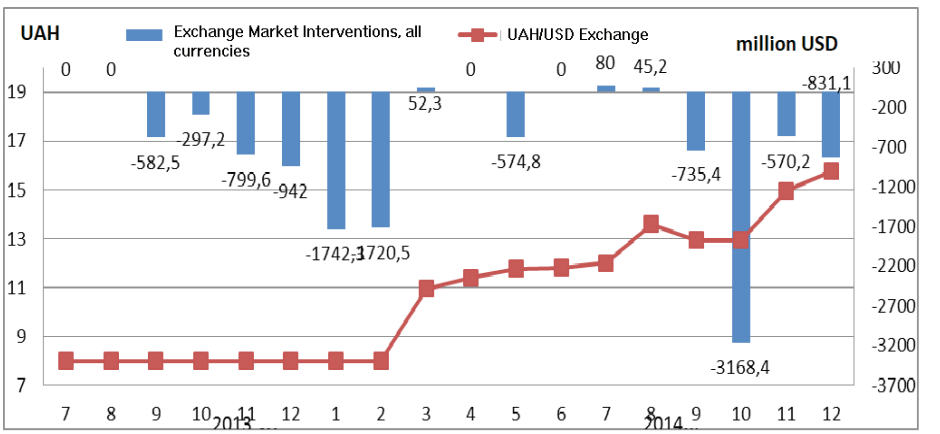

Fig. 2.6. Dynamics of Exchange Market Interventions of the NBU and the UAH/USD Exchange Rate in 2013–2014 (developed by the authors according to [62, 108])

The data in Fig. 2.6 indicate that due to foreign currency sale in 2013 and early 2014, the National Bank of Ukraine managed to maintain the exchange rate of the national currency against the US Dollar at the level of 7.99. From March 2014 due to the lack of active exchange market interventions a sharp increase up to 13.6 in the exchange rate of the Hryvnia against the US Dollar was observed. In September and October 2014 due to active exchange market interventions the NBU succeeded in decreasing the exchange rate to 12.9 UAH/USD. The data presented in Fig. 2.6 indicate a close interrelation between the exchange rate and exchange market interventions of the National Bank of Ukraine. One of the reasons for the national currency sharp fluctuations is gold and foreign currency reserves significant insufficiency to succeed in exchange

market interventions, and at the cost of which the national currency exchange rate stabilization is possible in Ukraine.

Exchange market interventions importance is confirmed by the fact that monetary policy in the post-socialist countries such as countries of Central and Eastern Europe, as well as Latin American countries, was built and implemented as a policy of the exchange rate stabilization, while the goals of the national economy macroeconomic stabilization were formed mainly on the exchange rates targeting basis [52, p. 47]. The exchange rate targeting objective is the national currency exchange rate level against a certain stable currency setting. To achieve a certain goal in terms of the exchange rate level, the Central Bank applies the policy of interventions (on the basis of FX reserves) on the currency exchange market [105].

The National Bank of Ukraine has begun active efforts to improve gold and foreign currency reserves management since 2002. Gold and foreign currency reserves structure was formed on the basis of foreign currency and monetary gold optimal ratio. Gold and foreign currency reserves management was carried out with the aim of obtaining high yields subject to minimum risks. In response to gold and foreign currency reserves portfolio rational diversification, the National Bank of Ukraine's currency assets were protected against depreciation caused by inflation processes, as well as their use for payments in various currencies settlement. Since June 2002, there has been a regular meetings of the Active Board on assets and liabilities of the National Bank of Ukraine management, whose mandate was to discuss and draft proposals of the NBU policy in the area of financial assets and liabilities of the NBU managing, formulation and implementation [89, p. 203-204]. Such actions resulted in foreign exchange reserves increase by USD 2,274 million in 2003 as compared to 2002 (Fig. 2.7), which in percentage terms amounted to 155.36 %. Fig. 2.7 presents gold and foreign currency reserves dynamics in 2002–2013

Fig. 2.7 demonstrates that gold and foreign currency reserves grew rapidly from 2002 to 2007. Totally they increased 7 times, or by USD 28,010 million. Given the current crisis in the global and national financial and economic system, they decreased by USD 5,974 million in the period from 2007 to 2009. During this period, gold and foreign currency reserves value increases due to the world monetary and financial system growing instability and global currency and financial crises, based on it, emergence. In 2009, due to interventions of the National Bank of Ukraine USD 7 billion dollars was purchased on the interbank currency market. As a result, an increase in foreign currency reserves amounted to USD 8,071 million in 2010 as compared to 2009.

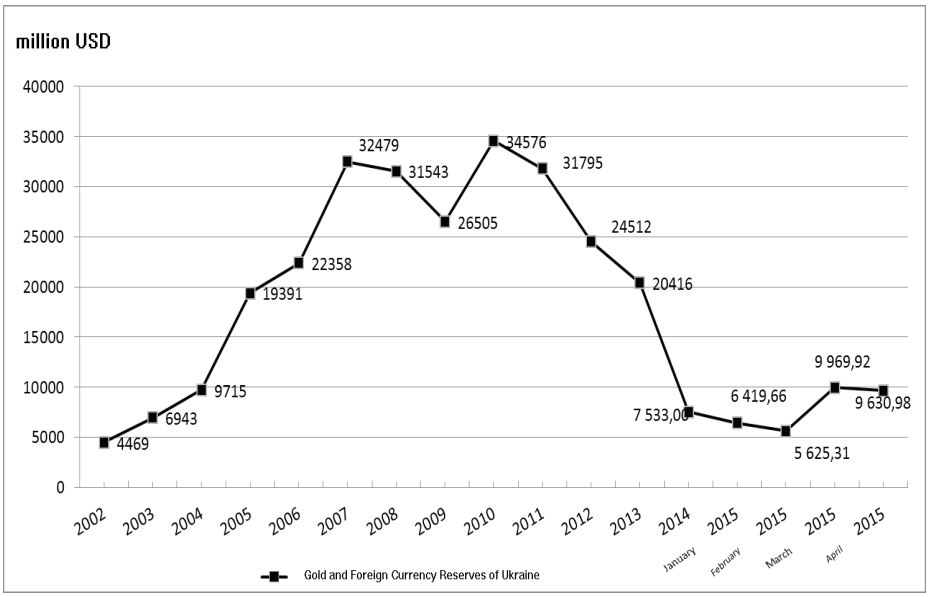

Fig. 2.7. Gold and Foreign Currency Reserves of Ukraine Dynamics in 2002 – 2015 (developed by the authors according to [114])

From 2010 a trend towards foreign exchange reserves decrease is observed. Thus, as on April 30, 2015 they decreased by USD 24,946 million as compared to 2010. In 2014 gold and foreign currency reserves decreased by USD 10,450 million as compared to 2013 due to gold and foreign currency reserves inefficient management, crisis phenomena and administrative restrictions introduction. A negative trend of gold and foreign currency reserves decrease is observed [114]. Such data indicate the need for the current system of FX reserves formation and management revision; new formation sources must be determined and the management system must be improved.

Gold and foreign currency reserves level optimization is of important economic value, since their understatement worsens the country solvency on the world market and limits the regulatory capacity of the State in monetary sphere, and the overstated level results in a significant share of the national wealth blocking for a long period. A wide range of factors determining the reserves formation necessity and affecting their amount, such as the country's position in global foreign trade turnover and domestic exchange rate policy, virtually eliminate universal rules for development their optimization suitable for any country and in any conditions [40, p. 59-60].

O. B. Lunin highlights two aspects of gold and foreign currency reserves management efficiency, namely: monetary and financial. The essence of monetary policy is gold and foreign currency reserves efficient management and ensuring their constant availability and applicability for the exchange market interventions or other measures. The financial aspect of management is gold and foreign currency reserves application efficiency, which is assessed by comparing actual and planned gold and foreign currency reserves earning yields. It is the second – financial – aspect of the reserves management efficiency is becoming relevant year by year. The reason for this is primarily in the Euro and the Dollar importance and position in the global monetary system change, the US government liabilities reliability reduction and gold cost increase. The fact that Central Banks have neglected financial aspect of gold and foreign currency reserves management efficiency for a long time, given that profit making is not the objective of the National Bank, should be noted. De-motivation in income, lack of adequate management methods and indicators for gold and foreign currency reserves management efficiency assessing have resulted in an uncertain strategy of the National Bank on financial markets [87, p. 7].

According to V. O. Gurova, to optimize the foreign exchange reserves structure the National Bank of Ukraine can diversify and hold it in several ways, namely:

– Cash on correspondent and current accounts in reliable foreign banks;
– Market liquid financial instruments;
– Requirements of the National Bank of Ukraine to non-residents in the form of short-term deposits [40, p. 60].

Ukraine holds a significant share of its reserve assets in securities, and, primarily, in non-residents' debentures [114]. This is due to the fact that period deposits in foreign banks reduce the reserves liquidity level and increase the risks. A characteristic feature of gold and foreign currency reserves structure formation is the desire to eliminate its cash share. This has an objective reason, since such assets provide the state with certain revenues. Their availability purpose is to provide current cash needs on the domestic market. It is this share of the reserves that is first applied to stabilize the currency market situation and the currency exchange rate.

In this regard, the analysis of the National Bank of Ukraine reserves structure, which affects reserve assets amount determination, is of particular relevance. Gold and foreign currency reserves of Ukraine consist of four assets groups:

– Reserves in foreign currency;

– Reserve position in the IMF;
– Special Drawing Rights;
– Other reserve assets [114].

Changes in gold and foreign currency reserves of Ukraine structure in 2004–2014 are presented in Table. 2.1.

Table 2.1 Gold and Foreign Currency Reserves of Ukraine Structure 31.12.2004 – 31.10.2014. (developed by the authors according to [114])

Period	Reserves in foreign currency,%	Reserve position in the IMF,%	SDR, %	Gold, %	Other reserve assets
2004	97.68	-	0.01	2.31	-
2005	97.92	0.00002	0.01	2.08	-
2006	97.70	0.00002	0.01	2.30	-
2007	97.86	0.00003	0.01	2.13	-
2008	97.62	0.00010	0.03	2.35	-
2009	96.18	0.00011	0.24	3.58	-
2010	96.36	0.00009	0.02	3.61	-
2011	95.59	0.00009	0.06	4.36	-
2012	92.26	0.00012	0.04	7.7	-
2013	91.08	0.00014	0.19	8.74	-
2014	91.98	0.00014	0.16	7.85	-

For the investigated period, the IMF's reserve share was the smallest, fluctuating within 0.00002–0.00014%, as well as Special Drawing Rights, which ranged 0.01–0.24%. For the analyzed period, other reserve assets included in gold and foreign currency reserves structure were not evidenced. These include derivative financial instruments and loans to non-bank non-resident institutions. The share of monetary gold increase is observed in 2003–2014, which increased from 2.08 to 7.85 %, i.e. more than four times. The largest and most significant share of Ukraine's gold and foreign currency reserves are foreign currency reserves – more than 90 % over the analyzed period. During the period a decrease in foreign currency reserves from 97.92 % as on 31.12.2005 to 91.98 % as of 31.10.2014 was observed. There is a need to examine foreign currency reserves structure presented in Table. 2.2 in more detail.

Table 2.2 Structure of Foreign Currency Reserves Included in Gold and Foreign Currency Reserves Structure, data as of 31.12.2004–31.10.2014. (developed by the authors according to [114])

Period / Reserves	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
1. Securities,%	7.73	20.78	39.04	48.17	53.51	54.63	57.10	61.45	71.41	83.88	60.79
2. Total foreign currency and deposits,%	92.27	79.22	60.96	51.83	46.49	45.37	42.90	38.55	28.59	16.12	39.21
a) in other Central Banks, the Bank for International Settlements and the IMF,%	53.66	34.97	8.47	0.11	16.80	17.36	8.44	8.67	28.28	14.39	8.07
b) in banks headquartered outside the reporting country,%	46.34	65.03	91.53	99.89	83.20	82.64	91.56	91.33	71.72	85.61	91.93
reserves in foreign currency,%	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Data of Table 2.2 indicate that the most significant trend that characterizes gold and foreign currency reserves diversification as an instrument of monetary policy application is a significant increase (from 7.73% as of 31.12.2004 to 83.88% as of 31.10.2013) in the share of securities denominated in foreign currency. On the other hand, a sharp decrease by 76.15 pp. (from 92.27% as of 31.12.2004 to 16.12% as of 31.10.2013) in the share of currency and deposits in foreign currency was observed in the investigated period. In 2014, due to a sharp decrease in gold and foreign currency reserves level, an increase in foreign currency and deposits with respect to securities held in FX reserves occurred. The bulk of foreign currency and deposits in foreign currency in banks headquartered outside the country was within the range of 46.34 to 99.89 % for the analyzed period (with the exception of 2004). Another share was cash and foreign currency deposits in other central banks, the Bank for International Settlements and the IMF.

These changes in the reserves structure are driven by the need for the state gold and foreign currency reserves effective management in conditions of crisis phenomena on the global financial markets aggravation. The financial crisis

significantly increased individual banks insolvency and bankruptcy probability (even with a fairly high rating; in which gold and foreign currency reserves could be held in custody) and caused major freely convertible currencies exchange rates volatility, in which gold and foreign currency reserves are held.

Thus, the main objective of the Central Bank of each country is an optimal structure of available gold and foreign currency reserves formation. Analysis of Ukraine's reserves modern structure makes it possible to conclude their insufficiency; at that, their diversification level is the main problem [155, p. 165–166]. Proper structure of gold and foreign currency reserves formation by the Central Bank enables it to properly execute its functions on foreign exchange relations regulation, primarily in terms of maintaining the national currency external stability and balance of payments equilibrium. In addition, foreign currency reserves are an important component of the issue-grade mechanism, and are one of the types of the national currency security in the Central Bank assets composition. Optimal structure of foreign currency reserves is also one of the factors that guarantee domestic monetary circulation stability in the country [55, p. 76].

To explore the available gold and foreign currency reserves of Ukraine in more detail, their dynamics should be considered: firstly, the reserves held in foreign currencies; secondly, the reserves held in gold. Such a need is determined by the fact that the main share was presented by these two gold and foreign currency reserves components for the analyzed period. Dynamics of reserves in foreign currency in 2004–2013 is presented in Appendix D.

As demonstrated by the data in Appendix D, reserves in foreign currency increased by USD 9,302.41 million for the analyzed period (from USD 9,489.51 million as of 31.12.2004 to USD 18,791.92 million as of 31.10.2013). The most significant increase over the analyzed period occurred in 2007, as compared to 2006, reserves in foreign currency increased by USD 9,940.01 million (145.51%). Over the past three years reserves in foreign currency decreased by USD 14,527.54 million (in 2011 it decreased by USD 2,928.06 million as compared to 2010 and in 2012 – by USD 3,123.08 million as compared to 2011). These data indicate a negative trend, which demonstrates that Ukraine pursues erroneous policy regarding reserves in foreign currency management. To increase this share of gold and foreign currency reserves the National Bank of Ukraine should conduct a number of measures aimed at FX reserves of Ukraine management system improvement.

For the Central Bank of the country gold reserves can act as the reserve of international means of payment for public authorities, private companies,

corporations and individuals. Traditionally, the National Banks reserves consist of physical gold and the most stable currencies. The National Bank regulates total precious metals reserves in absolute and relative terms, as well as determines their replenishment formation sources and means of these reserves realization and their profitability and liquidity ensuring. Determination of the necessary for the State share of precious metals in gold and foreign currency reserves composition is within the National Bank management competence [164, p. 425–426].

Monetary gold is included in gold and foreign currency reserves and is accounted for by weight in Troy ounces and valued at the US Dollar at the official exchange rate of the National Bank. The official exchange rate is calculated on the basis of information on gold prices, fixed (recorded) by the participants of the London Association of Precious Metals and the official exchange rate of the Hryvnia against the US Dollar. Gold, which is deposited in foreign banks, and on which interest is charged, is included in funds and deposits in foreign currency [115, p. 16]. Dynamics of gold reserves of Ukraine for the period from 2004 to 2014 is presented in Fig. 2.8.

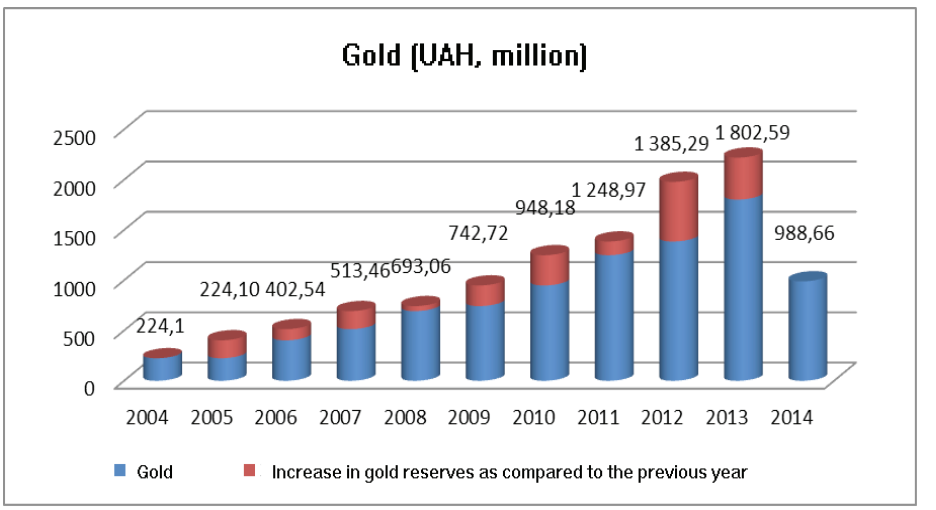

Fig. 2.8. Dynamics of Gold in Gold and Foreign Currency Reserves Composition in Ukraine, data as of 31.12.2004 – 31.10.2014 (developed by the authors according to [114])

According to Fig. 2.8, as of 31.10.2014, Ukraine has the amount of USD 988.66 million in its gold reserves. For the period from 2004 to 2013 with positive dynamics, gold reserves increased by USD 1,578.49 million. The most

significant decrease by USD 813.93 million occurred in 2014 as compared to 2013. This decrease occurred due to gold and foreign currency reserves inefficient management, crisis phenomena and administrative restrictions introduction.

The objective of the gold reserves share maintaining is not only monetary unit stability ensuring, but gold psychological importance as well, since gold is an aspect of trust for the population and other investors. An indirect interrelation of gold with money in circulation is based on confidence, which depends on gold and foreign currency reserves level. If gold was not assigned an important role, this could be perceived as the lack of confidence in this currency. Confidence in the National Bank is a decisive factor of its proper functioning. Thus, its gold and foreign currency reserves composition is essential to demonstrate that the Central Bank has not only a sufficient level to overcome possible crises, but a proper set of these resources as well [164, p. 427].

Fig. 2.9 demonstrates dynamics of gold reserves increase in tons in 2004–2014. As evidenced by the data in Fig. 2.9, as of 31.10.2014 the stock of gold in Ukraine amounted to 26.13 tons; for comparison: in 2013 the gold reserve amounted to 41.68 tons.

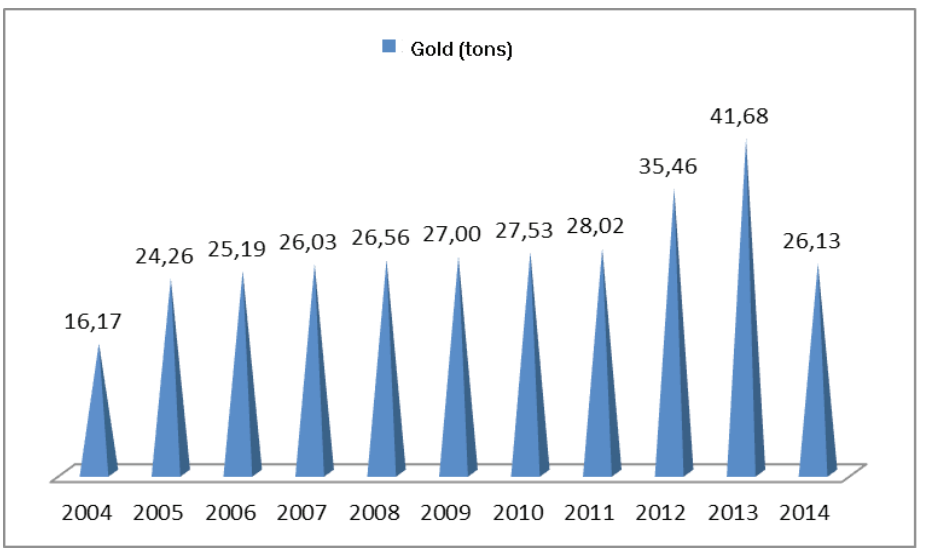

Fig. 2.9 Dynamics of Gold Reserves in Ukraine Increase in Tons, data as of 31.12.2004 – 31.10.2014, (developed by the authors according to [114])

A number of scholars believe that gold importance in the Central Banks' gold and foreign currency reserves structure indicates its low profitability compared to other assets. However, the trends of the gold coast rise indicate the opposite. The costs associated with gold custody, are advisable to be considered as the commission fees, paid for protection against unexpected inflation rates growth, debt crisis, the world monetary and trade agreements collapse. Gold has ceased to be a means of money protection, but no national currency (including the US Dollar) has received another, more reliable, more advanced protection system. The world monetary system is poorly protected without gold security. In the financial crisis conditions, gold functions as means of treasures accumulation, saving and formation become even more relevant and significant, i.e. gold acts as a reserve fund. It is concentrated not only in possession of private entities of money circulation (commercial banks, other financial institutions, companies and private individuals), but in the centralized state reserves as well.

Central Banks employ gold to stabilize and support the national currency both within the country and on international markets. According to Russian scientist-economist I. M. Shishkin, gold and foreign currency reserves is an important strategic financial reserve that can be compared with weapons that states prefer to preserve for security and employ only in exceptional situations, and the sale of gold can be compared with periodic disarmament to maintain global stability. Thus, the leading countries interest to gold is justified, since it is a symbol of monetary independence and stability of the states both at the national and international levels. In recent years the price of gold on the world market reached record levels, but despite this, many countries increase their reserves in gold [168, p. 67].

To confirm the appropriateness of gold and foreign currency reserves at the cost of gold formation, data of the analyst from the Russian Federation A. Sosnva on the amount of gold in the Central Banks of some world countries and its share in total gold and foreign currency reserves of these countries as of 2009 is presented in Table 2.3 [81, p. 19].

The data presented in Table 2.3 indicate that the developed countries hold a significant share of their FX reserves in gold. These are such countries as the USA, Germany, Italy, France. These countries possess more than 2,000 tons of gold (the USA – 8,133.5 tons), the share of gold in their reserves is more than 63%. The data suggest that the world's leading countries when forming their gold and foreign currency reserves prefer and pay much attention to gold as a monetary commodity.

Table 2.3 The Amount of Gold and its Share in Total Gold and Foreign Currency Reserves of Some World Countries as of December 2009 [81, p. 19]

Indicator Country	The amount of gold in FX reserves of the countries, t	The share of gold in total FX reserves of the country,%
1. USA	8,133.5	69.0
2. Germany	3,407.6	65.0
3. Italy	2,451.8	63.0
4. France	2,435.4	64.0
5. China	1,054.0	2.0
6. Switzerland	1,040.0	29.0
7. Japan	765.2	2.0
8. Netherlands	612.5	5.0
9. Russia	607.7	5.0
10. The European Central Bank	501.0	20.0

The main factors determining the necessity of state regulation of gold amount as an integral part of gold and foreign currency reserves are as follows:

– Gold is an important means of gold and foreign currency reserves of Central Banks diversification and, thus, makes it possible to eliminate risks when investing in different types of currency valuables;
– Gold is not impaired by any international loan commitments, which distinguishes it from other components of the reserves (investments in securities, cash and deposits in foreign currency), which express certain obligations of their issuers, i.e. foreign governments;
– Gold is an important insurance reserve, serving as a source of liquid resources in case of emergencies and unforeseen circumstances (natural disasters, catastrophes, wars, global financial crises etc.);
– Gold is a non-national asset which does not depend on the other countries monetary policy, as well as currency control and currency restrictions measures that may result in the country foreign currency assets blocking in other countries;
– Gold is an important element of ensuring the national currency in the Central Bank assets composition, given the volatile cost of assets in foreign currency due to the dynamics of domestic inflation processes in the currency issuing countries [173, p. 179].

In modern economic conditions gold as a financial asset interpretation is performed by the International Monetary Fund, which distinguishes a number of characteristics not inherent to the ordinary precious commodity. These characteristics include the following:

– Gold trading on financial markets is at the same level as foreign currency trading; in addition, gold is much easier to be purchased and sold than any other commodity, even as compared to other precious metals;
– Gold is a homogeneous metal which fineness can be easily tested. Any form of gold can be melted into standardized ingot bars for trading on the market;
– High liquidity of gold markets;
– Gold, like any other financial asset, is traded not only on the swap market, but through derivatives as well;
– This metal is used both for the purpose of short-term arbitration, and for the purpose of savings or as a long-term deposit;
– Exchange-traded funds (those where individual share is pegged to a specific amount of gold) is listed on the respective exchange market and regulated by financial authorities (UK Financial Services Authority);
– The gold loan and deposit market exists and interest rates are quoted;
– Governments increasingly recognize gold as financial assets;
– Well-researched and documented arguments describing importance of gold as a financial portfolio component are available [159, p. 236-237].

The following methods to invest in gold are applied in international practice:

1. Investment in physical gold. One of the methods to invest is to open a gold bank account. The second method is to purchase gold certificates, registered securities containing gold identification attributes and the owner's secret code. Another instrument for investment in gold, such as a plan of accounts accumulation, in which a certain amount is levied monthly from the investor's account for purchasing gold on a daily basis (regardless of the market situation) is available.
2. Investments in securities. Investing in gold through securities is aimed at purchase of derivatives (futures, options, warrants), shares of gold mining companies or investments in gold funds. Factors of investment in gold attractiveness are the following: firstly, gold possesses treasure value; secondly, it reduces the portfolio value (due to inflation risks in the gold price inclusion), and, thirdly, it is an alternative investment in the world market instability period [57, p. 99-100].

Given the foregoing, it can be argued that gold and foreign currency reserves are of significant importance in adopting monetary policy in Ukraine. A close interrelation between the reserves levels and the Hryvnia exchange rate dynamics is observed: during the periods of increase in gold and foreign currency reserves level a significant appreciation of the national currency occurs, and vice versa, during the periods of decrease in FX reserves the

Hryvnia depreciation is evidenced. With the assumption that gold and foreign currency reserves have decreased in recent years, it can be argued that gold and foreign currency reserves management requires improvement. Attention is also necessary to be drawn to gold and foreign currency reserves structure, namely to the reserve position in the IMF and Special Drawing Rights. It is the optimal structure of gold and foreign currency reserves formation, as well as set of measures for their effective management adoption that will enable the National Bank and the Government of Ukraine to perform functions and tasks regarding targeting and stabilization in the state currency system at the appropriate level.

2.2. Analysis of Gold and Foreign Currency Reserves of Ukraine Sources

An important issue in the national currency exchange rate regulation is sufficient gold and foreign currency reserves level for exchange market interventions, which creates opportunities for ensuring a certain stabilization of the national currency exchange rate. The process of FX reserves of Ukraine formation is important for achievement their sufficient level. It is on the reserves formation and management process depends their increase and other changes in the future. Analysis of FX reserves sources is an important element of the currency exchange rate regulation by the State.

Some aspects of providing countries with gold and foreign currency reserves, in particular, official reserve assets general dynamics, their geographical distribution, are considered both in the works of Ukrainian and foreign scientists, as well as in analytical materials of international organizations, especially the IMF. However, in modern scientific literature modern changes in foreign currency reserves distribution among countries with different types of economic systems, estimated currency structure of international reserve assets and identified causes of changes in gold and foreign currency reserves dynamics and structure have not been fully investigated [95, p. 387].

In accordance with the NBU Resolution "On the Official Currency Reserve and Currency Operations of the National Bank of Ukraine" and the Law of Ukraine "On the National Bank of Ukraine", Ukraine's gold and foreign currency reserves formation shall be carried out through:

– The National Bank of Ukraine internal funds (profit) in accordance with distribution approved by the Board;

– Monetary gold and foreign currency purchases;
– Currency funds from international financial institutions, Central Banks of foreign states and other creditors attraction by the NBU;
– Emission funds within the total emission level limits approved by the Verkhovna Rada of Ukraine upon the National Bank of Ukraine and the Cabinet of Ministers of Ukraine submission;
– Borrowings in accordance with agreements concluded by the National Bank of Ukraine and the Cabinet of Ministers of Ukraine with the International Monetary Fund and other international financial institutions [137; 138].

In modern foreign and domestic literature, a significant number of studies regarding gold and foreign currency reserves formation process in various countries, including Ukraine are available [10; 40; 53]. However, among these research materials no practical schemes for FX reserves formation is presented. Hence, the scientific-practical problem of structural-logical schemes for FX reserves formation development, as a scientific-methodical bases of these processes management in the national economy, arises. On the basis of analysis and theoretical studies, the following diagram of gold and foreign currency reserves of Ukraine formation has been developed and presented (Fig. 2.10).

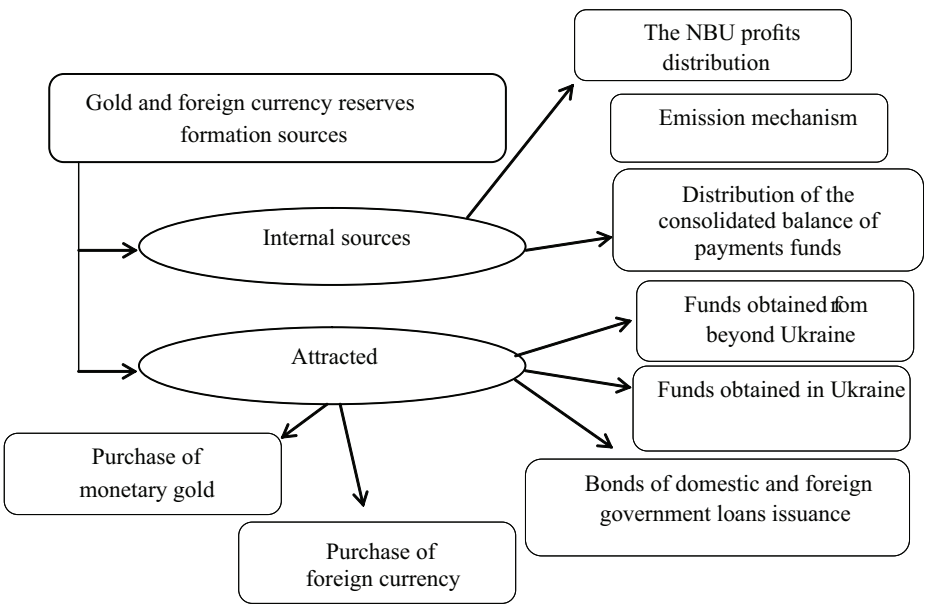

Fig. 2.10. FX Reserves of Ukraine Sources (author's development)

Consider the sequence of this structural-logical scheme components. The first is gold and foreign currency reserves replenishment through the NBU profit distribution. In accordance with the Law of Ukraine "On the National Bank of Ukraine" the National Bank shall distribute profit available for distribution after annual financial report confirmation by external audit and approval by the Board of the National Bank in the following ratio:

– 50% of the profit available for distribution is allocated to general reserves and other reserves of the National Bank. Allocation to the general reserves are carried out until the total reserves is equal to 10% of the National Bank total monetary liabilities;
– 50% of profit available for distribution is allocated to the state budget of Ukraine following the reporting year [137].

Consequently, the NBU can allocate no more than 50% of its profits to replenish gold and foreign currency reserves. The NBU profit is formed on the following principle: income minus expenses. It is advisable to consider data on the NBU income and expenses status (Table 2.4).

Table 2.4 Analysis of the National Bank of Ukraine Profits in 2011–2012 (developed by the authors according to [114])

Period	2011	2012	2013
Item	UAH, million	UAH, million	UAH, million
Total net income	**13,558**	**23,692**	**18,248**
Staff costs	-1,728	-1,948	-2,238
Expenses associated with production of banknotes, coins, souvenirs and other goods	-764	-810	-927
Administrative and other expenses	-629	-735	-847
Net increase (decrease) in reserves	-337	(725)	(537)
Total expenses	**-3,458**	**-2,768**	**-3,475**
Profit for the year	**10,100**	**20,924**	**14,773**

Data of Table 2.4 indicate that the NBU income exceeds expenses and according to the results of 2011, 2012 and 2013, profits were obtained in the amount of UAH 10,100 million, UAH 20,924 million and UAH 14,773 million respectively. It can be argued with little probability, as no data on the item "net profit increase and profit distribution for the year" allocation is available in official sources, that in 2011 FX reserves decreased due to net increase (decrease) in reserves by UAH 168.5 million; on the contrary, in 2012 and 2013, they increased by UAH 362.5 million and UAH 268.5 million

respectively (50% of the total amount was allocated). FX reserves increase at the cost of profits in 2011, 2012 and 2013 amounted probably to UAH 2,525 million, UAH 5,231 million and UAH 3,683 million respectively (25% of the profit for the year, after all, 50% is allocated to the Government and 50% – to general and other reserves increase).

According to the data presented above, the National Bank of Ukraine can increase gold and foreign currency reserves at the cost of income, but this amount is not significant, although interest-free. Consequently, due to the NBU profits distribution net gold and foreign currency reserves of Ukraine are formed. These funds can be increased in two ways: increasing revenues or cutting the NBU expenditures.

Since the National Bank of Ukraine cannot significantly affect its incomes, part of the revenues in Table 2.4 is grouped under an item titled "Other income of the NBU", which include:

– Results from operations with debt securities that are accounted for at fair value with revaluation result in financial results acceptance;
– Result from debt securities for sale disposals;
– Results from operations with financial instruments except for transactions in debt securities that are accounted for at fair value with revaluation result in financial results acceptance;
– Other profitable operations of the NBU [137].

The National Bank of Ukraine may affect FX reserves formation by cutting its expenses in part of:

– Staff costs;
– Expenses associated with production of banknotes, coins, souvenirs and other goods;
– Administrative and other expenses.

These expenses reduction will result in NBU's profit available to distribution increase; the increase of which will affect the share allocated to gold and foreign currency reserves of Ukraine formation.

Emission mechanism is the next source of gold and foreign currency reserves of Ukraine formation. The emission of currency is usually performed in cashless form by crediting the corresponding amount of funds to the correspondent accounts of banks in the National Bank of Ukraine. When the money is withdrawn from circulation, the corresponding amount, on the contrary, will be debited to these accounts [133].

The currency emission procedure is strictly regulated and is performed by the NBU through currency, equity and credit channels, and is ensured by receipt

of an equivalent amount of foreign currency or liquid financial instruments by the National Bank of Ukraine. Money can be withdrawn from circulation through these same channels when required. Through the foreign exchange channel money is issued or withdrawn by means of transactions with foreign currency purchase or sale on the interbank market by the National Bank of Ukraine. Through the stock channel money is issued or withdrawn by means of transactions with government securities purchase or sale on the open market by the National Bank of Ukraine. Through the loan channel money is issued by means of banks liquidity support through refinancing mechanisms by the National Bank of Ukraine. At that, money is issued on a repayable basis under appropriate collateral, which is provided by the National Bank of Ukraine in security for a certain period (from 1 to 365 days depending on the refinancing instrument), after which they are returned to the National Bank of Ukraine and withdrawn from circulation [4, p. 54].

The monetary base growth rate is subject to strict control. In particular, it is controlled in the International Monetary Fund obligations framework, which Ukraine assumed in the Stand-By Program implementation. In the Stand-By Program framework quantitative performance criteria are set for net domestic assets and net international reserves, which are the monetary base indicator components. The net domestic assets indicator demonstrates how the monetary base is formed by issuing funds in circulation through the channels other than foreign currency; in turn, the net international reserves ratio characterizes the monetary unit external resistance [114].

An increase in gold and foreign currency reserves through emission occurs through the exchange of the issued funds for foreign currency on international markets. In 2010 the net cashless emission amounted to UAH 35.5 billion. Almost all of these funds (99.4 %) was issued into circulation through foreign currency purchases for international reserves of Ukraine replenishment. Data as to the currency emission in Ukraine as of 2011 and 2012 are not available at the official NBU website and other official websites of Ukraine.

Another source of FX reserves formation is surplus of the consolidated balance of payments of Ukraine allocation. Gold and foreign currency reserves of the National Bank of Ukraine can also be reduced by financing the consolidated balance of payments deficit. Data on gold and foreign currency reserves increase and decrease due to surplus (deficit) of the consolidated balance of payments are presented in Table. 2.5.

Table 2.5 Gold and Foreign Currency Reserves Funding through the Consolidated Balance of Payments, 2008–2013 (developed by the authors according to [114; 128, p.13])

Indicator	Year					
	2008	2009	2010	2011	2012	2013
Consolidated balance of payments, USD, billion.	-3,063	-13,726	5,031	-2,455	-4,175	2,023
Funding through FX reserves, USD, billion	1,080	-5,654	8,460	-2,455	-7,594	-3,552

Gold and foreign currency reserves increase in 2008 against the annual deficit background was due to the surplus in the II and III quarters of 2008, the annual deficit was caused by the consolidated balance of payments deficit in the III and IV quarters of 2008 [125, p. 10].

Another source of gold and foreign currency reserves of Ukraine formation is monetary gold purchase by the National Bank of Ukraine. This mechanism occurs through the monetary gold purchase by the National Bank of Ukraine:

– From the population of the country;
– On the international foreign exchange markets;
– On the international forex exchange;
– From the governments of other states [114].

Active actions of the National Bank of Ukraine to increase monetary gold reserves share in gold and foreign currency reserves composition result in the reserves annual increase. In early 2012, billboards appeared in big cities of Ukraine, in which the NBU encouraged Ukrainians to replenish gold and foreign currency reserves of Ukraine through their gold sale [142]. Data on monetary gold reserves share increase in FX reserves composition are presented in Table. 2.6.

Table 2.6 Share of Monetary Gold in FX Reserves Increase in 2009–2013 (developed by the authors according to [114])

Indicator	As of:				
	31.12.2009	31.12.2010	31.12.2011	31.12.2012	31.12.2013
Gold share increase for the year (in tons)	0.435	0.529	0.498	7.441	6.222

The data presented in Table. 2.6, indicate gold and foreign currency reserves formation mechanism through monetary gold purchase by the NBU efficiency. For the analyzed period from 2009 to 2013 increase in monetary gold by 15 tons in FX reserves structure is observed (Fig. 2.9). The most significant

increase occurred in 2012 and at the end of the year amounted to 7,434 tons of monetary gold, which equals USD 505.07 million. Though FX reserves formation through monetary gold purchase is not essential in the national FX reserves overall structure, gold is a kind of protection (structural guarantor) from sharp FX reserves decrease due to negative financial and monetary events. As practice demonstrates, monetary gold price increases every year, and the National Bank does not spend large amounts of money on gold reserves maintenance.

One of gold and foreign currency reserves formation methods is attracting funds from economic entities in Ukraine and abroad. Funds attraction is expressed as cash loans, which are credited to FX reserves in US Dollars. Information on funds attraction is not available on the official websites in Ukraine. It can be concluded that the National Bank of Ukraine does not apply funds attraction in Ukraine as gold and foreign currency reserves formation source. Such actions can be explained by high interest rates in Ukraine as compared to other countries. But we must not forget that the NBU can obtain loans on preferential terms within the country.

A powerful method of gold and foreign currency reserves formation is funds attraction outside Ukraine. Some of the international financial institution from which Ukraine has obtained or may obtain loan funds include:

– The International Monetary Fund;
– The World Bank;
– The European Bank for Reconstruction and Development;
– Foreign Governments [114].

The practice of attracting funds from international institutions for gold and foreign currency reserves formation demonstrates that among international institutions the International Monetary Fund (IMF) is the main formation source. External borrowings chronology is presented below.

In 2006 international reserves level increased by USD 2.9 billion, the main source of the growth was the Government external borrowings – USD 2.3 billion [147, p. 62]. Ukraine reached an agreement with the International Monetary Fund mission on granting a stabilization Stand-by loan of USD16.5 billion to overcome the financial and economic crisis consequences. The loan was granted under the floating interest rate, which amounted to about 4% per annum, with quarterly interest repayments. One of the areas of the IMF loan application is foreign exchange reserves formation. These reserves with the IMF loan formation allowed Ukraine to maintain the national currency stability, successfully implement monetary reform, and introduce the Hryvnia

current accounts convertibility. In addition, foreign exchange reserves increase and their high level is a proof of the financial system stability and increases its credibility level [3, p. 152-154].

One of the sources of international reserves replenishment in 2008 was funds from the International Monetary Fund in the amount equivalent to SDR 3 billion or USD 4.6 billion receipt in November [144, p. 59]. The main source of international reserves replenishment in 2009 was the receipt of funds from the International Monetary Fund (through two tranches and SDRs reallocation) in the amount equivalent to SDR 5.3 billion or USD 8.3 billion over the year [145, p. 58]. Basic formation of gold and foreign currency reserves in 2008–2009 was primarily due to the receipt of regular tranches of the IMF stabilization loan under the Stand-by agreement, signed in November 2008. This loan is granted in Dollar equivalent. Although the funds obtained do not remain in the reserves structure for long, they cause slight "jumps" in the reserves level at the time of the IMF next tranche receipt (Fig. 2.11) [16].

The data in Fig. 2.11 indicate that obtaining the IMF loan was necessary to stabilize gold and foreign currency reserves of Ukraine, since their level declined sharply by October 2008 and amounted to USD 31,924.07 million. After obtaining the first IMF tranche in November 2008 they increased to USD 32,743.89 million. The data in Fig. 2.11 indicate that after obtaining the IMF first, second and third tranches FX reserves increased in the receipt periods, while the reserves were on decline in the following months.

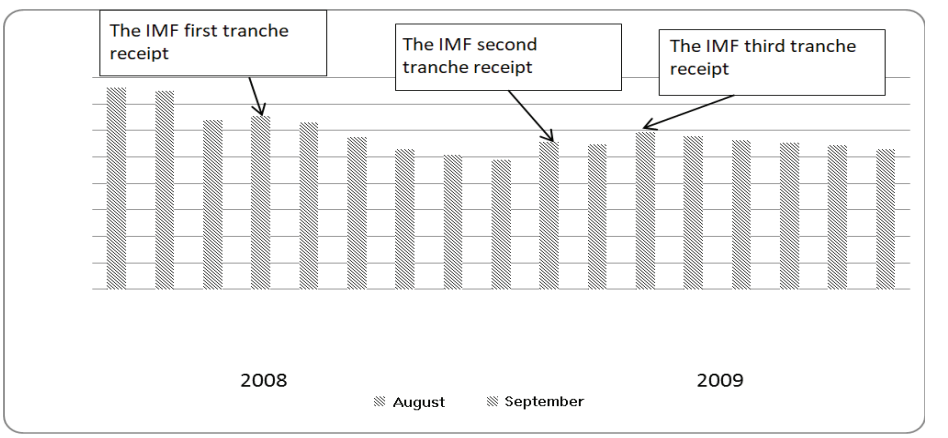

Fig. 2.11 Data on the IMF Loan Impact on Gold and Foreign Currency Reserves of Ukraine [16]

In 2010 gold and foreign currency reserves increase occurred due to the loans amounted to USD 2 billion receipt from VTB Bank (Russia) in June. One of the sources of international reserves replenishment was next tranches equivalent to USD 3.4 billion from the International Monetary Fund receipt in August and December [125, p. 20].

The International Monetary Fund loan is quite cheap for the Government since it provides for interest payments at the rate of about 2% per annum from the total indebtedness. At that, the loan repayment took place at the period from 2012 to 2014, and the interest repayment took place from 2009 to 2014 [94]. The IMF loan repayment was carried out at the cost of the Governmental funds as well as by deductions from gold and foreign currency reserves of Ukraine. The IMF loan repayment schedule is presented in Fig. 2.12.

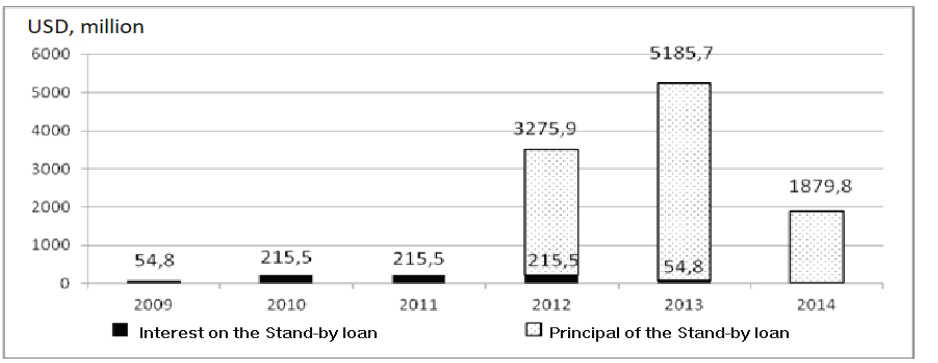

Fig. 2.12. Schedule of The IMF Stand-by Loan Repayment [94]

Ukraine has already obtained three tranches of the International Monetary Fund loan. Certain problems have arisen with the receipt of the fourth tranche of the loan, which Ukraine has so far been rejected due to inconsistent Government policy, which is a negative trend, as it can significantly affect the reputation of Ukraine on the international arena. It is therefore evident that Ukraine further cooperation with the International Monetary Fund should be based on comprehensive consideration of both its positive and negative aspects [3, p. 154-156]. The main source of gold and foreign currency reserves replenishing in 2014 was the Government foreign and domestic borrowings, which eventually amounted to USD 8.9 billion [109, p. 17-18].

The next source for gold and foreign currency reserves formation is securities issuance, namely, bonds of domestic and external government loans issuance. Bonds of domestic government loans of Ukraine (Domestic Bonds)

are government securities placed exclusively on the domestic stock market and confirming the obligation of Ukraine to reimburse these bonds bearers their face value with income payment in accordance with the bond placement terms. The bonds of domestic government loans of Ukraine nominal value may be defined in foreign currency. Bonds of external government loans (External Bonds) are government debt securities placed on international and foreign stock markets and confirming the obligation of Ukraine to reimburse these bonds bearers their face value with income payment in accordance with the bonds issuance terms. Bonds of external government loans of Ukraine can be denominated in convertible foreign currency. Bonds of external government loans of Ukraine are issued as interest, discount and can be registered or payable to bearer, with free or limited circulation. The current legislation provides that bonds of external government loans of Ukraine shall be payable exclusively in convertible foreign currency in accordance with the bonds issuance terms [104, pp. 337-344].

The data presented in Table 2.7 demonstrate the fact that gold and foreign currency reserves of Ukraine replenishment level through Domestic and External Bonds is significant.

Table 2.7 Volumes of Domestic and External Bonds Issuance during 2008–2014 (developed by the authors according to [108, p. 48–50; 114])

Name	Year						
	2008	2009	2010	2011	2012	2013	2014
Domestic Bonds, UAH, billion.	49.6	103.8	79.1	55.2	42.9	65.2	11.7
External Bonds, USD, billion.	–	–	–	0.4	2.5	5.3	0.2
Domestic Bonds, Euro, billion.	–	–	–	–	0.3	0.11	–
External Bonds, UAH, billion	–	–	2	2.75	4.85	–	1

Data of Table 2.7 indicate that for the analyzed period funds attraction through Domestic Bonds issuance prevails in Ukraine. The disadvantage of funds attracted by the state from Domestic and External Bonds issuance is primarily their short and medium term. In particular, if External Bonds circulation period is 5-10 years, the circulation term of almost 90% of all issued Domestic Bonds does not exceed three years. Short-term domestic borrowing negatively affects long-term investment projects implementation and the Government debt further refinancing possibility in the worsening domestic economic situation. With such a situation continuation a very negative background for the national debt effective management in the future is created. Another disadvantage of

Domestic Bonds as compared to External Bonds issuance is that the external borrowings cost is lower for the country than the domestic ones, which yields are still at a rather high level, which is burdensome for the State budget. It is confirmed by the data presented in Table 2.8.

Table 2.8 Comparative Data of Domestic and External Bonds Yield Rates (developed by the authors according to [108; 114])

Year	Issued External Bonds yield rate, USD,%	Domestic Bonds average weighted yield rate, USD,%
2008	–	–
2009	–	–
2010	6.875; 7.75	–
2011	6.25; 7.95	8.78; 9.00; 9.30
2012	7.8; 7.95; 9.25	9.3; 9.45; 9.55
2013	–	8.02; 8.25; 8.50

Domestic and External Bonds issuance by the Government of Ukraine was stipulated not only by the need for foreign currency to maintain the national currency exchange rate stability by increasing the country's gold and foreign currency reserves, but by the following factors as well:

– External Bonds lower yield as compared with the cost of resources in the domestic capital market and ability to attract resources for a longer period;
– Limited domestic capital market;
– The need to cover negative balance of payments;
– Previously issued debentures servicing and repayment;
– Velocity of attracting the necessary resources and others [102].

O. Dubihvist, the Director of the Department of Foreign Exchange Reserve Management and Open Market Operations of the National Bank of Ukraine, explained that the increase in reserves is mainly due to the revenue accounts of Government funds from placement domestic government bonds denominated in foreign currency [114]. However, Domestic and External Bonds issuance does not significantly affect Ukraine's gold and foreign currency reserves formation, since in addition to FX reserves through the securities issuance formation, the funds obtained from this operation also have other sources of application. Information on these funds share allocated for gold and foreign currency reserves of Ukraine formation is not available.

Reserve currency selection is an important issue affecting gold and foreign currency reserves formation and custody. Information on the currency in which gold and foreign currency reserves are held in custody is not available on the

official website of the NBU and on other official websites of Ukraine. An opinion was expressed by F. O. Zhuravka, who in his article made an assumption concerning currencies composition in FX reserves of Ukraine structure [55, p. 76]. According to his data, as on FX reserves currency structure, it has the following composition:

– US Dollar – about 60% (since 75-80% of all foreign economic transactions in Ukraine is carried out in US Dollars);
– Euro – about 30%;
– Other currencies (British Pound, Swiss Franc and gold) – about 10% [55, p. 76].

According to the Doctor of Economics O. Dzyublyuk, only the Euro can now be the main serious competitor as a reserve currency to the US Dollar. He attributes this to the fact that the share of Japanese Yen in international trade does not exceed several percent, while the share of other reserve currencies (British Pound, Swiss Franc) is even lower. Thus, "the US dollar is not primarily competing a Yen or a Pound Sterling, but the Euro. However, its significant revaluation against the Dollar is disadvantageous to European exporters, which to some extent is a deterrent to the use of the Euro as the main world reserve currency" [43, p. 270].

Among gold and foreign currency reserves formation sources none has a decisive influence on their increase. Internal sources of FX reserves formation are the National Bank of Ukraine profits distribution, consolidated balance of payments funds allocation and money issuance. Profit distribution as well as money issuance profitability is explained by the fact that these funds do not need to be repaid in the future. Although funds borrowing has a significant impact on gold and foreign currency reserves of Ukraine level, it should not be forgotten that these funds will be required to be repaid and payed interest in the future, which will result in gold and foreign currency reserves decrease. In the process of obtaining loans and issuing bonds of domestic and external government loans, the funds from these transactions are not credited to FX reserves in full, but only partially. The main share of the reserve currency, according to the leading scientists, is the US Dollar. Consequently, achievement a significant increase in FX reserves at the cost of their formation sources is impossible. Gold and foreign currency reserves should be increased through their effective management.

2.3. Analysis of Gold and Foreign Currency Reserves of Ukraine Management Tools as a Factor of the National Currency Exchange Rate Regulation

One of the main disadvantages of the NBU gold and foreign currency reserves management policy is the lack of transparency (transparent information for the society). Experts are of the opinion that the information regarding Ukrainian currency reserves formation, placement terms, composition, actual application and terms for returning to the country is completely confidential even for the state highest authorities – the Parliament, the Government and, above all, is not available for the defined by the Constitution of Ukraine Supervisory Body – the NBU Council. Indicative for this reason is the opinion of the ex-chairman of the NBU Council, Academician of the National Academy of Sciences of Ukraine V. Geits, that "... no one will document us today whether the money (foreign currency reserves) is really available and how the NBU can take advantage of these reserves. The NBU Council has no authority to obtain primary documents and to verify the actual situation... " [34, p. 9].

Concerns as to this situation are expressed by law experts as well. Thus, Major-General of the Security Service of Ukraine, Candidate of Legal Sciences, Honored Lawyer of Ukraine A. Matios and the Professor of Kyiv University of Market Relations, Doctor of Law A. Kovalchuk, express the opinion that "uncontrolled placement of foreign exchange reserves and obviously inept legal support for this extremely important process have resulted in the fact that, with the first manifestations of global financial crisis at least one third of the currency reserves (as reported by some media), it is in the part of their early repayment, were not available for the Ukrainian State" [65, p. 14].

Gold and foreign currency reserves management has a significant impact on the exchange rate formation. The national currency exchange rate stabilization depends on their application effectiveness. FX reserves management can be divided into two parts: FX reserves application and FX reserves placement. Each of them has its subparagraphs determined by the Legislation of Ukraine. In accordance with the NBU Resolution "On the Official Currency Reserve and Currency Operations of the National Bank of Ukraine" and the Law of Ukraine "On the National Bank of Ukraine", Ukraine's gold and foreign currency reserves application shall be carried out for the following purposes:

– Stabilization of the exchange rate through exchange market interventions [138];

– Currencies on financial markets sale for monetary policy, including exchange rate policy, implementation;
– Expenses on operations with foreign currency, monetary metals, as well as other internationally recognized reserve assets and operations to support the National Bank activities;
– Participation in capital formation and activities of international institutions;
– Currency funds return to international financial institutions, foreign Central Banks and other creditors, including interest on such funds and other mandatory charges by the National Bank [137].

The National Bank of Ukraine devotes much attention to gold and foreign currency reserves management. FX reserves were held on accounts of correspondent banks as well as in financial instruments with long-term credit rating of not lower than "A" level. Credit exposure control was ensured by establishing lending ceilings for the counterparty banks. Optimal level of currency and interest risks was ensured through international reserves diversification [147, p. 57]. Each year the NBU Management defines the main management objective and management program for gold and foreign currency reserves management. FX reserves management objective is ensuring an optimal balance levels of security, liquidity and yield that provided the functions of the National Bank of Ukraine, as defined by the current Legislation of Ukraine [144, p.57]. At the same time, the reserves maximum security level, liquidity and yield ensuring cannot be achieved. As a consequence, the National Bank faces the issue of goals in gold and foreign currency reserves management selection, which are to provide:
– The reserves security degree that meets the NBU requirements;
– The reserves liquidity degree that meets the NBU requirements;
– The expected reserves yield level.

The FX reserves Management Program is the "Investment Declaration of Gold and Foreign Currency Reserves of the National Bank of Ukraine", designed to active investment policy implementation that is aimed at obtaining additional income [145, p. 56]. In international reserves management process, the National Bank of Ukraine applies the following main financial instruments:
– Government securities of the industrialized countries;
– Deposit accounts in foreign banks [146, p.54].

One of the management goals is ensuring a high level of gold and foreign currency reserves protection, which, in turn, is determined by:

– Credit exposure, i.e. the risk of losses caused by the credit quality of gold and foreign currency reserve investment object deterioration or impossibility to perform obligations by the National Bank's counterparty;
– Market (currency and interest) risk, i.e. the risk of losses caused by changes in financial markets and in accordance with foreign exchange rates and interest rates fluctuations;
– Operational risk, i.e. the risk of losses caused by violations in the technical and computer means, erroneous or intentional actions (inaction) of staff, force majeure, etc.;
– Legal risk, i.e. the risk of losses caused by partial or complete loss of the reserve ownership use, or disposal rights as the result of particular legal issues [119].

The International Monetary Fund noted that the rigorous monetary policy of the National Bank of Ukraine is aimed at addressing primarily external risks and inflation control problems. However, coupled with borrowed funds share reduction, this tightens credits growth. Increasing liquidity, as well as prudential standards and administrative measures, contributes to the exchange rate stability [120].

To ensure control over credit exposure, which the National Bank incurs in gold and foreign currency reserves management, the following restrictions and requirements are established:
– Investment grade of the National Bank counterparties and debtors for transactions with gold and foreign currency reserves, as a rule, must be not below the AA level – according to rating agencies Fitch and Standard&Poor's classification (according to Moody's classification);
– The minimum acceptable investment grade of the National Bank counterparties and debtors for transactions with gold and foreign currency reserves is set at A level according to rating agencies Fitch and Standard&Poor's classification (or A2 according to Moody's classification), except for transactions that are fully secured by collateral, or delivery versus payment terms. Contracts implementation with counterparties or debtors in the investment grade below this level for transactions with gold and foreign currency reserves is prohibited;
– For credit exposure quantitative limitation credit limits on types of transactions for each counterparty and debtor as well as credit limits for countries are set;
– Credit limits are not set for reserve currencies Central banks-issuers;
– Credit limits are not set for reserve currencies countries-issuers [119].

Foreign exchange risk control is carried out taking into account all balance and off-balance sheet assets and liabilities of the National Bank in foreign currency and monetary gold, namely:

– Through gold and foreign currency reserves foreign exchange diversification – various reserve currencies and monetary gold inclusion in gold and foreign currency reserves in accordance with gold and foreign currency reserves normative currency structure;
– Through establishing the maximum deviation of gold and foreign currency reserves actual currency structure from the normative one;
– Through gold and foreign currency reserves actual currency structure daily calculation and control over its deviation from the normative currency structure [119].

Interest risk control is performed by:

– Investment horizon and the maximum duration of gold and foreign currency reserves regulatory investment structure establishment so that at least a 95 percent probability to avoid losses due to interest rates changes on financial markets;
– Deviations of actual gold and foreign currency reserves duration from the normative one daily monitoring [119].

Liquidity is one of the most important gold and foreign currency reserves characteristics. In the management process high liquidity is provided by the following actions:

– Choice of reserve currencies and acceptable for the National Bank financial instruments that form gold and foreign currency reserves regulatory foreign exchange and investment structure;
– Limitation of the planned gold and foreign currency reserves investment period (investment horizon) and the average weighted period of gold and foreign currency reserves invested funds return (duration);
– Monitoring reserve currencies and financial instruments liquidity parameters and those reserve currencies or financial instruments the liquidity of which is deteriorating prompt removal from the normative currency or investment structure;
– Monitoring financial markets and counterparties [119].

Gold and foreign currency reserves management is a complex and multifaceted mechanism. Gold and foreign currency reserves of the National Bank of Ukraine management scheme is presented in Fig. 2.13.

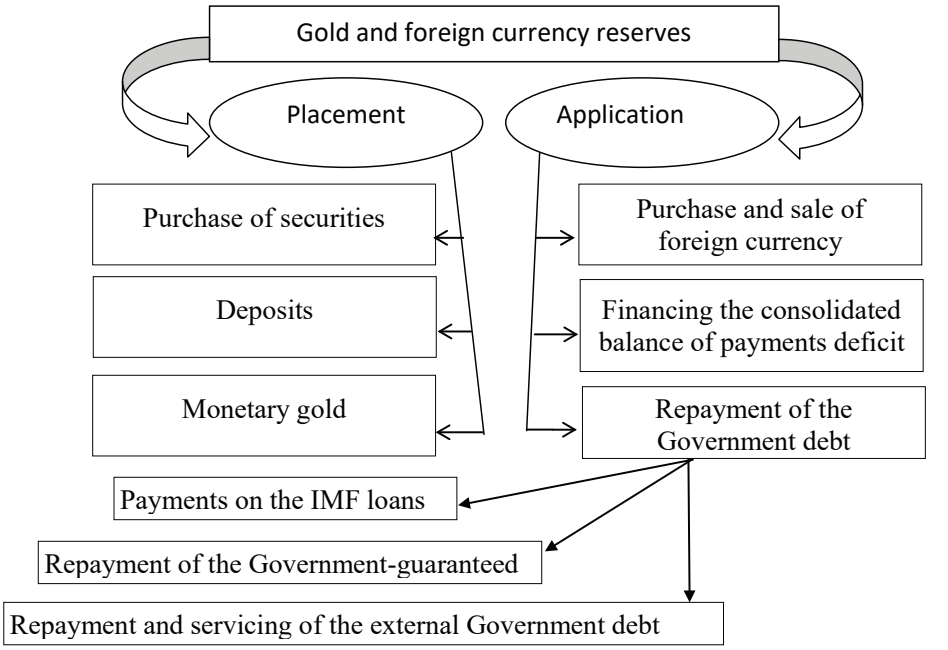

Fig. 2.13. Gold and Foreign Currency Reserves of the National Bank of Ukraine Management (author's development)

The most actual area of gold and foreign currency reserves placement is funds investment. Practice indicates that gold and foreign currency reserves funds are placed in foreign banks by the NBU. Information on the exact funds placement and deposits amount, as well as income from them is not available on the website of the National Bank and other official websites of Ukraine. According to the NBU official reports, funds are not placed on the territory of Ukraine, they are in banks in the USA, Switzerland and the United Kingdom [145, p. 56]. These funds were invested as short term deposits. A. Matios and A. Kovalchuk expressed their assumptions that a significant amount of Ukrainian gold and foreign currency reserves were placed on the accounts of the bankrupt Lehman Brothers Bank and the accounts of the American banking retailer Wachovia (a company selling banking services on consumer market for small and home offices), which was soon merged by a stronger competitor, Wells Fargo [65, p. 14]. V. Geetz argues that most of the reserve cash is stored at the Federal Reserve Bank of New York and the French bank BNP Paribas [40, c. 61].

Another source of FX reserves placement is purchase of foreign countries' securities by the NBU. Practice demonstrates that among the securities held

in gold and foreign currency reserves, Treasury bills and government bonds of foreign countries primarily predominate as the most reliable types of stock instruments. The National Bank of Ukraine pays great attention to gold and foreign currency reserves placement in securities, as compared to deposits their share in gold and foreign currency reserves composition increases with each passing year.

The issue of securities custody in gold and foreign currency reserves composition is complicated and not disclosed on the website of the NBU and other official websites of Ukraine. Clear information on the securities composition and their yield is not available. Thus, for example, V. Okhrimenko, the President of the Ukrainian Analytical Center in his blog argues that gold and foreign currency reserves of the National Bank were decreased due to reduction in securities price stored in them. He notes that, as a rule, gold and foreign currency reserves will include securities in the form of government bonds of other countries; shares are not purchased in gold and foreign currency reserves composition. Then it is not clear why they went down in value. Assuming that US government bonds, which in 2011 became more profitable, are in gold and foreign currency reserves composition, it can be argued that their prices on the secondary market declined. As a result, the valuation of investments in securities declined. The expert also notes that financial institutions and banks consider the value of bonds not at the secondary market price, but at accumulated income or in the form of a discount or a coupon. With increase in the US government bonds yield, the securities value in our gold and foreign currency reserves composition should grow, not decline. These government bonds might have been denominated in the Euros, then the cost reduction can be understood, since gold and foreign currency reserves accounting is performed in the US Dollars [170].

Dilara Mustafayeva, an expert of the Independent Association of Ukrainian Banks, claims that the bulk of the securities in Ukraine's gold and foreign currency reserves composition is formed by sovereign bonds denominated in the US Dollars and Euros. She notes that there are certain rules for gold and foreign currency reserves formation, and their observance is a special department within the NBU responsibility. Issuer's reserves structure is not disclosed by the regulator. Once a year, in the annual report, the National Bank of Ukraine provides aggregated information on gold and foreign currency reserves and investments structure. More detailed information can only be provided by the NBU [97].

The next FX reserves placement instrument is monetary gold. Placement of monetary gold that is part of gold and foreign currency reserves is in custody in the State Treasury's vault. A share of monetary gold is placed in long-term deposits. Information on the amount and placement is not available in the official reports of the National Bank and on the official websites of Ukraine [114].

Gold and foreign currency reserves of Ukraine are expanding through their management, namely placement tools application. The National Bank in its reporting does not provide any additional information on FX reserves increase through the impact of each of the tools used in gold and foreign currency reserves management. In the annual report, the NBU discloses only the information on total income, as well as gold and foreign currency reserves management economic viability. Based on these data, yield and revenue from each FX reserves placement instrument determination is impossible. Data on income and gold and foreign currency reserves of Ukraine yield in 2008–2013 are presented in Table. 2.9.

Table 2.9 Earning Yield of Gold and Foreign Currency Reserves of Ukraine Management in 2008–2013 (developed by the authors according to [144, p. 57; 145, p. 56; 146, p. 54; 147, p. 57; 149, p. 55]

Indicator	Year					
	2008	2009	2010	2011	2012	2013
Income, USD, million	1.9	545.16	433.3	591.3	357.7	49.1
Annual yield,%	5.4	1.9	1.4	1.7	1.39	0.27
Note on FX reserves composition (USD, million)						
Securities	16,475.49	13,926.85	19,026.99	18,675.00	16,172.2	12,568.36
Foreign currency and deposits	14,316.36	11,566.48	14,292.45	11,716.38	6,474.42	6,191.16
Total FX reserves	31,543.20	26,505.11	34,576.40	31,794.61	24,546.19	20,416.12

The data presented indicate that the yield from gold and foreign currency reserves placement does not significantly affect their increase. A negative factor is decrease in annual FX reserves yield from 5.4% in 2008 to 0.27% in 2013. Conclusions on the National Bank of Ukraine ineffective policy regarding FX reserves placement can be drawn. A constraining factor for FX reserves due to their placement increase is a low yield rate. The fact of a meager income of USD 1.9 million with a yield of 5.4% received in 2008 remains obscure.

One of the sources of gold and foreign currency reserves growth and one of the main instruments of the exchange rate regulation in Ukraine is interbank foreign exchange market intervention by the National Bank of Ukraine. FX

reserves growth and the national currency exchange rate regulation is due to the foreign currency purchase and sale on the interbank markets and exchanges. Data on foreign currency purchase and sale status in 2008–2013 are presented in Table 2.10.

Table 2.10 The NBU Exchange Market Interventions in 2008–2013 (developed by the authors according to [114])

Year	Purchased, USD, billion	Sold, USD, billion	Balance, USD, billion
2008	7	1.4	5.6
2009	0	10.4	-10.4
2010	8.7	7.4	1.3
2011	9.9	13.7	-3.8
2012	3.7	11.9	-8.2
2013	1.1	4.3	-3.2

According to Table 2.10 it can be concluded that gold and foreign currency reserves due to the NBU exchange market interventions in 2009, 2011, 2012, and 2013 decreased by USD10.4, 3.8, 8.2 and 3.2 billion respectively. In 2009 and 2010 due to successful exchange market interventions on the interbank markets an increase of USD 5.6 and 1.3 billion respectively in FX reserves was observed. Thus, exchange market interventions have a significant impact on gold and foreign currency reserves of Ukraine level increase or decrease.

Exchange market interventions importance is reflected in the main principles of monetary policy for the next year development. Thus, the main principles of monetary policy for 2014 assumed that the NBU will remain on the interbank foreign exchange market, in particular through exchange market interventions, which will be structured by the need to achieve inflation targets, which are subject to all other monetary policy objectives. The efforts of the National Bank were also aimed at preserving international reserves stabilization capacity both in terms of the Hryvnia exchange rate flexibility increase, and currency risks specific coverage [149, p. 9-10].

The next source of gold and foreign currency reserves application, which affects their decrease, is the consolidated balance of payments deficit financing. Such financing occurred in 2009 and 2011:

1) Negative consolidated balance of payments amounted to USD 13.7 billion in 2009; reserve assets in the amount of USD 5.7 billion were used for consolidated deficiency payments [127, p. 9];

2) Negative consolidated balance of payments amounted to USD 2.5 billion in 2011; reserve assets in the amount of USD 2.5 billion were used for consolidated deficiency payments [106, p. 8].

Another source of gold and foreign currency reserves application is external public debt and the Government-guaranteed debt and the International Monetary Fund loans repayment and servicing. Practice demonstrates (Table 2.11) that the NBU spends significant funds that are part of the country's gold and foreign currency reserves on the above payments.

Table 2.11 Public Debt and the IMF Loan Repayment at Gold and Foreign Currency Reserves Cost [131, p. 2; 149, p. 54]

Payments for:	Year					
	2008	2009	2010	2011	2012	2013
external public debt and the Government-guaranteed debt repayment and servicing, USD, billion	1.256	1.56	1.8	2.8	4.3	6.6
by the IMF loans, USD, billion	–	–	–	–	3.5	5.7

The amount of payments on external public debt and the Government-guaranteed debt repayment and servicing in 2011 included support of foreign payments and receipts of the NJSC Naftogaz of Ukraine for the natural gas [114]. Government debt has a significant impact on gold and foreign currency reserves of Ukraine level. Government debt increase occurs due to the budget deficit. Y. Ivanenko, the Director of the Department of Public Debt, International Affairs and Financial Institutions of the Accounting Chamber of Ukraine, analyzing the reasons for the rapid increase in government debt, states: "The main reason for a government debt formation is the State budget imbalance, or rather, its deficit magnitude. Just for the deficiency payments, the government is forced to attract loans. The larger the budget deficit is, the greater is government debt. At that, a balanced budget adoption does not guarantee that the government will not be forced to resort to additional loans attraction. The feature of the Ukrainian budget process is a disguised deficit in the country's main financial document availability when it comes to the Pension Fund, large state corporations or organizations deficit financing" [73].

"Gold and foreign currency reserves of Ukraine have decreased due to the State debt repayment, high costs of energy carriers and adverse conjuncture of external commodity markets," S. Arbuzov considers. He noted that the reasons

for the country's gold and foreign currency reserves decline were significant volumes of the state debt repayment, which occurred in 2011–2012, exorbitant price of imported energy carriers and adverse conjuncture of external commodity markets. It was noted that cooperation with the International Monetary Fund should be renovated in the future, which would allow a share of the foreign exchange repayments refinancing, and resources at lower interest rates on external markets attracting, which in turn would result in gold and foreign currency reserves of Ukraine growth [120].

The recent financial crisis has become an impetus for determination a number of factors that directly affect gold and foreign currency reserves level, the gaps in which management resulted in FX reserves decrease. Thus, one of the reasons for the crisis phenomena in Ukraine development was government debt and the State balance of payments insufficient management [114].

Improvement of gold and foreign currency reserves management by the end of 2012 is noted in the quarterly economic report of the Ukrainian Economic Trends Forecast for the IV quarter of 2012 by the Da Vinci AG analytical group. According to the experts, the main risk to the reserves stability during this period was devaluation expectations; and the public demand is able to disrupt optimal devaluation scenario smoothness and result in the market sharp fluctuations and "collapses" [58].

The main objective of the National Bank of Ukraine in gold and foreign currency reserves management is optimal combination of the reserve assets security, liquidity and economic viability provision. Gold and foreign currency reserves management is important, since it is the FX reserves management that has a significant impact on their increase, which enables more effective exchange market interventions, thereby stabilizing the national currency of Ukraine exchange rate. Among FX reserves management tools, the placement tools are the most relevant. FX reserves increase can be achieved through effective placement of deposits and purchase of securities. The problem issue in FX reserves placement is the low yield from their management, as well as transparent information regarding the level, term and interest rate on deposits and information regarding countries of gold and foreign currency reserves funds placement lack. Risks of placing deposits in foreign banks are unexplored due to the information lack. FX reserves decrease is affected by their application process, namely, the consolidated balance of payments deficit financing, external public debt and government-guaranteed debt repayment and servicing and payments on the IMF loans.

Conclusions on Section 2

The main role in monetary policy in Ukraine, namely in terms of the national currency exchange rate regulation, is played by gold and foreign currency reserves. Gold and foreign currency reserves affect the exchange rate through exchange market interventions.

1. The interrelation between gold and foreign currency reserves level and the exchange rate, which is reflected in the fact that with FX reserves increase the national currency appreciation is observed, and vice versa, has been revealed. Given the FX reserves dynamics in recent years, it can be argued that Ukraine's gold and foreign currency reserves require improvement and management. Regarding the FX reserves structure, attention should be paid to the securities share that has increased over the past three years and the foreign currency and deposits share, which, on the contrary, has decreased. Measures should be taken to optimize gold and foreign currency reserves structure. FX reserves optimal structure formation will allow the NBU to properly perform its main function, i.e., ensuring the monetary unit of Ukraine stability.
2. In the study of gold and foreign currency reserves formation and management processes the problems, associated with complete information on their composition and structure lack, have emerged. The lack of information on the risks from the reserves placement, interest rates on deposits and loans obtained, as well as information on the yield on securities that are part of FX reserves of Ukraine, eliminates formation and management efficiency investigation. The issue, on which gold and foreign currency reserves formation and custody depends, namely the selection of FX reserves reserve currency, remains not investigated due to the lack of information on the official website of the National Bank of Ukraine and other official websites of Ukraine.
3. Among the investigated sources of gold and foreign currency reserves of Ukraine formation, none of the sources can significantly affect FX reserves increase. Internal sources are prospective, but their contribution is negligible against the country total reserves level. A significant increase occurs due to loans from international institutions (mainly the International Monetary Fund) and bonds of domestic and foreign government loans, but such sources application to increase gold and foreign currency reserves is not appropriate, since these funds will be required to be repaid and payed

interest in the future. Among the sources of management tools considerable attention should be paid to foreign currency purchase and sale, since the exchange rate stabilization can be achieved through exchange market interventions. In general, FX reserves increase is impossible to be achieved through the tools application, with exchange market interventions exception. An increase in Ukraine's gold and foreign currency reserves can be achieved through FX reserves placement tools improvement. After all, profit from invested funds and securities purchased is one of the most profitable tools of the state gold and foreign currency reserves management.

4. Thus, to achieve the exchange rate of Ukraine stabilization through exchange market interventions at gold and foreign currency reserves cost, attention should be paid to gold and foreign currency reserves of Ukraine management. After all, it is precisely due to effective management, resulting in FX reserves structure formation, and effective reserve funds placement the national currency exchange rate improvement is possible. Development of strategic plans for gold and foreign currency reserves placement and methodical recommendations on their formation and management will result in an increase in gold and foreign currency reserves level and, as a consequence, in the national currency exchange rate improvement.

The main provisions of Section 2 are reflected in the following works of the authors: [24; 25].

SECTION 3.
FOCUS AREA OF GOLD AND FOREIGN CURRENCY RESERVES MANAGEMENT IMPROVEMENT AS A FACTOR OF THE NATIONAL CURRENCY EXCHANGE RATE REGULATION BY THE STATE

3.1. State Regulation of the Foreign Currency Exchange Rate and Gold and Foreign Currency Reserves Management as Macroeconomic Regulation Components of the National Economy of Ukraine

The exchange rate analysis conducted in Section 2 has demonstrated that application of gold and foreign currency reserves for exchange market interventions is efficient for the national currency exchange rate stabilization. An important step towards the exchange rate stabilization is an organizational-economic mechanism of the exchange rate regulation determination. The proposed organizational-economic mechanism of the exchange rate regulation by the state is presented in Fig. 3.1.

This mechanism is aimed at decision-making regarding the exchange rate regulation adequacy. The task of state institutional authors is informed and optimized decisions making regarding the exchange rate regime selection, exchange market interventions, as well as resolution of issues regarding gold and foreign currency reserves management (primarily increase) and other issues related to the national currency exchange rate stabilization. Thus, the exchange rate stabilization (or fixation) should not be implemented by the National Bank exclusively; this process should be the Government's priority on the way to the economy as a whole stabilization. The whole mechanism, aimed at the national currency exchange rate stabilization, should be coordinated and function at the

state level at the Government expense; and the National Bank, according to Mundell-Fleming model, should implement the Government decisions aimed at the national currency exchange rate stabilization primarily by a fixed exchange rate setting.

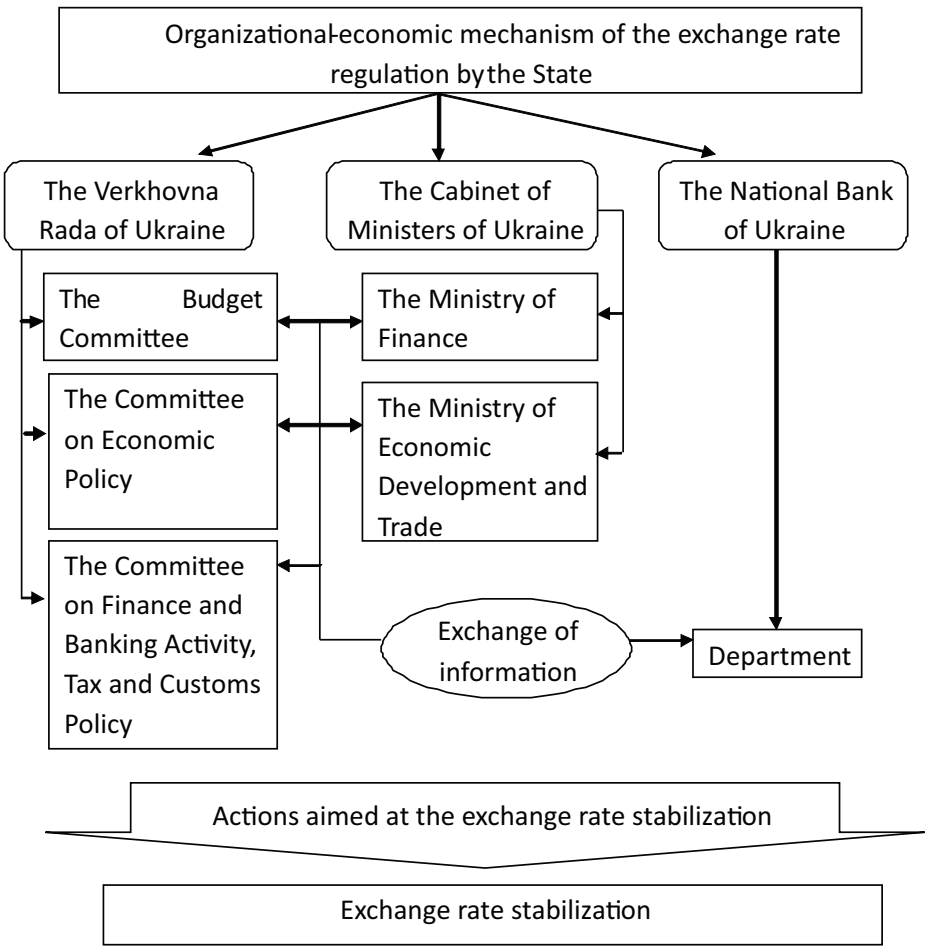

Fig. 3.1. Scheme of Organizational-Economic Mechanism of the Exchange Rate Regulation by the State (author's development)

Under a fixed exchange rate regime, the only monetary policy objective is its announced level support. In other words, the fixed exchange rate system essence is the supply of money regulation by the Central Bank to ensure the equilibrium exchange rate with the announced one coincidence. Moreover, if

the Central Bank is able to provide foreign currency purchase or sale under the fixed exchange rate, the change in money supply to the required volume is performed automatically [113, p. 529].

State regulation of the exchange rate is efficient due to the exchange rate in terms of its fixation (relatively stable, regulated) stabilization. This is confirmed by Mundell-Fleming model Fig. 3.2., which depicts how money supply is regulated under a fixed exchange rate regime.

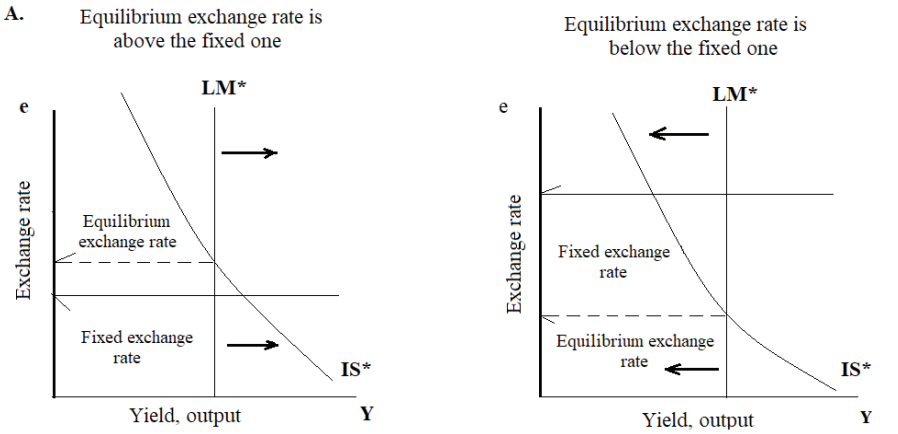

Fig. 3.2. Mundell-Fleming Models of the Money Supply Regulation under a Fixed Exchange Rate Regime [113, p. 530].

In Fig. 3.2 (A) the equilibrium exchange rate is above the fixed one; speculators make a profit by purchasing foreign currency on the market and then selling it to the Central Bank. At that, money supply automatically increases, LM curve shifts to the right, and the exchange rate decreases. In Fig. 3.2 (B) the equilibrium exchange rate is below the fixed one; speculators purchase dollars on the foreign currency market and get currency at the Central Bank for them. At that, money supply automatically declines, LM curve shifts to the left, and the exchange rate grows.

According to Mundell-Fleming model, foreign trade restrictions at a fixed exchange rate introduction results in completely different outcomes than at a floating exchange rate conditions. Foreign trade restrictions under a fixed exchange rate result in aggregate income increase. More importantly, they increase current accounts surplus as well (Figure 3.3) [113, p. 534].

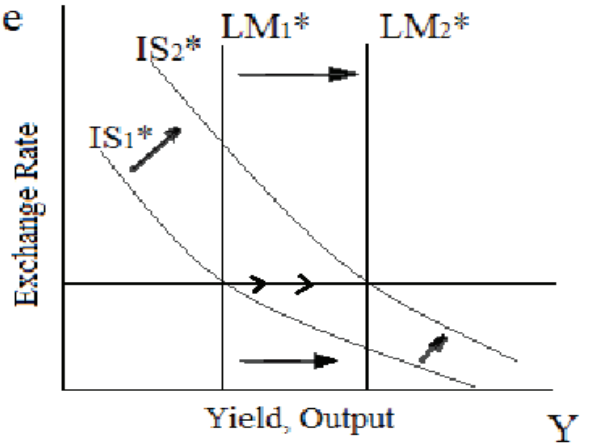

Fig. 3.3. Mundell-Fleming Models of Foreign Trade Restrictions under a Fixed Exchange Rate [113, p. 534].

According to Fig. 3.3 with tariffs and import quotas introduction the IS curve shifts to the right. This results in an increase in the supply of money necessary to maintain the exchange rate invariability, as a result, aggregate income increases. [113, p. 533-535].

To improve this mechanism efficiency (Fig. 3.1) the problems associated with gold and foreign currency reserves, namely, the lack of information on their composition and structure, should be eliminated. Analysis of gold and foreign currency reserves of Ukraine status has demonstrated problems associated with the lack of complete information on their composition and structure, as well as the lack of information on structure and amount of reserve currencies included in their composition. Composition of securities included in gold and foreign currency reserves is undefined due to the lack of information. An important objective on the way to FX reserves increasing is their structure modification. In view of this, a need for additional research and search for these problems solutions arises, which will be focused at:

– Information on gold and foreign currency reserves of Ukraine status disclosure;
– Determination of the countries-issuers of the securities included in gold and foreign currency reserves of Ukraine;
– Promotion measures to improve gold and foreign currency reserves structure identification.

Given information will contribute to decisions-making on the exchange rate stabilization issues. This information is needed for Government officials

and employees of the National Bank of Ukraine, as well as for analysts and foreign investors, to analyze the real situation on gold and foreign currency reserves status.

An important step towards the national currency exchange rate stabilization is public confidence in the national currency increase. This problem solution should be supported by the National Bank of Ukraine. One of the options for solving this problem is information on the FX reserves of Ukraine status full disclosure. Since complete and reliable information on FX reserves of Ukraine is currently not available, disclosure of information on gold and foreign currency reserves status by the National Bank of Ukraine should be recommended.

Information on the FX reserves status should be made public, which includes full disclosure on:

1) Gold and foreign currency reserves of Ukraine real level and obstacles and prospects of their increase. Information should be posted on the National Bank of Ukraine website. Video blog by an employee of the Department for Gold and Foreign Currency Reserves Management would also be relevant; it would be addressed to citizens of Ukraine with information on:
   – Gold and foreign currency reserves of Ukraine status;
   – Obstacles and prospects of gold and foreign currency reserves management;
   – Obtained loans and their repayment;
   – Other information that directly affects gold and foreign currency reserves status;
2) Composition and amount of foreign currency included in gold and foreign currency reserves of Ukraine. Such information can be posted on the National Bank of Ukraine website;
3) Placed international deposits included in gold and foreign currency reserves. Such information can be posted on the NBU website and media sources; It should contain information on the deposits amount and terms, the countries where the deposits are placed and interest rates on the deposits.
4) Securities included in gold and foreign currency reserves. Such information can be posted on the NBU website and media sources; It should contain the following information:
   – The issuing country;
   – The interest rate;
   – The term of repayment;
   – Interest rate risk on the given securities;
   – Other information refereed to the securities;

5) Obtaining international loans from the International Monetary Fund and foreign countries by the National Bank of Ukraine. The data should be available on the National Bank of Ukraine website and contain the following information:
   – The loans amount and interest rates thereon;
   – The loans repayment period and lending terms;
6) Other information.

A generalized scheme for information disclosure is presented in Fig. 3.4.

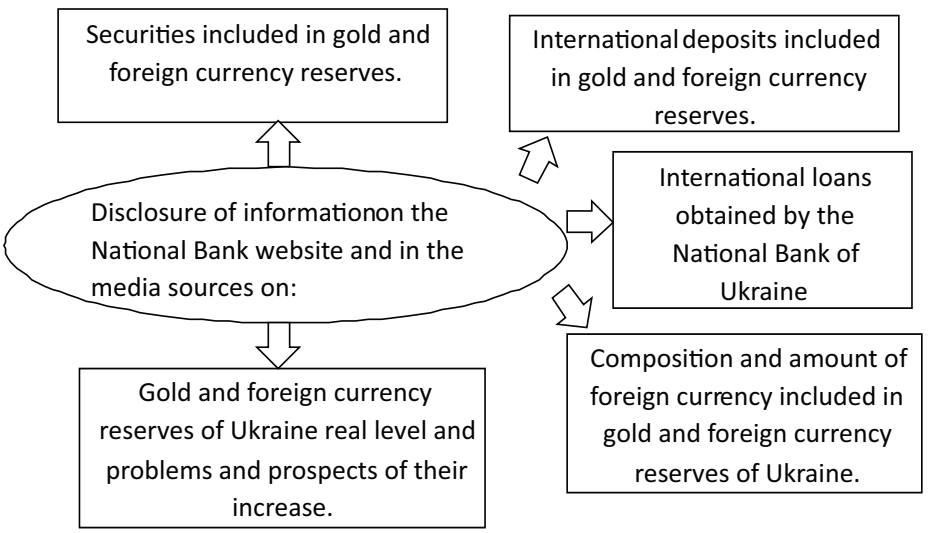

Fig. 3.4. Scheme of Information on Gold and Foreign Currency Reserves of Ukraine Real Status Disclosure (author's development)

Presented in Fig. 3.4 information that should be disclosed, may constitute a state secret. According to the Law of Ukraine "On the State Secret", in accordance with the procedure established by this Law, the following information may be classified to the state secret:

– In the field of economy: on the state reserves of precious metals of monetary group, precious stones, currency and other values, operations related to banknotes and securities issuance, their custody, security and protection against counterfeiting, circulation, exchange or withdrawal from circulation, as well as on other special measures of the state financial activity;
– In the field of external relations: on directives, plans, instructions to delegations and officials on foreign policy and foreign economic activity of Ukraine [136].

Information on gold and foreign currency reserves status may partially be classified to the state secrets, but the direct answer to the question of exactly what information on gold and foreign currency reserves of Ukraine shall be considered a state secret is not available on the National Bank of Ukraine website and other official Ukrainian websites. The answer to this question can be given by a state expert on the secrets issues. According to the Law of Ukraine "On the State Secret", state experts on the secrets issues shall be the President of Ukraine, the Chairman of the Verkhovna Rada of Ukraine, the Prime Minister of Ukraine in office and other officials to whom these functions in the relevant areas of the State activity are assigned by the President of Ukraine [136]

Given this situation, information on gold and foreign currency reserves of Ukraine real status disclosure by the National Bank of Ukraine is relevant (Fig. 3.4). The level of public confidence in the national currency will increase due to the full disclosure of information, which in turn will positively affect the national currency of Ukraine exchange rate stabilization.

Since, in the lack of information on securities included in gold and foreign currency reserves of Ukraine, consideration of prospects for the securities attraction to gold and foreign currency reserves of Ukraine is relevant, these recommendations consist of two stages.

At the first stage the list of securities to be attracted to gold and foreign currency reserves of Ukraine should be determined. These include:

– Debt securities (certificates of deposit and commercial papers), guaranteed by international financial institutions (the International Monetary Fund, the World Bank, the European Bank for Reconstruction and Development, etc.) or by the Central banks of the world leading countries;
– Government securities (bonds, treasury bills, etc.), guaranteed by the State and marked by the leading rating agencies (Standard & Poor's, Moody's, Fitch, etc.).

The second stage is the credit rating of the world's securities issuers determination according to such rating agencies as Moody's, Standard & Poor's and Fitch. The company's credit rating is a financial indicator to potential investors in such securities as bonds. Credit rating is a common financial instrument for securities, such as bonds issued by a corporation.

Standard & Poor's is a subsidiary of McGraw-Hill, engaged in analytical studies of the financial market. Standard &Poor's is one the three most influential international rating agencies. S&P is also known as the American stock index S&P 500 and the Australian S&P 200 creator and editor. Standard & Poor's ratings for trusted companies, unlike unreliable ones, have the following form:

AAA, AA +, AA, AA-, A +, A, A, BBB +, BBB, BBB-, BB +, BB, BB-, B +, B, B-, CCC +, CCC, CCC-, CC, C, D. Anything lower than the BBB- rating is considered to be speculative bonds [79].

Moody's is a short name for Moody's Investors Service, which is one of the world's largest and most reputable rating agencies. The company evaluates the borrowers credit rating on a standardized scale, as well as conducts research and analysis of commercial and government institutions. The company's share in the global credit rating market is about 40%. The Moody's rating system is similar in concept, but the names look different. Trusted companies, unlike unreliable ones, look like this: Aaa, Aa1, Aa2, Aa3, A1, A2, A3, Baa1, Baa2, Baa3, Ba1, Ba2, Ba3, B1, B2, B3, Caa1, Caa2, Caa3, Ca, C [79].

Fitch is one of three leading rating agencies. It is a member of Fitch Group. In addition to credit agencies, the group includes Fitch Solutions, a company involved in Fitch Ratings products and services marketing. In addition, the group includes Algorithmics, which is one of the world leaders in companies' risks assessment area. Fitch Rating Agency identifies the best companies, other than unreliable, as follows: AAA, AA +, AA, AA-, A +, A, A, BBB +, BBB, BBB-, BB +, BB, BB-, B +, B, B-, SSS, DDD, DD, D [79].

According to Moody's, Standard & Poor's and Fitch rating agencies the countries with the highest credit rating are presented in Table. 3.1.

Table 3.1 Credit Rating of the Leading Countries According to Moody's, Standard & Poor's and Fitch Rating Agencies as of the end of 2013 (developed by the authors on the basis of Appendix F)

Country	Rating		
	Standard & Poor's	Moody's	Fitch
Austria	AA+	Aaa	AAA
Australia	AAA	Aaa	AAA
Canada	AAA	Aaa	AAA
Denmark	AAA	Aaa	AAA
Finland	AAA	Aaa	AAA
Germany	AAA	Aaa	AAA
Norway	AAA	Aaa	AAA
Sweden	AAA	Aaa	AAA
Switzerland	AAA	Aaa	AAA
Singapore	AAA	Aaa	AAA
USA	AA+	Aaa	AAA
UK	AAA	Aa1	AA+

Debt and government securities issued by countries presented in Table. 3.1 should be placed in securities portfolio included in gold and foreign currency reserves of Ukraine.

Another factor that should be considered when selecting the securities issuing country is gold and foreign currency reserves of the country level. Data on gold and foreign currency reserves of the countries with the highest credit rating is presented in Table 3.2 to determine the issuer countries the securities of which should be held in gold and foreign currency reserves composition.

Given the data presented in Tables 3.1 and 3.2, custody of securities included in gold and foreign currency reserves issued by Switzerland, Singapore, Germany, the United States and the United Kingdom is prospective for Ukraine's gold and foreign currency reserves development. Custody of securities issued by these countries in gold and foreign currency reserves of Ukraine composition, will increase the FX reserves level and reliability and, as a consequence, stabilize the national currency exchange rate.

Table 3.2 Gold and Foreign Currency Reserves of the Countries that have the Highest Credit Rating, as of the end of 2013 (developed by the authors on the basis of Appendix F)

Country	Gold and foreign currency reserves USD, million
Switzerland	535,882.90
Singapore	273,065.10
Germany	198,249.76
USA	144,373.70
UK	134,966.00
Denmark	87,987.71
Canada	71,937.00
Sweden	65,379.00
Norway	59,842.00
Australia	52,733.07
Austria	23,297.14
Finland	10,923.03

Yield on securities of the world leading countries analysis is relevant to determine appropriateness of placing securities in gold and foreign currency reserves of Ukraine composition. Yield on bonds issued by the world leading countries is presented in Table 3.3. An analysis of bonds as of the end of 2013, the custody period of which does not exceed 6 months, 1 year, 2 years, 3 years, 5 years and 10 years has been conducted.

Table 3.3 Rates on Bonds of the World Leading Countries, data as on the End of 2013 (author's development on the basis of [37])

Country	Rates on Bonds					
	6 months	1 year	2 years	3 years	5 years	10 years
Australia		2.51	2.64	2.98	3.44	4.14
Norway	1.49	1.47	1.43		2.18	2.79
UK	0.39	0.38	0.48	0.77	1.62	2.73
USA	0.08	0.10	0.30	0.66	1.47	2.69
Singapore		0.32	0.37		1.38	2.47
Canada	0.91	0.95	1.00	1.20	1.65	2.44
Sweden	0.70		0.89		1.49	2.23
Finland			0.17	0.38	0.95	1.97
Austria		0.17	0.13	0.26	0.79	1.93
Denmark		0.15	0.21	0.35	0.82	1.67
Germany	0.09	0.11	0.11	0.15	0.64	1.66
Switzerland		0.07			0.22	1.01

The analyzed data of Table 3.3 indicate that placement securities in gold and foreign currency reserves composition is inefficient, since, on the example of bonds issued by the world leading countries, the yield is low and ranges from 0.07 to 4.14% per year. Thus, Ukraine's gold and foreign currency reserves structure should be improved, and the changes should be aimed at foreign currency and deposits as compared to securities increase. Due to such circumstances, placement funds in deposits or these funds investment in risk-free sectors of the Ukrainian economy is prospective for gold and foreign currency reserves level.

Gold and foreign currency reserves of Ukraine structure is specific in comparison with the world leading countries. This can be explained by the fact that the Ukrainian economy is not sufficiently developed as compared to other countries. It is confirmed by the data presented in Table 3.4.

Table 3.4 Structure of Gold and Foreign Currency Reserves of the World Leading Countries (author's development on the basis of Appendix F)

Country	Reserves in foreign currency,%	Reserve position in the IMF,%	SDR,%	Gold,%	Other reserve assets, %
Austria	34.65	6.82	11.77	46.35	0.42
Australia	79.85	4.56	8.99	5.80	0.81
Canada	81.22	6.59	12.06	0.16	0.00

Finland	57.72	8.50	15.81	17.95	0.02
Germany	18.56	5.37	8.76	67.31	0.00
Norway	85.56	2.36	3.82	0.00	8.27
Sweden	84.70	2.74	5.08	7.48	0.00
Switzerland	91.17	0.48	0.90	7.45	0.00
Singapore	98.94	0.38	0.49	0.08	0.11
USA	29.51	21.22	38.08	7.65	3.54
UK	68.37	7.04	13.35	11.24	0.01
Reference data:					
Ukraine	91.08	0.00014	0.19	8.74	0.00

Since the National Bank of Ukraine cannot directly affect the reserve position in the International Monetary Fund and Special Drawing Rights increase, and the country gold reserves level is sufficient for our economy (since gold reserves of Ukraine are not lower than that in the USA, Canada, Switzerland, Sweden, etc.), management of reserves in foreign currency improvement is relevant. It appears that for their efficient management reserves in foreign currency, included in gold and foreign currency reserves of Ukraine, need to be developed in two areas:

1. Increase foreign currency and deposits share in gold and foreign currency reserves composition, which profitability is higher as compared to securities.
2. Improve foreign currency and deposits, included in gold and foreign currency reserves of Ukraine, management. A model for the funds of gold and foreign currency reserves of Ukraine application should be developed to implement this trend.

Information on gold and foreign currency reserves of Ukraine status disclosure is relevant for gold and foreign currency reserves effective management on the way to the national currency exchange rate stabilization. The action aimed at disclosing information on gold and foreign currency reserves of Ukraine real status will enable the governing authorities of the country to effectively implement policies aimed at the national currency exchange rate stabilization given the actual circumstances. The level of public confidence in the national currency will increase due to the mentioned methods application, which in turn will positively affect the national currency of Ukraine exchange rate stabilization.

According to the results of comparative analysis of gold and foreign currency reserves of Ukraine and the world leading countries structure, two areas of FX of Ukraine development are determined. The first area is aimed at increasing foreign currency and deposits share in gold and foreign currency

reserves composition. The second area calls upon the leadership of the country and the National Bank of Ukraine to develop models for foreign currency and deposits included in gold and foreign currency reserves of Ukraine efficient management. According to analysis of credit risks and gold and foreign currency reserves of the world countries level, custody of securities included in gold and foreign currency reserves issued by Switzerland, Singapore, Germany, the USA and the United Kingdom is expedient for Ukraine.

3.2. Gold and Foreign Currency Reserves of Ukraine System and Managerial Setup Improvement

One of the ways to significantly improve the economic situation in Ukraine, as well as overcome economic fluctuations consequent effects, is the country's gold and foreign currency reserves increase. Due to gold and foreign currency reserves of Ukraine increase the national currency exchange rate stabilization and the Ukrainian Hryvnia position on the international markets strengthening become possible. Gold and foreign currency reserves increase can be achieved through: formation sources and their management improvement, search for new formation sources and investing funds in FX reserves, as well as developing an optimization structure for gold and foreign currency reserves of Ukraine management.

A significant increase in gold and foreign currency reserves due to FX reserves of Ukraine sources improvement is impossible to be achieved. In part of internal sources of FX reserves formation, no tool which can be significantly influenced is available. Funds issuance and the consolidated balance of payments of Ukraine funds distribution are impossible to be influenced. The National Bank of Ukraine may affect the funds issuance, but all these funds in full will not be credited to gold and foreign currency reserves composition. Among domestic sources of FX reserves formation only one source which can be influenced by the National Bank of Ukraine is available, namely: the NBU profits distribution. Revenues increase is not the NBU main objective. Profit can be increased by cutting costs: cutting staff costs, as well as administrative, economic and other expenses.

When applying the monetary gold purchasing tool, FX reserves increase cannot be influenced. Although in this case the reserves do increase, but such an increase in FX reserves cannot be used in their management, as well as profit

from it; such increase can be used as insurance against risks and economic crises. A close margin from monetary gold custody is its appreciation. As practice demonstrates, one ounce of monetary gold price increases each passing year and as a result, when converting the monetary gold value in gold and foreign currency reserves of Ukraine composition, the increase occurs. A disadvantage of monetary gold in FX reserves composition use is that it is in custody in ingot bars and could be used only through these ingot bars sale.

A slight increase in FX reserves can be achieved through formation sources with funds attraction tools application. A group of gold and foreign currency reserves formation tools, due to which FX reserves of Ukraine increase achievement is possible, are the funds attraction tools. Increase through bonds of domestic and foreign government loans issuance does not affect FX reserves level to a significant extent. Although the amount of these bonds issuance is significant for a year (about UAH 63 billion of bonds of domestic government loans and USD 4.855 billion of bonds of external government loans in 2012 [114], these funds are not fully credited to FX reserves composition. One of the problems of gold and foreign currency reserves increasing by issuing bonds of domestic and foreign government loans is that these funds will be required to be repaid and payed interest in the future. Another tool to which these problems can be attributed is attracting funds in Ukraine and abroad. Funds for increasing FX reserves attraction in Ukraine is a prospective area. The advantage of attracting funds in Ukraine is due to the fact that these funds can be borrowed by the National Bank of Ukraine on preferential terms. The increase in FX reserves of Ukraine can be achieved through their effective management, namely, investing in goods and services production.

Given the situation that has developed with FX reserves of Ukraine in recent years, namely, the lack of transparent information on foreign currency composition, placement sources, securities included in gold and foreign currency reserves composition, as well as considering the trend of gold and foreign currency reserves decline, we consider that an important factor that will directly affect the situation with gold and foreign currency reserves of Ukraine formation and management improvement is the Department for FX Reserves of Ukraine Management on the NBU basis structure improvement.

The Department objectives will be aimed at FX reserves increasing by overcoming the barriers in the way of these reserves increasing. The Department shall perform the NBU functions in the part related to gold and foreign currency reserves formation and management. The Department for Gold and Foreign Currency Reserves Management main objective is the FX

reserves level increase, such an increase can be achieved through secondary objectives of the Department implementation, namely: search of placement sources for the funds included in FX reserves; full disclosure of information on FX reserves of Ukraine; search of FX reserves formation sources; FX reserves structure optimization; new programs for FX reserves formation and management development.

To achieve the objectives, the National Bank of Ukraine management structure in terms of gold and foreign currency reserves management should be analyzed and improved. The proposed Department should include structural divisions, as well as individual experts to perform relevant management functions or their part (Fig. 3.5).

Fig. 3.5. Organizational Chart of the Department for Gold and Foreign Currency Reserves of Ukraine Management (author's development)

The main components of the Department for Gold and Foreign Currency Reserves of Ukraine Management are: Director of the Department for Gold and Foreign Currency Reserves Management, Deputy Director, Legal Division, Division of Analytical and Methodological Support, Executive Division, Statistical Department, Public Relations Division, International Relations Division, Expert Division and the Panel of Experts of the NBU. On the National Bank of Ukraine approval, the Department for Gold and Foreign

Currency Reserves of Ukraine Management can include other divisions as well as possibility of delegate powers on gold and foreign currency reserves management to the existing structural divisions and departments of the National Bank of Ukraine rather than creating separate divisions.

For the Department for Gold and Foreign Currency Reserves Management effective functioning rights and responsibilities of each employee of this Department should be clearly delineated. Given the precise performance of each employee functions, the Department's operation will be successful, which will enable the country's FX reserves effective formation and management. The following rights and responsibilities of the Department employees are basic; they can be revised or modified by the National Bank of Ukraine when applicable.

The powers of the Director of the Department for Gold and Foreign Currency Reserves of Ukraine Management include:

– Main objectives and principles of FX reserves formation and management determination, as well as gold and foreign currency reserves development programs formation;
– Making decisions on exchange market interventions for the national currency exchange rate stabilization;
– Making final decision on signing agreements related to gold and foreign currency reserves of Ukraine management;
– Making decision on information on agreements associated with the FX reserves formation and management disclosure;
– Identification of information constituting a state secret;
– Internal financial controls implementation.

The Director of the Department reports monthly to the Head of the National Bank of Ukraine on gold and foreign currency reserves level as of the first day of the current month, and the minimum required level for the effective use as of the first day of the following month (as appropriate, the minimum required level as of the beginning of the following year). Monitors gold and foreign currency reserves of Ukraine liquidity and yield. Performs other functions that contribute to gold and foreign currency reserves of Ukraine efficient development.

The Deputy Director delegates the orders of the Director of the Department for FX Reserves of Ukraine Management and verifies their timely implementation; pre-verifies the documents submitted for the Director signature correctness; distributes signed documents to be executed and ensures organizational activities related to the Department functioning implementation; ensures, within the authority limits, state secrets in relation to gold and foreign

currency reserves implementation, control over its preservation. In the absence or on instructions of the Director coordinates the work of the Department.

The Division of Analytical and Methodological Support responsibilities are methodical and methodological support of the Department's functioning, determination of basic prospect directions and amounts of gold and foreign currency reserves allocation, namely, for the exchange market interventions, payments on loans obligations, deposits placements, investments amounts, etc. Operational decisions-making on standard operations related to gold and foreign currency reserves management implementation. Draft projects for gold and foreign currency reserves formation and management development.

The Executive Division responsibilities include monitoring compliance of the contracts terms concluded during FX reserves management; ensuring information accuracy and completeness for each contract concluded; documents drafting and monitoring over the concluded contracts payment processes.

The Legal Division responsibility is full legal support in gold and foreign currency reserves formation and management process, development of regulatory documents and control over the transactions correctness. The Legal Division drafts contracts, various kinds of acts and other business papers. If appropriate, files statements of claim, reclamations, pleads the Bank's cases in judicial and administrative institutions.

The Public Relations Division objectives is disclosure of information on gold and foreign currency reserves of Ukraine status in mass media. Publication of the Director of the Department appeals on FX reserves of Ukraine status, FX reserves development problems and prospects on the National Bank of Ukraine website. The Division objectives also include collection of information on the domestic expectations towards the national currency and FX reserves status and conducting social surveys on the topic.

The International Relations Division controls activities related to gold and foreign currency reserves formation and management outside our state. The Division objective is search of advantageous terms for placing deposits and, if appropriate, search of options for obtaining loans from abroad. The Division provides information to the Director of the Department on international markets, exchanges, etc.

The Statistics Division functions are:

– Participation in gold and foreign currency reserves development programs design and implementation;
– On the order of the Director of the Department: statistical information publicity and openness provision, its compilation methodology determination;

– Participation in development and expert estimation of projects related to FX reserves management;
– Submission of proposals, on the processed statistical data basis, on FX reserves formation and management;
– Submission of annual, quarterly or monthly (daily) reports on the FX reserves status, as well as on the national currency status against the same periods.
– Other functions to ensure the main objectives of the Department.

The Expert Division authority includes restrictions regarding the level of maximum risk that may arise in FX reserves management establishment; contracts expediency verification; submission of proposals for consideration regarding expediency, efficiency and profitability of gold and foreign currency reserves funds investment into the Ukrainian economy, as well as in relation to other options for FX reserves funds placement. In case of independent decision-making impossibility, requests assistance from the Panel of Experts of gold and foreign currency reserves.

The main feature of the Department for Gold and Foreign Currency Reserves Management is the FX reserves Panel of Experts. The FX reserves Panel of Experts is the involvement leading experts of Ukraine by the Expert Division in discussion and decision-making on gold and foreign currency reserves of Ukraine funds placement. The Panel of Experts is convened on the basis of the Expert Division invitation to discuss issues related to gold and foreign currency reserves investment into the economy of Ukraine, or beyond. The Panel of Experts personnel composition is non-permanent and depends on FX reserves funds investment (deposit) project. Employees of the Ministries of Ukraine, members of the Verkhovna Rada, the President of Ukraine, employees of the National Bank of Ukraine, leading experts and other members of the Panel, as appropriate, may be the members of the Panel of Experts of FX reserves. The Panel of Experts meeting takes place with the Division of Analytical and Methodological Support, Legal and Statistical Division and, as appropriate, other Divisions participation. The meeting is chaired by the Director of the Department, in the event of his absence – by the Deputy Director. The result of the Expert Division activity and, as appropriate, the FX reserves Panel of Experts is submission of a report on the opportunity (lack of opportunity) of investing or depositing funds of gold and foreign currency reserves of Ukraine.

Functioning of the Department on the National Bank of Ukraine basis improvement will enable to efficiently manage gold and foreign currency reserves. Given the Department precise functioning in FX reserves formation and management process, gold and foreign currency reserves level will be

increased. The Department for gold and foreign currency reserves management operation should be aimed at:

– Transparent information base on FX reserves of Ukraine status creation;
– Efficiency of FX reserves funds attraction and placement increase;
– FX reserves structure optimization.

Due to the Department functioning improvement a clear balance of tasks and responsibilities that arise in gold and foreign currency reserves of Ukraine management can be achieved, which will affect FX reserves funds formation and application efficiency. As a result of these changes gold and foreign currency reserves level will increase, which will enable Ukraine to repay internal and external debts, as well as stabilize the national currency exchange rate.

The result of the Department for Gold and Foreign Currency Reserves Management functioning will be achievement maximum efficiency when FX reserves investing. Fig. 3.6 presents an option to solve the problem of gold and foreign currency reserves funds investing in national production and each member of the Department responsibilities and functions in this problem solving process.

Clarification regarding the Department for Gold and Foreign Currency Reserves of Ukraine Management functioning on the example of investing FX reserves funds into the national production (according to Fig. 3.6):

1) Submits projects on investment in national production to the Deputy, who allocates responsibilities in the Department, for verification;
2) Gives orders concerning projects on gold and foreign currency reserves funds investment drafting;
3) Files request for statistical information regarding the project;
4) Presents statistical data and proposals based on the refined statistical figures on the project implementation;
5) Files an application for the national market and domestic enterprises monitoring for the purpose of concluding a production contract;
6) Presents information on the market situation and conditions under which the enterprises agree to sign the production contract;

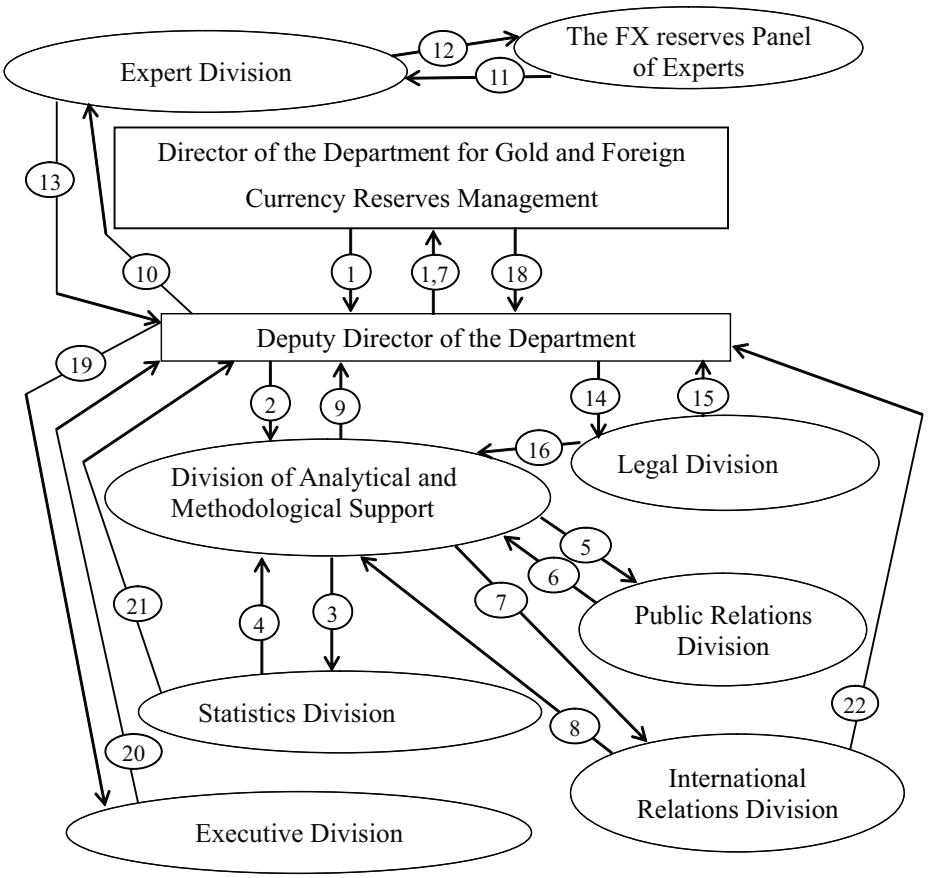

Fig. 3.6. The Department for Gold and Foreign Currency Reserves of Ukraine Management Layout (author's development)

7) Files request for the finished products market research on the international markets.
8) Presents data on the international markets situation and a list of products that can be exported abroad;
9) Submits draft contracts which can be concluded with domestic enterprises for consideration;
10) Submits draft agreements for consideration regarding expediency, efficiency and profitability of investing gold and foreign currency reserves into the Ukrainian economy, as well as in relation to other options for the FX reserves funds placement;

11) Relegates complex issues related to gold and foreign currency reserves investment for consideration and discussion on the basis of The Panel of Experts of the NBU convocation and with Heads of other Divisions of the Department participation;
12) draws up a report on the contracts submitted for consideration on the basis of the Panel of Experts of the National Bank of Ukraine convocation;
13) Reports on the investments feasibility and other possible options;
14) Relegates the agreed documents for legal verification.
15) Relegates the received documents back for the signature with possible amendments;
16) Relegates the documents back for revision if they do not comply with the legislation of Ukraine or the laws of foreign countries;
17) Relegates the draft agreements for the Director of the Department consideration;
18) Announces the contracts signing and gives orders regarding their implementation;
19) Relegates information on the concluded contracts and their execution terms, as well as orders for the funds under the contracts distribution;
20) Reports on the contracts terms implementation and observance, as well as information on doubtful contracts;
21) Submits annual, quarterly, monthly (as appropriate, daily) report on the signed contracts;
22) Gives orders for information on the contracts terms disclosure;
24) Provides information on economic activities on the international markets that directly affect the signed contracts.

The presented scheme of the Department for Gold and Foreign Currency Reserves of Ukraine Management layout (Fig. 3.6) confirms each member of the Department importance and necessity, as well as significant contribution to FX reserves management development due to the Expert Division and the Panel of Experts of the National Bank of Ukraine introduction.

Department for Gold and Foreign Currency Reserves of Ukraine Management layout (Fig. 3.6) will enable to improve gold and foreign currency reserves management in three areas, namely:

– Qualitative;
– Quantitative;
– Organizational.

Changes in the Department for Gold and Foreign Currency Reserves of Ukraine Management layout, which will emerge due to its improvement and its members' responsibilities modification is presented in Fig. 3.7.

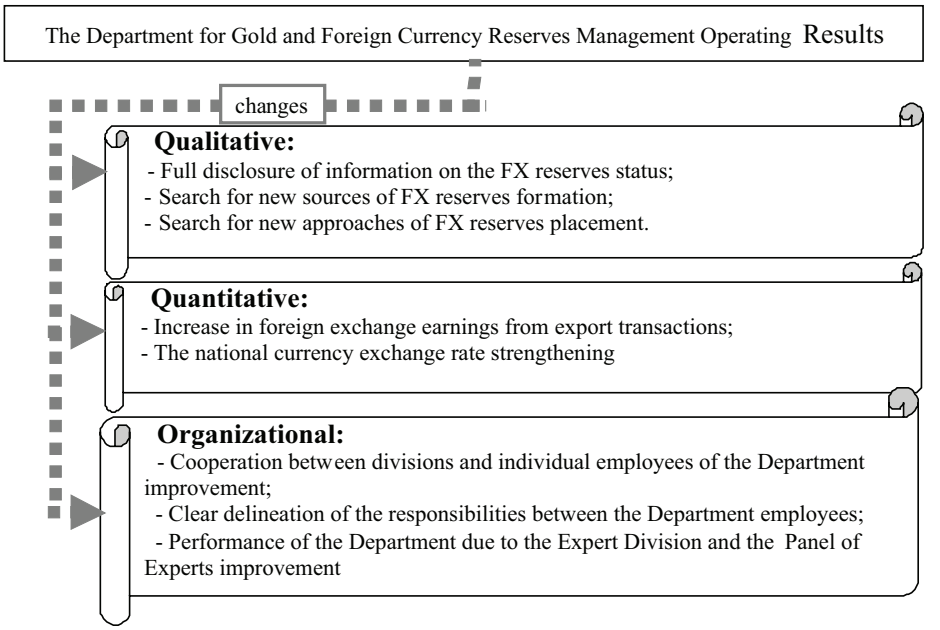

Fig. 3.7. Results of the Department for Gold and Foreign Currency Reserves of Ukraine Management Layout Improvement (author's development)

The results of qualitative, quantitative and organizational changes in the Department for Gold and Foreign Currency Reserves Management layout are:

– Gold and foreign currency reserves of Ukraine level increase;
– The national currency exchange rate stabilization;
– Stabilization of the Ukrainian economy as a whole.

Gold and foreign currency reserves significant increase is impossible to be achieved through the FX reserves sources improvement, the increase can be achieved through their effective management. A prospective area to increase the FX reserves funds is tools included in FX reserves application to improve the national production. It is the investing in domestic production that will contribute to: firstly, the economy development and crisis phenomena in the country overcoming; secondly, FX reserves increase due to the sale of the finished products; thirdly, exports in the country improvement, as well as positive balance of export-import relations achievement.

Changes in the national currency exchange rate through gold and foreign currency reserves level increase can have a positive impact on Ukrainian exports. The result of such changes in the Ukrainian economy is the national currency exchange rate stabilization and the Ukrainian Hryvnia position on the international markets strengthening. An important condition for the goals achievement is improvement gold and foreign currency reserves management. Such an improvement can be achieved through the Department for Gold and Foreign Currency Reserves of Ukraine Management layout improvement. Through the changes in the Department layout and its functions and responsibilities subsequent modification, efficiency of gold and foreign currency reserves management improvement, as well as their increase in the future can be achieved.

The Department for Gold and Foreign Currency Reserves Management activities should be directed at qualitative, quantitative and organizational changes that will result in the increased level of gold and foreign currency reserves of Ukraine, the national currency exchange rate and the economy of Ukraine as a whole stabilization.

3.3. Optimization Model of Gold and Foreign Currency Reserves Management as a Factor of Exchange Rate Strengthening and the National Economy of Ukraine Macroeconomic Stabilization

The analysis of gold and foreign currency reserves of Ukraine status conducted in Section 2 has demonstrated that their level is not sufficient for the effective national currency exchange rate regulation, given this, the need to address issues related to their level increase arise, namely:

– Search for the new methods to increase gold and foreign currency reserves level;
– Models of gold and foreign currency reserves of Ukraine funds effective application development.

One of the main reasons for gold and foreign currency reserves of Ukraine level increase is the need to influence the national currency of Ukraine exchange rate. Such an influence can be realized through the factors by which it is formed stabilization. One of the main factors, by which the national currency

of Ukraine exchange rate is formed, is gold and foreign currency reserves level and export-import relations balance. One of the prospective areas of exports increase is gold and foreign currency reserves of Ukraine funds application, namely investing these funds in domestic production.

The data analyzed in Table 3.5 indicate that exports of products and services do not cover imports, a negative trend of this indicator decrease is observed as well. This suggests that Ukraine needs new methods to increase goods and services exports and decrease imports. Due to such changes, the national currency exchange rate stabilization can be achieved, which, in turn, will strengthen the national currency exchange rate and the economy of Ukraine as a whole.

Table 3.5 Foreign Trade of Ukraine in 2007-2013 (developed by the authors based on [58, p. 11; 60, p. 12])

Year	Indicator			
	export, USD, million	import, USD, million	balance, USD, million	export-import coverage ratio
2007	58,335.0	65,598.6	-7,263.6	0.89
2008	78,708.6	92,003.3	-13,294.7	0.86
2009	49 294,0	50,606.6	-1,312.6	0.97
2010	63,164.6	66,189.9	-3,025.3	0.95
2011	82,186.4	88,843.4	-6,657.0	0.93
2012	82,408.9	91,394.2	-8,985.3	0.90
2013	76,450.2	84,584.7	-8,134.5	0.90

One of the main areas of increasing exports to stabilize the national currency of Ukraine exchange rate is to increase the exported finished products manufacturing. Such an increase can be achieved by investing gold and foreign currency reserves funds in manufacturing the products that are in demand in other countries.

The data analyzed in Table 3.5 indicate that for the negative balance of foreign trade decrease the increase in export of goods is relevant, since the balance of goods is negative, and the balance of services is positive for the analyzed period. The trend of the negative balance of goods increase is observed from 2009.

Exports increase can be achieved though:

– Exported products manufacturing increase;
– Exports geography expansion;
– Services share in export relations increase;

– Analysis of foreign markets for manufacturing and supply of goods and services that are in demand;
– Gold and foreign currency reserves funds attraction into the domestic production.

Table 3.6 Foreign Trade Balance in 2007-2013 (developed by the authors based on [58, p. 11; 60, p. 12])

Foreign trade balance	Year						
	2007	2008	2009	2010	2011	2012	2013
Goods	-11,321.9	-18,569.0	-5,737.4	-9,337.0	-14,214.0	-15,848.3	-14,361.5
Services	4,058.3	5,273.3	4,424.8	6,311.7	7,557.0	6,863.0	6,227.0
Total	-7,263.6	-13,295.7	-1,312.6	-3,025.3	-6,657.0	-8,985.3	-8,134.5

An increase in goods and services exports in Ukraine will positively affect the national currency exchange rate, as an interrelation between the exchange rate and foreign trade in Ukraine is observed (Fig. 3.8).

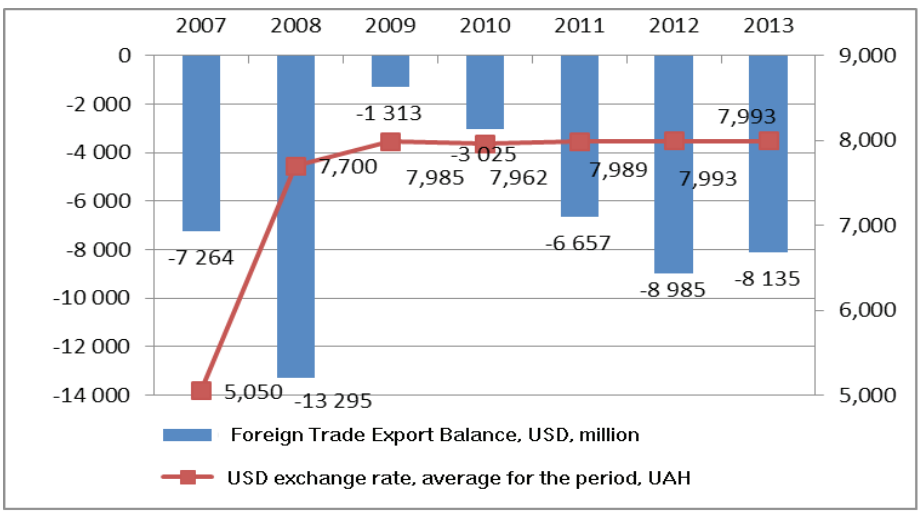

Fig. 3.8. Dynamics of Foreign Trade and the Official Hryvnia Exchange Rate in Ukraine in 2007-2013 (developed by the authors based on [59, p. 11; 114])

In the period of the negative balance of foreign trade increase, an increase in the national currency exchange rate is observed. In 2008, as compared to 2007, an increase in the negative balance of foreign trade (almost twice) is observed, which influenced a sharp increase from 5.05 to 7.7 UAH/USD in the national

currency exchange rate. In the period of the foreign trade balance decrease in 2010-2012, there was a slight increase from 7.962 to 7.993 UAH/USD in the national currency exchange rate. Since the close interrelation between the currency exchange rate and external trade is observed, the increase in exports is a relevant source of the national currency exchange rate stabilization.

Attraction and application gold and foreign currency reserves of Ukraine funds in the finished products manufacturing is a prospective area for goods and services exports increase. The advantage of such a solution is due to the fact that: firstly, the state does not need to search for new sources of investment in domestic production; and secondly, due to an increase in exports, the negative foreign trade balance will be decreased. The result of decrease in the negative balance of foreign trade and increase in gold and foreign currency reserves level is the national currency of Ukraine exchange rate stabilization.

Accurate and informed decisions are required at the current stage of the Ukrainian economy development, which are impossible to be adopted without introduction and application of modern means of information processing, which will be aimed at activities of the National Bank of Ukraine analysis, assessment and estimation in terms of gold and foreign currency reserves management. The problem can be solved through the optimization techniques application. A predictive optimization model based on the classical commodity profit model has been developed in the process of the research. The developed model is aimed at profits from gold and foreign currency reserves application maximization and provides an opportunity to predict the main factors affecting its level.

To increase gold and foreign currency reserves level and the decrease negative balance of export-import relations, an optimization model has been developed. In Economics economic-mathematical problems, aimed at the best (optimal) option for resources application from some criterion (criteria) standpoint identification are called optimization models. Such optimization problems are solved by mathematical programming methods. The proposed model essence is investment gold and foreign currency reserves funds of Ukraine in the exported products manufacturing and exported services provision.

Stages of the optimization model implementation in the economy of Ukraine (Fig. 3.9):

1. Determination of funds included in gold and foreign currency reserves amount that can be used for the model.
2. Determination of export industries for investment.

3. Determination of investments in projects for each branch of the domestic production in Ukraine amount on the basis of the following analyzed data:
   – Determination of the industry profitability for the investment ROI analysis;
   – Determination of the minimum and maximum investment amount for a project;
   – Determination of the investment payback period and their return.
4. Risks identification for each industry.
5. Optimization model calculations and final decision-making.

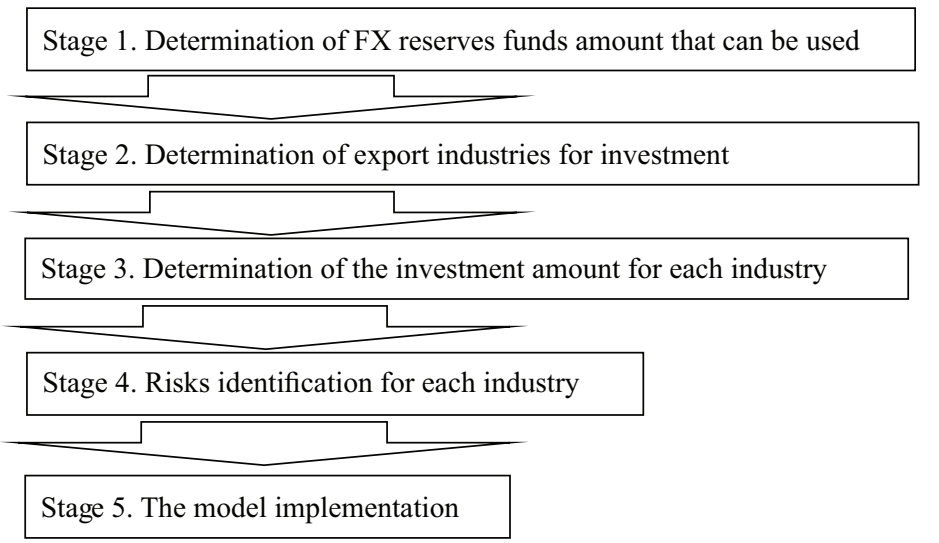

Fig. 3.9. Stages of the Optimization Model Implementation (author's development)

On the first stage of the optimization model implementation the amount of investment funds should be determined. The amount will be determined by the National Bank of Ukraine on the basis of the country FX reserves level. We have proposed to use funds in the amount of USD 357.7 million (357.7 is the profit from activities with gold and foreign currency reserves in 2012). The amount may be increased at the cost of deposits and currency included in FX reserves. Such funds can be returned deposits and the difference between funds for exchange market interventions and the amount of funds for the planned exchange market interventions for the next financial year.

On the second stage industries in which to invest gold and foreign currency reserves of Ukraine funds should be determined. These industries should be engaged in products export and exported services provision. The list of the

industries is determined by the NBU on the basis of convening the Panel of Experts, which should include representatives of:

– The National Bank of Ukraine;
– The Ministry of Agrarian Policy and Food of Ukraine;
– The Ministry of Economic Development and Trade of Ukraine;
– The Ministry of Energy and Coal Industry of Ukraine;
– The Ministry of Finance of Ukraine;
– And others, as appropriate.

The list of the Ministries of Ukraine representatives is obligatory, as only they will be able to characterize their industries market situation.

On the third stage, based on the Panel of Experts convening, the experts determine: the projects profitability in each sector of the economy, the minimum and maximum amount of investment in the projects and the investments payback period and their return.

On the fourth stage, by the National Bank of Ukraine order, the leading rating agencies, both domestic and foreign, will determine the risk of the funds non-repayment for each project in which it has been agreed to invest.

On the fifth stage the optimization model calculations will be made and the final decision to invest a particular amount of funds in the sectors of the economy for export products manufacturing and services provision is taken.

To stabilize the national currency exchange rate by gold and foreign currency reserves investing basic goods and services, which need investments, identification is currently the main objective of Ukraine. On the basis of goods (Table 3.7) and services (Table 3.8) export analysis, the main goods and services that are being exported are determined. The criterion for goods and services selection is the exports amount. The analysis was conducted over the past two years (2011-2012).

Table 3.7 Exports of Goods of Ukraine in 2011-2012. (developed by the authors based on [58, p. 46-48])

Product group	Export		
	USD, million		in% 2012, to a total volume of products
	2012	2011	
Ferrous metals	15,340.4	18,466.1	22.29
Crops	6,999.9	3,617.1	10.17
Fats and oils of animal or vegetable origin	4,211.5	3,396.4	6.12
Railway locomotives	4,107.2	3,807.6	5.97
Nuclear reactors, boilers, machinery	3,749.8	3,569.8	5.45

Mineral fuel; oil and products of its distillation	3,639.7	5,691.1	5.29
Ores, slag and ash	3,306.1	3,916.7	4.80
Electrical machinery	3,231.8	3,189.2	4.70
Products made of ferrous metals	2,837.2	2,844.3	4.12
Fertilizers	1,791.3	1,819.6	2.60
Total exports of goods	68,809.8	68,394.2	100.00

Data on exports of goods presented in Table. 3.7, indicate that advanced goods sold abroad in recent years in Ukraine are ferrous metals and crops. Rating of 10 leading product groups in production of which gold and foreign currency reserves funds should be invested, since these goods are in demand on the international markets, is presented in Table 3.7.

Data on exports of services presented in Table. 3.8, indicate that advanced services provided abroad in recent years in Ukraine are pipeline and rail transport.

Rating of 5 leading services provided abroad by Ukraine, in production of which gold and foreign currency reserves funds should be invested, is presented in Table 3.8.

Table 3.8 Exports of Services of Ukraine in 2011-2012. (developed by the authors based on [58, p. 49–52])

Services	**Export**		
	USD, million		in% 2012, to a total volume of services
	2012	2011	
Pipeline transport	3,248.2	3,755.0	23.89
Railway transport	1,586.6	1,776.7	11.67
Air transport	1,510.7	1,501.1	11.11
Maritime transport	1,241.2	1,211.7	9.13
Agricultural services, mining operations, products processing in the field	609.9	627.8	4.48
Total exports of services	13,599.1	13,792.2	100.00

On the basis of the analyzed data on the services provided by Ukraine abroad and the goods exported by the country, an optimization model has been developed. Since accurate determination of risk, profitability and payback data is not possible, conditional data is used to solve the optimization problem. Not the end result, but the model itself is important in the given case, since the model validity can be clearly demonstrated by conditional data.

The optimization model mathematical form: n export industries $K_1, K_2, ..., K_n$ in which not more than Stot of monetary units is invested, each of which can increase exports by $x_1, x_2, ..., x_n$ percent with possible risk $p_1, p_2, ..., p_n$ of interest from the invested amount loss. Accordingly, $s_1, s_2, ..., s_n$ – the amount of invested funds in each industry's exports, the amount of which does not exceed Stot. The amount of funds for investment in every industry must be determined so that the yield was maximum if it is known that not more than $m_1, m_2, ..., m_n$ and not less than $l_1, l_2, ..., l_n$ of monetary units can be invested in every industry and the risk is no more than P funds.

The problem mathematical model has the following form (Formula 3.1):

$$x_1 \cdot s_1 + x_2 \cdot s_2 + ... + x_n \cdot s_n \to \max$$
$$\begin{cases} p_1 \cdot s_1 + p_2 \cdot s_2 + ... + p_n \cdot s_n \le P \\ l_1 \le s_1 \le m_1,\ l_2 \le s_2 \le m_2,\ ..., l_n \le s_n \le m_n \\ s_1 + s_2 + ... + s_n = S_{çàã.} \end{cases}$$

Conditional data was used to solve the problem. The purpose of the problem solving is to prove of gold and foreign currency reserves optimization model effectiveness and to determine the investments amount. We have 15 industries in which not more than USD 357.5 million can be invested, and we cannot risk up to USD 34 million. Data on yields, risks, minimum required investment amount and maximum possible investment amount for each industry is presented in Table 3.9.

Table 3.9 Conditional Data for Optimization Problem No. 1 Calculation (author's development)

Export sector (K)	Indicator			
	the industry yields in%, for the year (x)	risks in% of the invested amount (p)	minimum required investments amount, USD, million (l)	maximum possible investments amount, USD, million (m)
Ferrous metals	22.5	17.21	50	357.7
Crops	22.5	10.17	30	357.7
Fats and oils of animal or vegetable origin	15.2	6.12	15	86
Railway locomotives	18.89	5.97	10	200

Nuclear reactors, boilers, machinery	20.2	5.45	0	50
Mineral fuel; oil and products of its distillation	23.8	5.29	7.9	79
Ores, slag and ash	19.0	4.80	4.5	45
Electrical machinery	17.0	3.80	6.7	67
Products made of ferrous metals	10.5	2.70	2.8	23
Fertilizers	22.5	5.12	0	40
Pipeline transport	21.3	6.30	15	357.7
Railway transport	15.1	5.21	10	100
Air transport	24.9	14.32	6	25
Maritime transport	11.3	9.62	5.6	12
Agricultural services	12.9	2.23	0	10

The problem is designed to determine the amount of funds for investing in each industry so that the increase in exports from the invested funds was maximal.

The problem mathematical model has the following form (Formula 3.2):

$$F(x) = 0{,}205 \cdot x_1 + 0{,}22 \cdot x_2 + 0{,}152 \cdot x_3 + 0{,}1889 \cdot x_4 + 0{,}202 \cdot x_5 + 0{,}238 \cdot x_6 + \\ + 0{,}19 \cdot x_7 + 0{,}17 \cdot x_8 + 0{,}105 \cdot x_9 + 0{,}225 \cdot x_{10} + 0{,}213 \cdot x_{11} + 0{,}151 \cdot x_{12} + \\ + 0{,}249 \cdot x_{13} + 0{,}113 \cdot x_{14} + 0{,}129 \cdot x_{15} \to \max$$

where $x_i -$ are the funds invested in the *i*-th industry.

To solve the problem, restrictions have been introduced (Formula 3.3):

$$
\begin{cases}
0{,}1721\cdot x_1 + 0{,}1017\cdot x_2 + 0{,}0612\cdot x_3 + 0{,}0597\cdot x_4 + 0{,}0545\cdot x_5 + 0{,}0529\cdot x_6 + \\
+ 0{,}048\cdot x_7 + 0.038\cdot x_8 + 0.027\cdot x_9 + 0.0512\cdot x_{10} + 0{,}063\cdot x_{11} + 0{,}0512\cdot x_{12} + \\
+ 0{,}1432\cdot x_{13} + 0{,}0962\cdot x_{14} + 0{,}0223\cdot x_{15} \le 34 \\
x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7 + x_8 + x_9 + x_{10} + x_{11} + x_{12} + x_{13} + x_{14} + x_{15} \le 357{,}7 \\
50 \le x_1 \le 357{,}7 \\
30 \le x_2 \le 357{,}7 \\
15 \le x_3 \le 86 \\
10 \le x_4 \le 200 \\
3 \le x_5 \le 50 \\
7{,}9 \le x_6 \le 79 \\
4{,}5 \le x_7 \le 45 \\
6{,}7 \le x_8 \le 67 \\
2{,}8 \le x_9 \le 23 \\
0 \le x_{10} \le 40 \\
15 \le x_{11} \le 357{,}7 \\
10 \le x_{12} \le 100 \\
6 \le x_{13} \le 25 \\
5{,}6 \le x_{14} \le 12 \\
0 \le x_{15} \le 10
\end{cases}
$$

The solution of the problem using the MathCad software is presented in Appendix F. According to the data of Appendix F, with investment USD 357.7 million in the exported goods and exported services production an annual income amounted to USD 79.214 million. To achieve maximum yield, the amount of funds to be invested in each export industry has been determined by using the MathCad software. The data are presented in Table 3.10.

Table 3.10 The Result of the Optimization Problem Solution When Investing Funds in the Amount of USD 357.7 million (author's development)

Export sector	Funds invested to obtain the maximum increase in exports, USD, million
Ferrous metals	79.867
Crops	61.233
Fats and oils of animal or vegetable origin	15
Railway locomotives	10
Nuclear reactors, boilers, machinery	3
Mineral fuel; oil and products of its distillation	79
Ores, slag and ash	4.5
Electrical machinery	6.7
Products made of ferrous metals	2.8
Fertilizers	40
Pipeline transport	15
Railway transport	10
Air transport	25
Maritime transport	5.6
Agricultural services	0

To achieve gold and foreign currency reserves level increase investment of a larger amount of gold and foreign currency reserves funds is appropriate. When solving the first gold and foreign currency reserves optimization problem investment of revenues from FX reserves operations in 2012 in the amount of USD 357.7 million was proposed. The result of such actions is an increase in FX reserves level by USD 79.214 million. Such an increase has a significant impact on the national currency exchange rate stabilization, since the NBU may optionally use the amount for exchange market interventions.

In the prospects the funds amount in the export sector should be increased for gold and foreign currency reserves level maximum increase. If by the governing bodies of the National Bank of Ukraine decision part of the funds or the total amount of FX reserves deposits will be invested in the national production and services provision sectors, that are exported, then such actions will result in a rapid increase in FX reserves level in 1-2 years. The given model has been considered for the period of one year but the period of its implementation can vary from one to two years. The term depends on the specific industry and investment payback period.

To determine the prospects of gold and foreign currency reserves level increasing in the future, the solution of another FX reserves level optimization

problem with an amount that is 50% of foreign currency and deposits included in FX reserves and FX reserves revenues for the same period is appropriate. Such investments amount will account to USD 3,594.91 million, namely the amount as on 2012 (50% of foreign currency and deposits included in FX reserves – USD 6,474.42 million + USD 357.7 million of the FX revenues). To solve the problem, the conditional data of the maximum possible amount of investments in exports industries should be changed. The data are presented in Table 3.11.

Table 3.11 Conditional Data for Optimization Problem No. 2 Calculation (author's development)

Export sector (K)	Indicator			
	the industry yields in%, for the year (x)	risks in% of the investment (p)	minimum required investments amount, USD, million (l)	maximum possible investments amount, USD, million (m)
Ferrous metals	22.5	17.21	50	2,325
Crops	22.5	10.17	30	1,735
Fats and oils of animal or vegetable origin	15.2	6.12	15	86
Railway locomotives	18.89	5.97	10	200
Nuclear reactors, boilers, machinery	20.2	5.45	0	50
Mineral fuel; oil and products of its distillation	23.8	5.29	7.9	79
Ores, slag and ash	19.0	4.80	4.5	45
Electrical machinery	17.0	3.80	6.7	67
Products made of ferrous metals	10.5	2.70	2.8	23
Fertilizers	22.5	5.12	0	40
Pipeline transport	21.3	6.30	15	1,265
Railway transport	15.1	5.21	10	100
Air transport	24.9	14.32	6	25
Maritime transport	11.3	9.62	5.6	12
Agricultural services	12.9	2.23	0	10

To prove gold and foreign currency reserves optimization model efficiency only the data of maximum possible investments amount in such industries as: ferrous metals, cereals and pipeline transport have been changed. Changes to

the data are necessary, since in optimization problem No.1 they were limited to the maximum possible investment amount. In problem No. 2, the risk amount has been changed, which accounts to no more than USD 357.7 million.

The solution of the problem using the MathCad software is presented in Appendix H. With investment USD 3,594.91 million in the exported goods and exported services production an annual income amounted to USD 800.803 million. To achieve maximum yield, the amount of funds to be invested in each export industry has been determined. The data are presented in Table 3.12.

Table 3.12 The Result of the Optimization Problem Solution When Investing Funds in the Amount of USD 3,594.91 million (author's development)

Export sector	Funds invested to obtain the maximum increase in exports, USD, million
Ferrous metals	584.881
Crops	1,732
Fats and oils of animal or vegetable origin	15
Railway locomotives	10
Nuclear reactors, boilers, machinery	3
Mineral fuel; oil and products of its distillation	79
Ores, slag and ash	4.5
Electrical machinery	6.7
Products made of ferrous metals	2.8
Fertilizers	40
Pipeline transport	1,076
Railway transport	10
Air transport	25
Maritime transport	5.6
Services in the field of agriculture, mining operations, products processing in the field	0

The research has demonstrated that the presented model is efficient in achieving the maximum effect of the national currency exchange rate stabilization due to gold and foreign currency reserves level increase. The model, with its application in 1-2 years, will result in attraction amounts of gold and foreign currency reserves funds that will be invested in the domestic production increase. The results of such actions are:

1) Increase in FX reserves of Ukraine;
2) Increase in exports of Ukraine;
3) Domestic production support;
4) The national currency of Ukraine exchange rate stabilization.

To prove the model stability, exports analysis, which identifies main products that were exported in 2012 and 2013 is presented (Table 3.13). The criterion for goods and services selection is the exports amount.

Table 3.13 Exports of Goods of Ukraine in 2012-2013. (author's development on the basis of [60, p. 48-50])

Product group	Export		
	USD, million		in% 2013, to a total volume of products
	2012	2013	
Ferrous metals	15,340.4	1,7571.1	22.6
Crops	6,999.9	6,371.3	10.1
Fats and oils of animal or vegetable origin	4,211.5	3,507.1	5.5
Railway locomotives	4,107.2	2,463.2	3.9
Nuclear reactors, boilers, machinery	3,749.8	3,840.5	6.1
Mineral fuel; oil and products of its distillation	3,639.7	2,865.4	4.5
Ores, slag and ash	3,306.1	3,917.5	6.2
Electrical machinery	3,231.8	3,134.1	4.9
Products made of ferrous metals	2,837.2	2,590.2	4.1
Fertilizers	1,791.3	1,171.1	1.8
Total exports of goods	68,809.8	63,320.7	100.00

The data presented in Table 3.13 indicate that the main products exported in 2012 did not change in 2013. This indicates that the proposed method of industries selection is stable.

Important issues that affect the optimization model efficiency are this model implementation mechanism development and the investments payback period determination. Gold and foreign currency reserves management mechanism should consist of FX reserves portfolio, which should include: deposits placement, securities purchase and investment in domestic production. Since funds invested in domestic production will not be quickly returned to gold and foreign currency reserves composition, a balanced funds allocation in this portfolio is relevant.

Investments in enterprises involved in products manufacturing and sale and services provision abroad should be performed in accordance with the National Bank decision in three areas:

1) Investment in state enterprises;
2) Investment in major commercial enterprises;
3) Investment in small and medium enterprises group consolidated for an investment project.

In the investments allocation the priority is given to investing in state-owned enterprises, if an investment in a state-owned enterprise is not possible, the National Bank of Ukraine adopts a decision on investing in commercial enterprises by conducting a tender and determining its participants scope. When investing in commercial enterprises or group of commercial enterprises consolidated for an investment project, the National Bank of Ukraine shall appoint a Commission which will include representatives of the Ministries of Ukraine, who will monitor the investment project implementation progress and gold and foreign currency reserves funds payback.

In our opinion, for the model effective application funds should be invested for not longer than 2 years. As the amount of funds invested in domestic production will decrease gold and foreign currency reserves of Ukraine level for a certain period. A schedule of return on investment for 1 year on the example of 20% interest rate per annum has been proposed (Table 3.14).

Table 3.14 Schedule of Return on Investment in Gold and Foreign Currency Reserves Composition for 1 Year Period (author's development)

Period, months	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Return on investments,%	0	0	0	30	50	70	90	100	105	110	115	120

When investing FX reserves funds in the domestic production for 1 year, a refund of the invested funds amount should be performed in 8 months, while 3 months are given for the investment development. Return on investment should increase gold and foreign currency reserves level starting with the 9th month. The presented schedule is relevant, as the funds will be returned not in a year, but after 8 months, with the funds to gold and foreign currency reserves return from the 4th month. The schedule is also relevant for domestic producers, since the funds do not need to be returned in the first 3 months, and the interest charging starts from the 9th month.

A schedule of return on investment for 2 years on the example of 20% interest rate per annum (Table 3.15).

When investing FX reserves funds in the domestic production for 2 years, a refund of the invested funds amount should be performed in 16 months, while 5 months are given for the investment development. Return on investment should increase gold and foreign currency reserves level starting with the 17th month. The presented schedule is relevant, as the funds will be returned not in 2 years, but after 16 months, with the funds to gold and foreign currency reserves return from the 6th month. The schedule is also relevant for domestic

producers, since the funds do not need to be returned in the first 5 months, and the interest charging starts from the 17th month.

Table 3.15 Schedule of Return on Investment in Gold and Foreign Currency Reserves Composition for 2 Years Period (author's development)

Month	Return on investments,%	Month	Return on investments,%
1	0	13	70
2	0	14	80
3	0	15	90
4	0	16	100
5	0	17	105
6	5	18	110
7	10	19	115
8	20	20	120
9	30	21	125
10	40	22	130
11	50	23	135
12	60	24	140

The above data demonstrate that the proposed gold and foreign currency reserves of Ukraine optimization model is relevant and requires further research and consideration of options for its practical application in the economy of Ukraine. On the way of FX reserves development new challenges, that need to be addressed for gold and foreign currency reserves optimization model effective application for the national currency exchange rate stabilization, arise, namely:

– Which industries gold and foreign currency reserves are to be invested;
– What amount of funds can be allocated from gold and foreign currency reserves for the investment activities;
– Investments payback period determination.

A similar scheme of gold and foreign currency reserves application is available in international practice. In Singapore, the Government of Singapore Investment Corporation was created in 1981, which invited David Rothschild, NM Rothschild & Sons, and a number of highly skilled consultants (American and Japanese executives to develop investment in various sectors) to its management. Since 1987 the Government of Singapore Investment Corporation has been able to take Singapore's foreign currency reserves, as well as long-term government assets over its management. In 1997, over 120 billion of Singaporean dollars was under its management. The main objective was not

so much to maximize the return on investment, but to save Singapore's savings cost and provide a sufficient and stable return on investment level [141, p. 81]. Management efficiency is demonstrated by the fact that gold and foreign currency reserves of Singapore amounted to USD 80.7 million in 1997, and by the end of 2013 they amounted to USD 273,065 million [174].

A similar practice is used by other countries while Sovereign Wealth Funds (SWF) creating, the essence of which is the state excess liquid resources accumulation and investments aimed at the national development objectives (including the strategic ones) implementation. According to the IMF classification, the SWF are divided into five types, namely: savings; stabilization; reserves management corporations (to improve the reserve funds investment quality); development funds, which are created to finance key socially significant projects or directed to strategic assets construction in accordance with the state industrial policy; as well as pension funds for unforeseen events that cover the government unforeseen pension liabilities not at the pension fund cost. Often these funds are created through direct financing from the state budget and other revenues which the government considers necessary to include in the Fund. For example, in China the official Central Bank state reserves are managed by such Fund [85, 61–64]. A list of the existing Sovereign Wealth Funds is presented in Table 3.16.

Table 3.16 Sovereign Wealth Funds of the World Countries [85, 61-62]

Country	The Fund's name
UAE – Abu Dhabi	Abu Dhabi Investment Authority
Norway	Government Pension Fund Global
Saudi Arabia	Sama Foreign Holdings
Singapore	Government Investment Corporation
China	Investment Risk Management Corporation
Kuwait	Government Reserve Fund
China	China Investment Corporation
China – Hong Kong	Government Investment Management Agency
Russia	National Welfare Fund
Singapore	Temasek Holdings
Qatar	State Reserve Fund
Australia	Australian Government Future Fund
Libya	Libyan Investment Corporation
Algeria	Reserve Fund/Revenue Regulation Fund
UAE – Dubai	Investment Corporation of Dubai
UAE – Federal	Emirates Investment Authority

USA (AK)	Alaska Permanent Fund
Ireland	National Pensions Reserve Fund
Brunei	Brunei Investment Agency
South Korea	Korea Investment Corporation
Malaysia	Khazanah Nasional Berhad

The model relevance for Ukraine is confirmed by the "Marshall plan". More than forty scientists from around the world appealed to their governments in 2014 to organize a "new Marshall Plan" for Ukraine. The "Marshall plan" is just a "global brand", a generally accepted example of an effective international assistance for the economic recovery. The "Marshall plan" originated from the "Truman doctrine", in the development of this doctrine the American Secretary of State George Marshall called for massive economic assistance in the post-war Europe reconstruction in his speech at Harvard. The "Marshall plan" essence for Ukraine involves financial assistance to increase gold and foreign currency reserves and use these funds for: 40 % to pay the debt, stabilize national currency and invest in non-industrial projects and 60% of the funds should have been invested in industrial development [178].

To implement the model, the following is required:

– Appropriate amendments should be introduced to the legislation of Ukraine regarding gold and foreign currency reserves placement sources, these amendments should be directed to FX reserves application in investment activity admittance;
– The Panel of Experts of the National Bank basis should be created for consolidation the leading experts of Ukraine for discussion and decision-making on gold and foreign currency reserves of Ukraine funds placement;
– Appropriate amendments should be introduced to the legislation of Ukraine regarding investments in state enterprises, large commercial companies and small and medium enterprises groups consolidated for an investment project.
– Appropriate amendments should be introduced to the legislation of Ukraine regarding the withdrawal of the enterprises cash receipts in which gold and foreign currency reserves funds were invested in order to return these funds to gold and foreign currency reserves of Ukraine;
– Appropriate amendments should be introduced to the legislation of Ukraine regarding adoption preventive methods for funds non-repayment in gold and foreign currency reserves of Ukraine composition.

Gold and foreign currency reserves of Ukraine can be increased through the funds placement sources. The national currency of Ukraine exchange rate stabilization can be achieved through finished products and services exports increase. Such increases can be achieved by investing gold and foreign currency reserves of Ukraine funds in manufacturing products that are exported. For the most effective result of the national currency exchange rate stabilization the FX reserves amount that can be used, and industries that need the funds should be clearly determined. For maximum effect of exports increase a large amount of FX reserves should be attracted. The National Bank of Ukraine primary objective is the FX reserves amount increase.

The presented optimization model for gold and foreign currency reserves funds investment in production of goods and services that are exported is relevant, since due to its application, the total FX reserves level increases and the negative balance of export-import relations decreases. The impact on the exchange rate with the model application is positive, since gold and foreign currency reserves level is increasing, at the expense of which the National Bank of Ukraine will perform exchange market interventions; and the support of the national currency will be increased through the sale of finished goods and provision of services abroad. The confirmation of the model relevance is the world practice in which the leading world countries accumulate their gold and foreign currency reserves in Sovereign Wealth Funds, the purpose of which is to increase these funds through their investment in production.

Conclusions on Section 3

1. The issue of full disclosure of information on gold and foreign currency reserves of Ukraine composition and structure, as well as information on reserve foreign currencies included in their composition structure and amount, remains relevant. The Monograph presents a program for the disclosure of information on gold and foreign currency reserves of Ukraine real status, aimed at the full disclosure of information on FX reserves. The program objective is the increase of public confidence through the information for citizens of Ukraine provision, as well as effective analysis by the state governing bodies to identify effective actions that will be aimed at the national currency exchange rate stabilization.
2. The comparative analysis of gold and foreign currency reserves of Ukraine and the leading world countries structure has made determination of two areas of FX reserves of Ukraine development possible, namely: the first area is aimed at increasing foreign currency and deposits share in gold and foreign currency reserves composition; the second area requires development of models for foreign currency and deposits included in gold and foreign currency reserves of Ukraine effective management by the leadership of the country and the National Bank of Ukraine. The countries credit rating analysis according to the Moody's, Standard & Poor's and Fitch rating agencies, and gold and foreign currency reserves amount of the countries with the highest credit rating determination has provided an opportunity to identify the countries which issued securities should be held in gold and foreign currency reserves of Ukraine composition. These countries include: Switzerland, Singapore, Germany, the USA and the UK.
3. For gold and foreign currency reserves level increase their management efficiency improvement is relevant. Such changes can be achieved by the existing management system improvement. A prospective area is the Department for Gold and Foreign Currency Reserves Management of the National Bank of Ukraine performance improvement. The Department, through each of its members' rights and responsibilities of clear distribution, will contribute to FX reserves of Ukraine effective management. The included in the Department Expert Division will contribute to the investment problems solution. The model application should be aimed at achieving qualitative, quantitative and organizational improvements related to gold and foreign currency reserves management. The result of

these improvements is the increase in gold and foreign currency reserves of Ukraine level, and the national currency exchange rate, as well as the economy of Ukraine as a whole stabilization.

4. At the current stage of gold and foreign currency reserves of Ukraine development, an increase in their level through the formation sources is impossible to be achieved. The increase in FX reserves level can be achieved through their effective management. One of the main areas of the FX reserves status improvement is funds included in their composition investment into the domestic production, namely, production of goods and provision of services that are exported. The appropriateness of such investments is due to the fact that finished products and services export can be increased at the FX reserves cost. The result of such changes is the national currency exchange rate stabilization in two areas: firstly, due to FX reserves level increase, and secondly, due to the negative balance of export-import relations decrease.
5. The proposed optimization model will assist in solving issues related to gold and foreign currency reserves level and export volumes increase. The result of such changes is domestic producers and the country economy as a whole support, as well as the national currency of Ukraine exchange rate stabilization. The confirmation of the model relevance is the world practice which demonstrates that the leading world countries accumulate their gold and foreign currency reserves in Sovereign Wealth Funds, the purpose of which is to increase these funds through their investment in production.

The main provisions of Section 3 are reflected in the following works of the authors: [31].

CONCLUSIONS

Important scientific and practical problems of theoretical-scientific and methodological provisions regarding the state management of gold and foreign currency reserves as a tool for the national currency exchange rate stabilization, substantiating and improvement have been solved in the Monograph, as well as practical recommendations for the problems of the national currency exchange rate regulation solution has been developed. The main results of the study are:

1. State regulation of gold and foreign currency reserves means the government administration process as an institutionally organized system of measures that the state applies in their management process, but not as a separate function (prerogative) of the National Bank of Ukraine. An important step towards the national currency exchange rate stabilization for the Ukrainian economy is a fixed exchange rate regime choice, since for an emerging economy, the basic role in economic development ensuring is played by the fiscal policy. Sufficient level of gold and foreign currency reserves availability, which are used to regulate the national currency exchange rate, is important for the exchange rate stabilization.
2. It has been determined that the exchange rate is the ratio between monetary units of the two countries used to exchange currencies when foreign exchange and other economic transactions conducting. Classification of the main factors that affect the exchange rate has been clarified in the Monograph and it has been identified that the classification by the effective terms is the most common and efficient. Each factor impact on the national currency exchange rate have been determined in the course of the research.
3. State regulation of the national currency exchange rate has been determined as a set of tools by which the exchange rate is set by the government. It includes formal and informal instructions and auxiliary rules set by the state in the course of the national currency exchange rate regulating. The analysis of the state tools for the national currency of Ukraine exchange rate

regulation has revealed that the main tool for the exchange rate formation is gold and foreign currency reserves that are used for exchange market interventions. Through the exchange market interventions instrumentality, the National Bank of Ukraine influences the exchange rate, thereby pursuing the monetary unit of Ukraine stabilization process.

4. The important objective of the Government and the National Bank of Ukraine is gold and foreign currency reserves efficient management, namely their formation and management processes optimization. The lack of sufficiently detailed regulation of the relevant institutions and officials' rights and responsibilities regarding FX reserves management is a problematic issue in gold and foreign currency reserves management. Gold and foreign currency reserves level improvement can be achieved by creating new, or improving the existing state institutional management structure. One of the most important objectives of gold and foreign currency reserves of Ukraine application is their placement. Effective strategy of gold and foreign currency reserves management lack results in their decline and inability to perform basic functions, namely accumulation of sufficient funds for exchange market interventions aimed at the national currency of Ukraine exchange rate stabilization.
5. The conducted research of gold and foreign currency reserves of Ukraine current status has revealed gold and foreign currency reserves insufficiency for the successful exchange market interventions, through which the national currency exchange rate in Ukraine is stabilized. A close interrelation between the national currency exchange rate and exchange market interventions of the National Bank of Ukraine is observed. One of the reasons for the national currency sharp fluctuations is gold and foreign currency reserves significant insufficiency to succeed in exchange market interventions, and at the cost of which the national currency exchange rate stabilization can be achieved in Ukraine. The fact that to achieve the national currency of Ukraine exchange rate stabilization the country gold and foreign currency reserves level should be increased has been proved.
6. The analysis of gold and foreign currency reserves of Ukraine formation process has made the portfolio structure of FX reserves formation sources identification possible, namely: internal formation sources include the National Bank of Ukraine profits distribution, the consolidated balance of payments funds allocation and funds emission; attracted funds include monetary gold purchase, foreign currency purchase, bonds of domestic and foreign government loans issuance and borrowings in Ukraine and abroad.

The analysis has revealed that among gold and foreign currency reserves of Ukraine formation sources none of the sources is of a decisive influence on their increase.

7. While investigating the state management of gold and currency reserves processes, their management tools in Ukraine have been identified. These include the following tools: placement – securities purchase, transactions with monetary gold and investment deposits; application – foreign currency purchase and sale, the consolidated balance of payments deficit financing and the public debt payment (payments on the IMF loans, repayment on the government-guaranteed debt, external public debt repayment and servicing). In portfolio structure of the FX reserves management tools, the placement tools are the most relevant. The increase in FX reserves can be achieved through the efficient deposits placement, however, their management low yield is a problematic issue. The problem with the lack of transparency (transparent information for the society) on FX reserves management has been identified in the Monograph. Information regarding gold and foreign currency reserves of the Ukrainian state formation, placement terms, composition, actual application and return to the country terms is completely confidential.
8. Diversified areas of gold and foreign currency reserves growth have been determined based on the comparative analysis of gold and foreign currency reserves of Ukraine and the leading world countries structures results. The first area involves increasing foreign currencies and deposits share in gold and foreign currency reserves composition. The second one demands foreign currency and deposits, included in gold and foreign currency reserves of Ukraine, management improvement. According to the analysis of credit risk and gold and foreign currency reserves of the world countries level, it has been determined that gold and foreign currency reserves custody in the form of securities, such as debentures and government securities issued by Switzerland, Singapore, Germany, the USA and the Great Britain is prospective for gold and foreign currency reserves of Ukraine development.
9. Organizational structure of the Department for Gold and Foreign Currency Reserves Management improvement for efficiency of gold and foreign currency reserves of Ukraine management improvement has been proposed. Through the changes in the Department layout and the Department functions and responsibilities subsequent modification, efficiency of gold and foreign currency reserves management improvement, as well as their

increase in the future can be achieved. The FX reserves Panel of Experts should become the main component of the Department for Gold and Foreign Currency Reserves Management. The FX reserves Panel of Experts is the involvement leading experts of Ukraine by the Expert Division in discussion and decision-making on gold and foreign currency reserves of Ukraine funds placement. To increase gold and foreign currency reserves level and stabilize the national currency exchange rate, the Department for Gold and Foreign Currency Reserves Management activities should be aimed at qualitative, quantitative and organizational changes. Information on gold and foreign currency reserves in Ukraine real status is proposed to be disclosed, which will increase the population confidence in the national currency. Information on gold and foreign currency reserves of Ukraine composition and structure; reserve currencies included in FX reserves structure and amount; securities included in FX reserves; international placed deposits included in FX reserves; international loans obtained by the National Bank of Ukraine from the International Monetary Fund and foreign countries should be disclosed.

10. Practical recommendations for gold and foreign currency reserves of Ukraine funds investment in domestic production of goods and provision of services which are exported have been developed. The fact that investing in domestic production will contribute to: firstly, the economy development and crisis phenomena in the country overcoming; secondly, FX reserves increase due to the sale of the finished products; thirdly, exports in the country improvement, as well as positive balance of export-import relations achievement has been justified. An optimization model for gold and foreign currency reserves of Ukraine investing has been developed, and a decision-making scheme for solving problems related to the investment of funds has been presented.
11. The research carried out in the Monograph confirms the current relevance of the chosen problem. The proposed methods of gold and foreign currency reserves increasing to stabilize the national currency exchange rate are relevant. The developed optimization model for gold and foreign currency reserves application is efficient for the Ukrainian economy. The relevance of the problem is enhanced by conclusions of the leading scientists from around the world calling for the new "Marshall Plan" for Ukraine implementation, the essence of which is closely interrelated with the researches carried out in the Monograph and the proposed model for gold and foreign currency reserves increase for the national currency of Ukraine exchange rate and the country economy as a whole stabilization.

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Appendices

Appendix A

Table A. 1 Scientists Approaches to the Exchange Rate Concept Definition

Scientist (group of scientists)	Exchange rate definition
Savluk M. I. Moroz A. M. Puhovkina M. F.	1. The ratio at which one currency is exchanged for another, or a "price" of monetary unit of one country, which is determined in another country currency. 2. The value of the monetary unit of one country expressed in monetary units of another country, group of countries or in the international settlement units
Adamic B.P. Borinets S.Ya.	The price of a monetary unit of one country expressed in monetary units of another countries
Ash S. M.	The exchange value of the national currency of one country expressed in monetary units of another country
Maslova S. O. Opalov O. A.	The ratio between monetary units of the two countries used to exchange currencies when foreign exchange and other economic transactions conducting.
Kovalenko D.I Ivasiv B. S. Schetinin A. I.	The value of one country currency expressed in monetary units of another country or in the international payment means
Jarish O. V. Gnipa-Chernivetska L. B.	The ratio between monetary units of the two countries used to exchange currencies when foreign exchange and other economic transactions conducting
Zagorskiy V. C. Vovtcak O. Д. Blagun I. G. Chuy I. P.	One currency price expressed in another
Lubun O. S.	The price of a unit of foreign currency expressed in national currency units

Appendix B

Table B. 1 Exchange Rates Classification [53, p. 8-9]

No.	Exchange Rate Type	Characteristics
1	Official	Exchange rate set by the government (often by the Central Bank)
2	Nominal	exchange rate operating (operated) on the foreign exchange market for a certain period
3	Real	Nominal exchange rate with the inflation rate accounting
4	Nominal effective	The national currency exchange rate is defined as the average value of the main trading partners currencies values
5	Real effective	The exchange rate index is calculated as an arithmetic weighted average value based on the trading partners currencies basket and their share in the total volume of goods turnover taking into account the domestic prices of the country and its main foreign economic partners dynamics for the relevant period
6	Current (spot rate)	The rate that is valid at the current point of time (settlement of transactions on currency purchase at the spot exchange rate is effected on the second working (banking) day after the transaction)
7	Forward („outright")	The rate at which the currency of one country is sold or purchased for another country currency at a certain date in the future
8	Cross-rate	The ratio between two currencies which is determined based on the exchange rate of these currencies against a third currency
9	Bid quotation	The price (rate) at which a market participant (bank) purchases foreign currency
10	Offered rate	The price (rate) at which a market participant (bank) sells foreign currency
11	Actual market	Rate, calculated as the arithmetic mean of the buyer and the seller rates
12	Expected	The exchange rate on a specified date in the future, predicted by the majority of market participants
13	Equilibrium	The rate at which foreign exchange demand and supply are balanced

Continuation of Table B. 1

No.	Exchange Rate Type	Characteristics
14	Central	The official correlation between currencies around wchich market exchange rates fluctuate within the agreed limits
15	Guaranteed	The rate fixed at the agreement conclusion
16	Final	The exchange rate at the balance sheet compiling (balance closing rate)
17	Temporary	The exchange rate at the transaction moment, which is one of the variants of currency translation
18	Floating	The exchange rate which level is determined on the foreign exchange market and influenced by supply and demand
19	Mandatory (fixed)	The official fixed rate, which is introduced by the state bodies (Central Banks) in terms of currency exchange restrictions on the national currency for the foreign currency
20	Controlled	The exchange rate, which when fixed on the foreign exchange market is regulated by the Central Bank of the country
21	Cash	The rate at which a foreign exchange market participant (exchange office) purchases or sells foreign currency cash

Appendix C

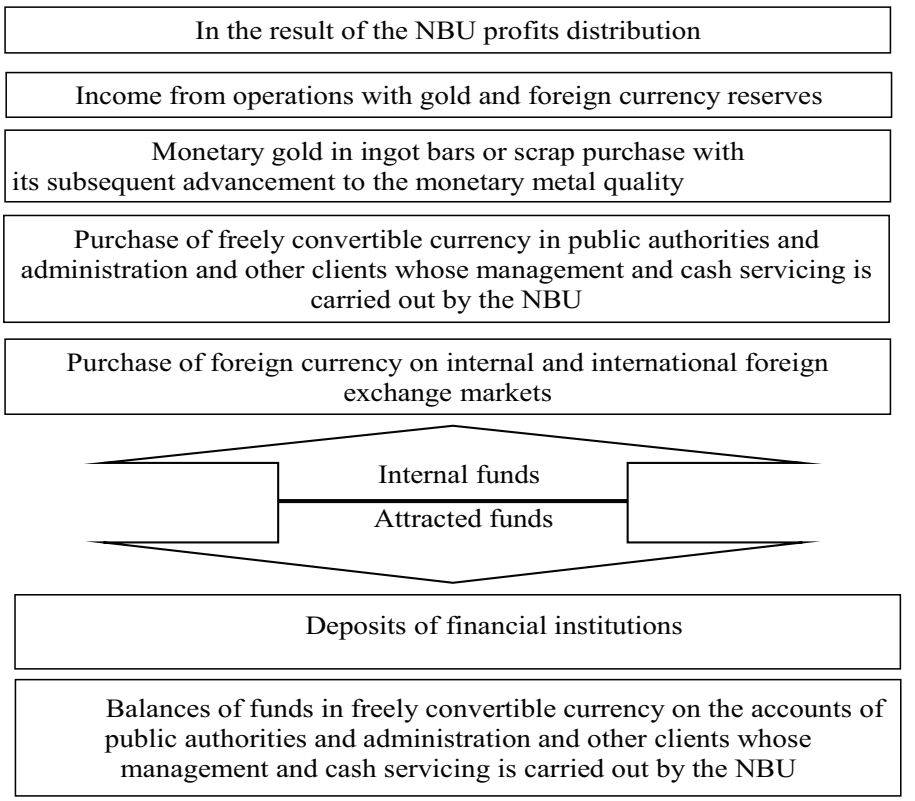

Fig. C. 7. Sources of Official Foreign Currency Reserves Formation Funded through Domestic and Attracted Funds (author's development on the basis of [138])

Appendix D

Table E. 1 Foreign Currency Reserves Dynamics in 2004-2013 (author's development on the basis of [114])

Period / Reserves in foreign currency (USD, million)	As on 31.12.									As on31.10
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
1. Securities	733.32	3,945.61	8,527.80	15,309.81	16,475.49	13,926.85	19,026.99	18,675.00	16,172.20	15,761.98
2. Total foreign currency and deposits:	8,756.19	15,041.42	13,315.36	16,473.36	14,316.36	11,566.48	14,292.45	11,716.38	6,474.42	3,029.94
a) in other Central Banks, the Bank for International Settlements and the IMF	4,698.88	5,260.60	1,128.17	18.70	2,404.98	2,008.51	1,206.64	1,016.07	1,831.15	435.94
b) in banks headquartered outside the reporting country	4,057.31	9,780.82	12,187.19	16,454.66	11,911.38	9,557.97	13,085.81	10,700.31	4,643.27	2,594.00
Total	9,489.51	18,987.03	21,843.16	31,783.17	30,791.85	25,493.33	33,319.44	30,391.38	22,646.62	18,791.92
Period / Reserves in foreign currency (USD, million)	Rate of change, percent-denominated									
	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011	2011– 2012	2012–2013
1. Securities	-	538.05	216.13	179.53	107.61	84.53	136.62	98.15	86.60	97.46
2. Total foreign currency and deposits:	-	171.78	88.52	123.72	86.91	80.79	123.57	81.98	55.26	46.80
a) in other Central Banks, the Bank for International Settlements and the IMF	-	111.95	21.45	1.66	12,860.86	83.51	60.08	84.21	180.22	23.81
b) in banks headquartered outside the reporting country	-	241.07	124.60	135.02	72.39	80.24	136.91	81.77	43.39	55.87
Total	-	200.08	115.04	145.51	96.88	82.79	130.70	91.21	74.52	82.98

Reserves in foreign currency (USD, million) \ Period	Absolute variation (USD, million)									
	2003–2004	2004–2005	2005–2006	2006–2007	2007–2008	2008–2009	2009–2010	2010–2011	2011–2012	2012–2013
1. Securities	-	3212.29	4,582.19	6,782.01	1,165.68	-2,548.64	5,100.14	-351.99	-2,502.80	-410.22
2. Total foreign currency and deposits:	-	6,285.23	-1,726.06	3,158.00	-2,157.00	-2,749.88	2,725.97	-2,576.07	-5,241.96	-3,444.48
a) in other Central Banks, the Bank for International Settlements and the IMF	-	561.72	-4,132.43	-1,109.47	2,386.28	-396.47	-801.87	-190.57	815.08	-1,395.21
b) in banks headquartered outside the reporting country	-	5,723.51	2,406.37	4,267.47	-4,543.28	-2,353.41	3,527.84	-2,385.50	-6,057.04	-2,049.27
Total	-	9,497.52	2,856.13	9,940.01	-991.32	-5,298.52	7,826.11	-2,928.06	-7,744.76	-3,854.70

Appendix F

Table F. 1 Credit Rating of the World Countries According to Moody's, Standard & Poor's and Fitch Rating Agencies as on the end of 2013, [78]

Country	Standard & Poor's		Moody's		Fitch	
	rating	estimation	rating	estimation	rating	estimation
Andorra	A-	NEG				
Albania	B	NEG	B1			
Armenia			Ba2	STA	BB-	STA
Angola	BB-	STA	Ba3	POS	BB-	POS
Argentina	B-	NEG	B3	NEG	CC	NEG
Austria	AA+	STA	Aaa	NEG	AAA	STA
Australia	AAA	STA	Aaa	STA	AAA	STA
Aruba	A-	NEG			BBB	STA
Azerbaijan	BBB-	STA	Baa3	STA	BBB-	STA
Bosnia and Herzegovina	B	STA	B3	STA		
Barbados	BB+	STA	Ba1	NEG		
Bangladesh	BB-	STA	Ba3	STA		
Belgium	AA	NEG	Aa3	NEG	AA	STA
Burkina Faso	B	STA				
Bulgaria	BBB	STA	Baa2	STA	BBB-	STA
Bahrain	BBB	STA	Baal	NEG	BBB	STA
Benin	B	NEG				
Bermuda	AA-	STA	Aa2	STA	AA	STA
Brazil	BBB	STA	Baa2	STA	BBB	STA
Bahamas	BBB	NEG	Baal	NEG		
Bolivia	BB-	STA	Ba3	STA	BB-	STA
Botswana	A-	STA	A2	STA		
Belarus	B-	STA	B3	NEG		
Belize	SD	NM	Ca	NEG		
Canada	AAA	STA	Aaa	STA	AAA	STA
Cook Islands	B+	STA				
Chile	AA-	STA	Aa3	STA	A+	STA
Cameroon	B	STA			B	STA
China	AA-	STA	Aa3	POS	A+	STA
Colombia	BBB-	POS	Baa3	STA	BBB-	STA
Costa Rica	BB	STA	Baa3	STA	BB+	STA

Cuba			Caa1	STA		
Cape Verde	B+	STA			B+	STA
Cyprus	B-	NEG	Caa3	NEG	B-	NEG
Cayman Islands			Aa3	STA		
Croatia	BB+	STA	Ba1	STA	BB+	STA
Czech Republic	AA-	STA	A1	STA	A+	STA
Denmark	AAA	STA	Aaa	STA	AAA	STA
Dominican Republic	B+	STA	B1	STA	B	STA
Ecuador	B	STA	Caa1	STA	B-	POS
Estonia	AA-	STA	A1	STA	A+	STA
Egypt	B-	NEG	Caa1	NEG	B-	NEG
Finland	AAA	STA	Aaa	STA	AAA	STA
FIJI	B	STA	B1	STA		
France	AA+	NEG	Aa1	NEG	AA+	STA
Gabon	BB-	NEG			BB-	POS
Grenada	CCC+	NEG				
Georgia	BB-	STA	Ba3	STA	BB-	STA
Germany	AAA	STA	Aaa	NEG	AAA	STA
Ghana	B	STA	B1	STA	B+	NEG
Greece	B-	STA	Caa3	STA	B-	STA
Guatemala	BB	STA	Ba1	STA	BB+	STA
Hong Kong	AAA	STA	Aa1	STA	AA+	STA
Honduras	B	STA	B2	NEG		
Hungary	BB	STA	Ba1	NEG	BB+	STA
Indonesia	BB+	POS	Baa3	STA	BBB-	STA
Ireland	BBB+	STA	Ba1	STA	BBB+	STA
Israel	A+	STA	A1	STA	A	POS
Isle Of Man	AA+	STA	Aaa	STA		
India	BBB-	NEG	Baa3	STA	BBB-	STA
Iceland	BBB-	STA	Baa3	STA	BBB	STA
Italy	BBB	NEG	Baa2	NEG	BBB+	NEG
Jordan	BB	NEG	Ba2	NEG		
Japan	AA-	NEG	Aa3	STA	A+	NEG
Kenya	B+	STA	B1	STA	B+	STA
Cambodia	B	STA	B2	STA		
Korea	A+	STA	Aa3	STA		
Kuwait	AA	STA	Aa2	STA	AA	STA
Kazakhstan	BBB+	STA	Baa2	POS	BBB+	STA
Lebanon	B	NEG	B1	STA	B	STA
Liechtenstein	AAA	STA				
Lithuania	BBB	STA	Baal	STA	BBB	STA

Luxembourg	AAA	STA	Aaa	NEG	AAA	STA
Latvia	BBB+	POS	Baa3	POS	BBB	STA
Libya						
Morocco	BBB-	NEG	Ba1	NEG	BBB-	STA
Moldova			B3	STA		
Montenegro	BB-	STA	Ba3	STA		
Macedonia	BB	STA			BB+	STA
Mongolia	BB-	STA	B1	STA	B+	STA
Macau			Aa3	STA		
Montserrat	BBB-	STA				
Malta	BBB+	STA	A3	NEG	A+	STA
Mauritius			Baal	STA		
Mexico	BBB+	STA	Baal	STA	BBB+	STA
Malaysia	A-	STA	A3	POS	A-	NEG
Mozambique	B+	STA			B	POS
Namibia			Baa3	STA		
Nigeria	BB-	STA	Ba3	STA	BB-	STA
Nicaragua			B3	STA		
Netherlands	AA+	NEG	Aaa	NEG	AAA	NEG
Norway	AAA	STA	Aaa	STA	AAA	STA
New Zealand	AA+	STA	Aaa	STA	AA	STA
Oman	A	STA	A1	STA		
Panama	BBB	STA	Baa2	STA	BBB	STA
Peru	BBB	POS	Baa2	POS	BBB	STA
Papua New Guinea	B+	STA	B1	STA		
Philippines	BBB-	STA	Baa3	POS	BBB-	STA
Pakistan	B-	STA	Caa1	NEG		
Poland	A	STA	A2	STA	A-	POS
Portugal	BB	NEG	Ba3	STA	BB+	NEG
Paraguay	BB-	STA	Ba3	STA	BB-	STA
Qatar	AA	STA	Aa2	STA		
Russia	BBB	STA	Baal	STA	BBB	STA
Romania	BB+	STA	Baa3	NEG	BBB-	STA
Rwanda	B	STA			B	STA
Serbia	BB-	NEG			BB-	NEG
Saudi Arabia	AA-	STA	Aa3	STA	AA-	POS
Seychelles					B	POS
Senegal	B+	NEG	B1	STA		
Sweden	AAA	STA	Aaa	STA	AAA	STA
Switzerland	AAA	STA	Aaa	STA	AAA	STA
Singapore	AAA	STA	Aaa	STA	AAA	STA

Slovenia	A-	STA	Ba1	NEG	BBB+	NEG
Slovakia	A	STA	A2	STA	A+	STA
Spain	BBB-	NEG	Baa3	STA	BBB	STA
Sri Lanka	B+	STA	B1	STA	BB-	STA
Suriname	BB-	STA	Ba3	POS	BB-	STA
Salvador	BB-	NEG	Ba3	STA	BB	NEG
Saint - Martin			Baal	STA		
Taiwan	AA-	STA	Aa3	STA	A+	STA
Thailand	BBB+	STA	Baal	STA	BBB+	STA
Tunisia	BB-	NEG	Baa3	NEG	BB+	NEG
Trinidad and Tobago	A	STA	Baal	STA		
Turkey	BB+	STA	Baa3	STA	BBB-	STA
Ukraine	B-	NEG	Caa1	NEG	B-	NEG
Uganda	B+	NEG			B	POS
United States Of America	AA+	NEG	Aaa	STA	AAA	NEG
UK	AAA	NEG	Aa1	STA	AA+	STA
United Arab Emirates			Aa2	STA	AA	STA
Uruguay	BBB-	STA	Baa3	POS	BB+	POS
Saint Vincent and the Grenadines			B2	STA		
Vietnam	BB-	STA	B2	STA	B+	STA
Venezuela	B+	STA	B2	NEG	B+	NEG
RSA	BBB	NEG	Baal	NEG	BBB	STA
Zambia	B+	STA	B1	STA	B+	NEG

Estimation: STA – stable, NEG – negative, POS – positive

Appendix G
Gold and Foreign Currency Reserves of the World Countries

Table G. 1 Gold and Foreign Currency Reserves of Austria (USD, million) [189]

December 2013	
A. Official reserve assets	23,297.14
(1) Foreign currency reserves (in convertible foreign currencies)	8,085.66
(a) Securities	7,215.45
of which: issuer headquartered in reporting country but located abroad	
(b) total currency and deposits with:	770.21
(i) other national central banks, BIS and IMF	339.26
(ii) banks headquartered in the reporting country	
of which: located abroad	
(iii) banks headquartered outside the reporting country	530.95
of which: located in the reporting country	
(2) IMF reserve position	1,591.48
(3) SDRs	2,745.79
(4) gold (including gold deposits and, if appropriate, gold swapped)£	10,816.28
-volume in millions of fine troy ounces	99.00
(5) other reserve assets (specify)	56.54
-financial derivatives	56.54
-loans to nonbank nonresidents	
-other	
B. Other foreign currency assets (specify)	984.68
-securities not included in official reserve assets	965.37
-deposits not included in official reserve assets	
-loans not included in official reserve assets	
-financial derivatives not included in official reserve assets	19.31
-gold not included in official reserve assets	
-other	

Table 3.2 Gold and Foreign Currency Reserves of Australia (USD, million) [189]

December 2013	
A. Official reserve assets	52,733.07
(1) Foreign currency reserves (in convertible foreign currencies)	42,105.54
(a) Securities	36,264.94
of which: issuer headquartered in reporting country but located abroad	
(b) total currency and deposits with:	5,840.61
(i) other national central banks, BIS and IMF	1,621.81
(ii) banks headquartered in the reporting country	
of which: located abroad	
(iii) banks headquartered outside the reporting country	4,218.80
of which: located in the reporting country	
(2) IMF reserve position	2,404.02
(3) SDRs	4,740.30
(4) gold (including gold deposits and, if appropriate, gold swapped)£	3,056.10
-volume in millions of fine troy ounces	2.57
(5) other reserve assets (specify)	427.11
-financial derivatives	0.11
-loans to nonbank nonresidents	
-other	427.00
B. Other foreign currency assets (specify)	106.86
-securities not included in official reserve assets	0.00
-deposits not included in official reserve assets	
-loans not included in official reserve assets	0.00
-financial derivatives not included in official reserve assets	106.86
-gold not included in official reserve assets	
-other	

Table 3.3 Gold and Foreign Currency Reserves of Canada (USD, million) [189]

December 2013	
A. Official reserve assets	71,937.00
(1) Foreign currency reserves (in convertible foreign currencies)	58,430.00
(a) Securities	57,457.00
of which: issuer headquartered in reporting country but located abroad	
(b) total currency and deposits with:	973.00
(i) other national central banks, BIS and IMF	973.00
(ii) banks headquartered in the reporting country	0.00
of which: located abroad	
(iii) banks headquartered outside the reporting country	0.00
of which: located in the reporting country	
(2) IMF reserve position	4,717.00
(3) SDRs	8,675.00
(4) gold (including gold deposits and, if appropriate, gold swapped)£	115.00
-volume in millions of fine troy ounces	0.10
(5) other reserve assets (specify)	
-financial derivatives	
-loans to nonbank nonresidents	
-other	
B. Other foreign currency assets (specify)	
-securities not included in official reserve assets	
-deposits not included in official reserve assets	
-loans not included in official reserve assets	
-financial derivatives not included in official reserve assets	
-gold not included in official reserve assets	
-other	

Table 3.4 Gold and Foreign Currency Reserves of Finland (USD, million) [189]

November 2013	
A. Official reserve assets	10,923.03
(1) Foreign currency reserves (in convertible foreign currencies)	6,304.47
(a) Securities	5,770.14
of which: issuer headquartered in reporting country but located abroad	51.66
(b) total currency and deposits with:	532.96
(i) other national central banks, BIS and IMF	96.53
(ii) banks headquartered in the reporting country	16.32
of which: located abroad	16.32
(iii) banks headquartered outside the reporting country	418.76
of which: located in the reporting country	0.00
(2) IMF reserve position	928.61
(3) SDRs	1,726.69
(4) gold (including gold deposits and, if appropriate, gold swapped)£	1,960.54
-volume in millions of fine troy ounces	1.58
(5) other reserve assets (specify)	2.72
-financial derivatives	2.72
-loans to nonbank nonresidents	0.00
-other	0.00
B. Other foreign currency assets (specify)	-13.60
-securities not included in official reserve assets	273.28
-deposits not included in official reserve assets	0.00
-loans not included in official reserve assets	0.00
-financial derivatives not included in official reserve assets	-288.24
-gold not included in official reserve assets	0.00
-other	0.00

Table 3.5 Gold and Foreign Currency Reserves of Germany (USD, million) [189]

December 2013	
A. Official reserve assets	193,249.76
(1) Foreign currency reserves (in convertible foreign currencies)	33,725.13
(a) Securities	33,453.35
of which: issuer headquartered in reporting country but located abroad	0.00
(b) total currency and deposits with:	5,265.40
(i) other national central banks, BIS and IMF	3,537.04
(ii) banks headquartered in the reporting country	0.00
of which: located abroad	0.00
(iii) banks headquartered outside the reporting country	1,678.36
of which: located in the reporting country	0.00
(2) IMF reserve position	10,979.02
(3) SDRs	17,703.51
(4) gold (including gold deposits and, if appropriate, gold swapped)	130,843.49
—volume in millions of fine troy ounces	108.90
(5) other reserve assets (specify)	0.00
—financial derivatives	0.00
—loans to nonbank nonresidents	0.00
—other	0.00
B. Other foreign currency assets (specify)	172.39
—securities not included in official reserve assets	0.00
—deposits not included in official reserve assets	172.39
—loans not included in official reserve assets	0.00
—financial derivatives not included in official reserve assets	0.00
—gold not included in official reserve assets	0.00
—other	0.00

Table 3.6 Gold and Foreign Currency Reserves of Norway (USD, million) [189]

November 2013	
A. Official reserve assets	59,842.00
(1) Foreign currency reserves {in convertible foreign currencies)	51,199.00
(a) Securities	50,505.00
of which: issuer headquartered in reporting country but located abroad	
(b) total currency and deposits with:	694.00
(i) other national central banks. BIS and IMF	673.00
{ii) banks headquartered in the reporting country	
of which: located abroad	
(iii) banks headquartered outside the reporting country	21.00
of which: located in the reporting country	
(2) IMF reserve position	1,410.00
(3) SDRs	2,284.00
{4) gold {including gold deposits and. if appropriate, gold swapped)^	0.00
-volume in millions of fine troy ounces	
(5) other reserve assets (specify)	4,949.00
-financial derivatives	-2.00
-loans to nonbank nonresidents	
-other	4,951.00
B. Other foreign currency assets (specify)	891.00
-securities not included in official reserve assets	
-deposits not included in official reserve assets	6.00
-loans not included in official reserve assets	632.00
-financial derivatives not included in official reserve assets	1.00
-gold not included in official reserve assets	
-other	252.00

Table 3.7 Gold and Foreign Currency Reserves of Sweden (USD, million) [189]

December 2013	
A. Official reserve assets	65,379.00
(1) Foreign currency reserves {in convertible foreign currencies)	55,376.00
(a) Securities	52,295.00
of which: issuer headquartered in reporting country but located abroad	0.00
(b) total currency and deposits with:	3,081.00
(i) other national central banks. BIS and IMF	2,922.00
{ii) banks headquartered in the reporting country	0.00
of which: located abroad	0.00
(iii) banks headquartered outside the reporting country	159.00
of which: located in the reporting country	0.00
(2) IMF reserve position	1,794.00
(3) SDRs	3,321.00
{4) gold {including gold deposits and. if appropriate, gold swapped)^	4,888.00
-volume in millions of fine troy ounces	4.04
(5) other reserve assets (specify)	0.00
-financial derivatives	0.00
-loans to nonbank nonresidents	0.00
-other	0.00
B. Other foreign currency assets (specify)	57.00
-securities not included in official reserve assets	0.00
-deposits not included in official reserve assets	0.00
-loans not included in official reserve assets	57.00
-financial derivatives not included in official reserve assets	0.00
-gold not included in official reserve assets	0.00
-other	0.00

Table 3.8 Gold and Foreign Currency Reserves of Switzerland (USD, million) [189]

December 2013	
A. Official reserve assets	535,882.90
(1) Foreign currency reserves {in convertible foreign currencies)	488,554.78
{a) Securities	411,703.75
of which: issuer headquartered in reporting country but located abroad	197.81
(b) total currency and deposits with:	76,851.04
(i) other national central banks. BIS and IMF	76,628.96
{ii) banks headquartered in the reporting country	6.19
of which: located abroad	0.00
(iii) banks headquartered outside the reporting country	215.88
of which: located in the reporting country	33.77
(2) IMF reserve position	2,576.77
(3) SDRs	4,820.27
{4) gold {including gold deposits and. if appropriate, gold swapped)^	39,924.74
-volume in millions of fine troy ounces	33.44
(5) other reserve assets (specify)	6.34
-financial derivatives	6.34
-loans to nonbank nonresidents	0.00
-other	0.00
B. Other foreign currency assets (specify)	395.87
-securities not included in official reserve assets	0.00
-deposits not included in official reserve assets	113.06
-loans not included in official reserve assets	274.17
-financial derivatives not included in official reserve assets	8.64
-gold not included in official reserve assets	0.00
-other	0.00

Table 3.9 Gold and Foreign currency reserves of Singapore (USD, million) [189]

December 2013	
A. Official reserve assets	273,065.10
(1) Foreign currency reserves {in convertible foreign currencies)	270,173.40
{a) Securities	219,118.00
of which: issuer headquartered in reporting country but located abroad	0.00
(b) total currency and deposits with:	51, 055.40
(i) other national central banks. BIS and IMF	475.60
{ii) banks headquartered in the reporting country	3,649.70
of which: located abroad	0.00
(iii) banks headquartered outside the reporting country	46,930.10
of which: located in the reporting country	46,123.40
(2) IMF reserve position	1,024.80
(3) SDRs	1,344.80
{4) gold {including gold deposits and. if appropriate, gold swapped)^	211.70
-volume in millions of fine troy ounces	4.10
(5) other reserve assets (specify)	310.40
-financial derivatives	0.00
-loans to nonbank nonresidents	0.00
-other	310.40
B. Other foreign currency assets (specify)	
-securities not included in official reserve assets	
-deposits not included in official reserve assets	
-loans not included in official reserve assets	
-financial derivatives not included in official reserve assets	
-gold not included in official reserve assets	
-other	

Table 3.10 Gold and Foreign Currency Reserves of the USA (USD, million) [189]

December 2013	
A. Official reserve assets	144,373.70
(1) Foreign currency reserves {in convertible foreign currencies)	42,605.46
(a) Securities	21,969.23
of which: issuer headquartered in reporting country but located abroad	
(b) total currency and deposits with:	20,636.23
(i) other national central banks. BIS and IMF	20,636.23
{ii) banks headquartered in the reporting country	
of which: located abroad	
(iii) banks headquartered outside the reporting country	
of which: located in the reporting country	
(2) IMF reserve position	30,634.16
(3) SDRs	54,976.34
{4) gold {including gold deposits and. if appropriate, gold swapped)f	11,041.06
-volume in millions of fine troy ounces	261.50
(5) other reserve assets (specify)	5,116.68
-financial derivatives	
-loans to nonbank nonresidents	
-other	5,116.68
B. Other foreign currency assets (specify)	
-securities not included in official reserve assets	
-deposits not included in official reserve assets	
-loans not included in official reserve assets	
-financial derivatives not included in official reserve assets	
-gold not included in official reserve assets	
-other	

Table 3.11 Gold and Foreign Currency Reserves of Great Britain (USD, million) [189]

December 2013	Monetary Authorities	Central Government
A. Official reserve assets	25,933.00	109,033.00
(1) Foreign currency reserves (in convertible foreign currencies)	11,115.00	64,809.00
(a) Securities	10,205.00	64,276.00
of which: issuer headquartered in reporting country but located abroad	0.00	0.00
(b) total currency and deposits with:	909.00	533.00
(i) other national central banks, BIS and IMF	44.00	395.00
(ii) banks headquartered in the reporting country	861.00	1.00
of which: located abroad	0.00	0.00
(iii) banks headquartered outside the reporting country	4.00	137.00
of which: located in the reporting country	0.00	0.00
(2) IMF reserve position	0.00	7,813.00
(3) SDRs	0.00	14,820.00
(4) gold (including gold deposits and, if appropriate, gold swapped)	0.00	12,479.00
—volume in millions of fine troy ounces	0.00	9.98
(5) other reserve assets (specify)	14,818.00	9,111.00
—financial derivatives	-185.00	2,741.00
—loans to nonbank nonresidents	0.00	0.00
—other	15,003.00	6,370.00
B. Other foreign currency assets (specify)	0.00	2.00
—securities not included in official reserve assets	0.00	0.00
—deposits not included in official reserve assets	0.00	0.00
—loans not included in official reserve assets	0.00	0.00
—financial derivatives not included in official reserve assets	0.00	2.00
—gold not included in official reserve assets	0.00	0.00
—other	0.00	0.00

Appendix H

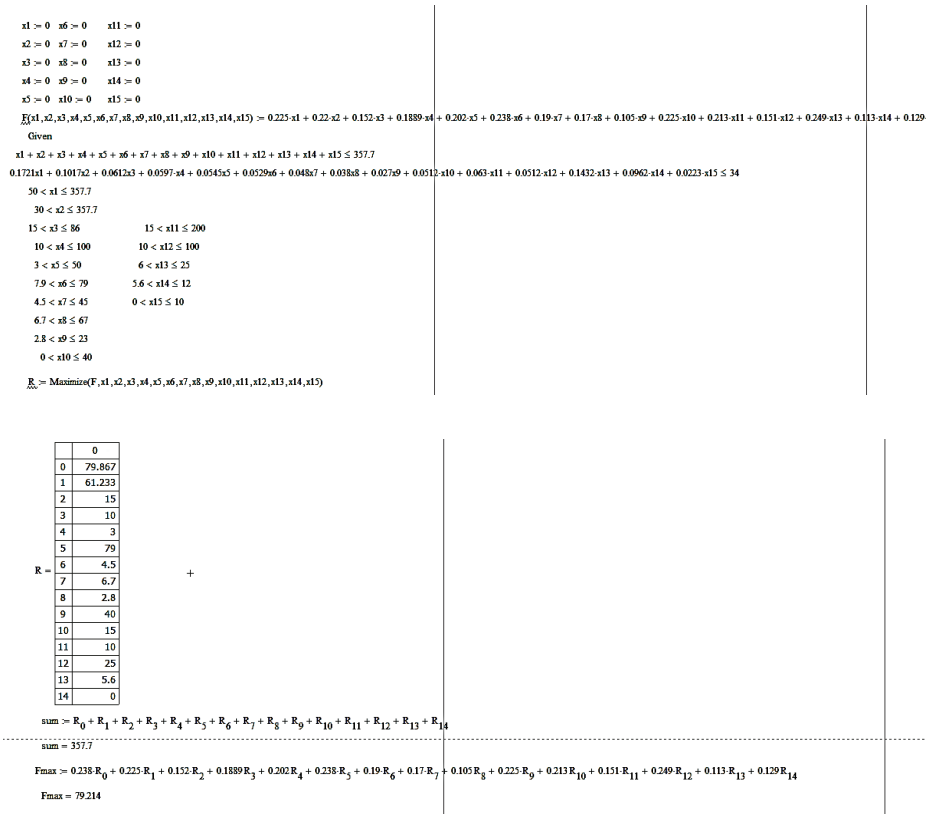

Fig. H.1. Solution of Gold and Foreign Currency Reserves Optimization Problem No. 1 by Means of MathCad Software

Appendix K

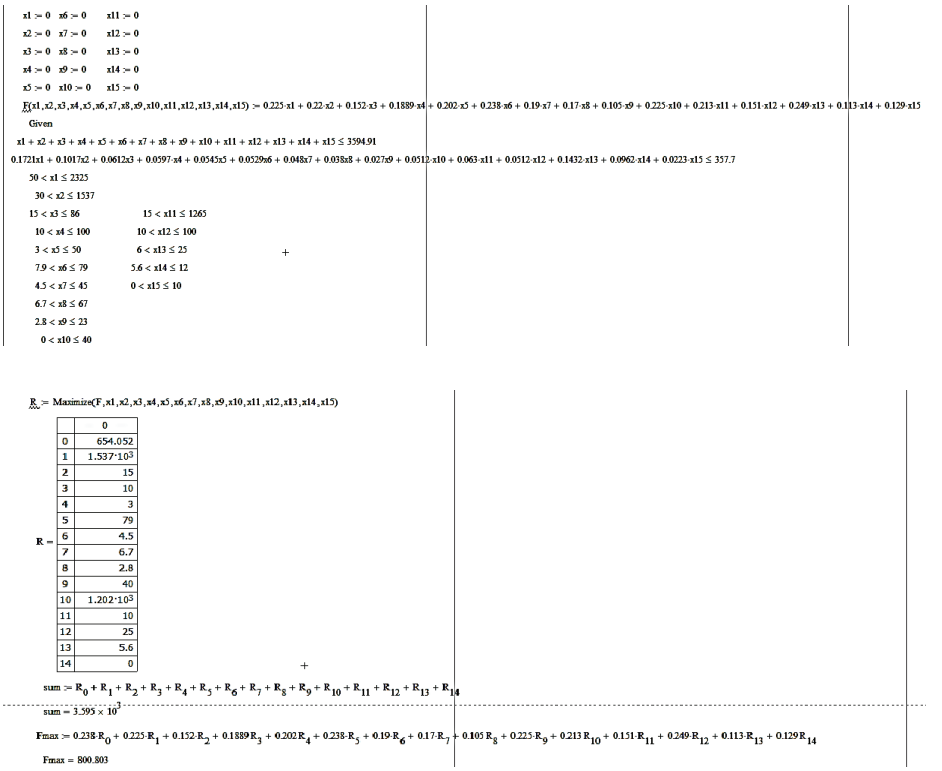

Fig. K. 1. Solution of Gold and Foreign Currency Reserves Optimization Problem No. 2 by Means of MathCad Software