

THEORETICAL AND PRACTICAL ASPECTS OF THE MECHANISM OF MONEY SUPPLY CREATION IN MOLDOVA

Cociug Victoria, Ph.D, ASEM,
Timofei Olga, Ph.D stud., ASEM

Abstract: *This article brings the proof that the money supply in the economy is not a simple process but depends on a number of complex processes that reflect the mutual interaction between the central bank, commercial banks and non-monetary subjects. There was reflected the role of each subject that takes part into this process of money creation. It was also tried to be demonstrated the scenarios made for the situation of Republic of Moldova.*

Keywords: *money market, money offer, currency, monetary weight, money politics.*

The mechanism of creation of money supply in circulation is a complex process due to its dependence on a number of factors that get out of control of monetary authorities and monetary crediting promoted policy. It provides that assurance and optimal adjustment amount of money in circulation, according to demand and real sector and banking needs, is one of the most important tasks of any central bank.

The creation of money supply in the economy is due not only to central bank but commercial banks and non-monetary subjects too. Achieving changes within the **banking system** in money can be made either through monetary emission process (the central bank), by creating money to other banks, or by multiplying initial central bank monetary creation. **Non-monetary subjects** participating in the creative process in a less direct way, namely through: creation and modification of the volume of deposits at monetary institutions, change their structure after the test period, change to the size of the monetary demand for credit, change for ex transactions, current and financial, etc..

In this context, **factors that will determine the development of the creation of money supply** in the economy will be close to those that influence behavior and non-banking subjects involved, namely: production volume, rate, required reserve ratio, the volume of retail sales, amount of taxes collected in the state budget, foreign reserves of the state, the state government budget and external balances, the existing rational expectations, a greater choice of alternative financial assets, etc.. The conclusion is: most of these factors are not controlled by monetary authorities and that the latter can not influence money supply calculated on the monetary policy instruments available credit.

But it is certainly central bank's role in the creation of money supply because the economy is the only institution empowered with the right creative and shows the primary currency. Optimizing this show is one of the key issues of monetary policy lending us there is a unit of views among economists across the subject. Process currency issue is controversial influences: on one hand: stimulate lending activity of banks, lack of money in the economy wound, help revive economic activity and short-term increase in GDP, and on the other hand: show undue may lead to increased inflationary processes, economic imbalances and other undesirable social and economic consequences. For these reasons monetary issue problem solving is a major theoretical and practical importance.

Contemporary economic literature presents different views on the concept of currency issue. According to a group of authors with currency issue *is considered money all operations to create whatever form* [7, p. 72]. Followers of other views, believes that any issue of money in circulation can be considered currency issue, because the banks in cash or loan operations generate a process of circulation of money in the opposite issue. Of those, as currency issue can be considered *only the circulation of money by banks which will directly increase the money supply* [3, p. 49].

The views expressed do not reflect fully the nature and practical significance of the process of currency issue. The central bank issued the first stage primary currency through various transactions (refinancing of commercial banks, government lending) which leads to increased central bank liabilities, viz. the corresponding increase in the monetary base. At that stage is already involved commercial bank using their characteristic mechanism for creating additional payment instruments (credit issue) and increase the final balances in current accounts of clients. This process is called ***multiplicative expansion of money*** and is characterized by well-known formula - ***“Loans make deposits”***, viz. loans create deposits.

In this way, *commercial banks participating in the process of issuing currency issue as additional means of payment and receive free resources available in circulation, a phenomenon that fully reflects the fundamental role of the banking system: continuous multiplication of money in the process credit*. The existence of this phenomenon is due to modern payment systems operation and use the principle of double entry accounting. Priority given, however, central bank operations that lead to increase the monetary base (commercial bank lending, repurchase of securities, currency, etc.). The same view is Russian economist A. Illarionov, who believes that “... amount of money in circulation is determined entirely by issuing central bank lending. Increase CB indispensable assets will increase the monetary base that is multiplying the money supply increases, which in turn determines the acceleration of positive dynamics of inflation. Central Bank - the only institution in the country, which it is allowed “creating money” [4].

However, in reality the money supply in the economy depends on a number of complex processes that reflect the mutual interaction between the central bank, commercial banks and non-monetary subjects. What deserves mentioning here is that money in circulation does not change the mutual relations of different subjects or in non-monetary outcome of relations between commercial banks. In this regard, the main rule is that the table be amended only by monetary relations between monetary institutions on the one hand, and non-monetary subjects (population, production companies, commercial etc., Monetary financial institutions), on the other hand. Thus, payments, refunds, etc. the first and second population of producers, traders etc. just transfer money from one owner to another, do not change their quantity. Also, payments, credits, refunds, etc. do not affect the size of the monetary institutions of mass money, because money does not affect the amounts held by non-monetary subjects (all of which is included by definition, the monetary mass). Respectively on the money supply will affect central bank operations with commercial banks, commercial bank transactions with people, other types of interconnections of these participants will not have influence on money.

The central bank issued currency into circulation through commercial banks' refinancing operations (which is one of the most commonly used broadcast channels). This issue will be reflected by an increase in the quantity of money balances of correspondent accounts. An increase in the amount of money in the accounts of commercial banks and the population can be generated by depositing money in cash. When the bank gives the customer a loan, the quantitative change in the volume of real

money (excluding changes in correspondent accounts) does not appear in bank asset is a loan account, which reflects the amount of credit flow and the same amount in credit passive form so-called imaginary store. Viz., multiplying the money of account occurs when commercial bank lending and credit accounts reflect the needs of its customers, because the principle of double entry accounting.

In this way, banks create money is held, just as if the central bank, through credit operations, and in this regard is to create deposits “imaginary” as a result of granting loans and higher balances on accounts current customers. On this process of money creation has its primary influence central bank, viz. the volume of refinancing through the issuance of its commercial banks. Therefore, the developer money and issue money creation process is always the central bank, commercial banks, *as creativity determines the maximum volume of money in circulation by other commercial banks.*

In this context the issue of currency will understand the issue of money in circulation through the central bank refinancing operations of commercial banks and other financial market transactions, which will increase the monetary base, and therefore the result of uncontrolled landfills the banking system - to increase money supply in circulation.

The central bank creates and feeds the primary currency other banks, especially the following ways: granting (repayment) of loans, grant (repayment) of loans to other subjects, primarily the central government, the purchase (sale) of securities, purchase (sale) of foreign means of payment, precious metals and stones.

Central bank loans to other banks have relatively strong effect on the potential of creating the money supply of the latter, because all changes are initial resources available to commercial banks, the main way of creating and abolishing primary currency.

Central bank loans to non-bank subjects, first the central government, is an indirect way to change the initial resources of commercial banks. Thus, a rule that recipients of these loans quickly used for payments outside the central bank making facilities procured through loans from the central bank to come relatively quickly in accounts with other banks or the public. However, the occurrence of such resources in accounts at commercial banks is not entirely changing the initial resources to them. As noted, banks are in possession of such means as increasing customer deposits, which should be required reserves and possible reserves optional. That the central bank loans and other subjects like the state treasury is only partly original appearance of the primary currency and thus constitutes only a partial credit basis for multiplication and growth of money supply from banks.

Purchase-sale of securities by the central bank has different effects depending on the quality of its partners in these transactions, insofar as partners in the buying or selling securities are banks, the effect is similar to that manifested in the granting (repayment) of loans to commercial banks. To the extent that partners from the central bank buys or sells securities that are subject to non-bank (for this purpose using existing money in their accounts at banks), the effect is similar to that which is manifested in the occurrence or disappearance resources in the form of customer deposits (including, therefore, in terms of correction required minimum reserves and reserve liquid optional) finally, whether sellers or buyers are subject to non-bank securities, which are used for this purpose cash transactions that have no effect on the potential lending banks.

Purchase-sale of foreign means of payment (currency and currency) by similar effects to the central bank buying, selling securities: these effects depend on the quality of CB partners in these transactions.

Not all lists above operations lead to increase the monetary base, of which only part of the purchase of foreign currency transactions, the purchase of precious stones and metals and certain payments made by the central bank cashier. The remaining

operations do not increase the money supply and monetary base, but changes its structure by exchanging cash money account.

Central Bank exercises its influence on money supply primarily through monetary base. Monetary base includes cash in circulation (Mo) and bank reserves. Changing the monetary base has a multiplier effect on money supply. In other words, at first glance it appears that the volume of money supply routing takes place by changing the initial monetary base CB bonds through changes to the public and the banking system (through the influence of money in circulation and reserves volume) and subsequent changes by multiplying the money supply at a commercial bank.

In this way, the definition of money required for the movement, must be based not only on the definition of monetary base but also to consider the effects multiply. In general, the additional supply of money resulting from the emergence of a new deposit is characterized by well-known formula multiplier bank (or deposit):

$m = \frac{1}{rr},$	(1)
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where: m - banking multiplier, rr - minimum compulsory reserve established by the central bank.

But to say that the effect of monetary policy measures on money supply is reflected in the monetary base is not the same as saying that the monetary base is an accurate indicator of monetary policy. More specifically, the monetary base movements reflect not only exogenous actions, voluntary, central bank, but are themselves largely endogenous. First, cash in circulation is determined entirely by demand. Secondly, changes by the central bank's supply of bank reserves are the short term, largely, of fluctuations in demand for reserve accommodations.

And in addition, not all free money is the amount of resources used by commercial banks to issue loans, in part because of money commercial banks prefer to invest in other financial assets elsewhere to keep on correspondent accounts to ensure continuity of payments, and substantial amounts thus are hoarded in the form of cash, population. For these reasons, the actual multiplication of money by the bank system is much smaller. To take account of these factors influence the monetary multiplier is used, which is determined by the ratio of money supply and monetary base, and the number of times will increase the money supply in the economy as a result of increasing the monetary base.

Given that broad money (M2) includes cash in circulation and bank deposits and the monetary base includes cash in circulation and commercial bank reserves, money multiplier (mm) can be determined by the relationship:

$mm = \frac{cu + 1}{cu + re},$	(2)
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where: the-relationship between currency and deposits (storage coefficient), re - the ratio of reserve holdings and deposits (the reserve ratio);

From formula (2) that: 1) how the storage coefficient is higher, the lower the money multiplier: $cu \uparrow \Rightarrow mm \downarrow$; 2) the higher will be the reserve ratio, the smaller will be monetary multiplier: $re \uparrow \Rightarrow mm \downarrow$;

The monetary multiplier is influenced by the total weight of cash money, the size of reserves, loans and other assets ratio of commercial bank portfolio. In this way the greater share of cash money, reserves and resources optional banking, securities and currency banking assets the weaker the banking multiplier effect will be.

Storage coefficient (with) depends largely on public preferences for cash or deposits. These preferences are influenced by several factors such as economic and the social, educational, cultural, etc. For example: income, banking development (particularly diversifying deposits), interest rates on deposits, etc.

The reserve ratio, other factors influence, and in particular the interest rate market, the central bank base rate, reserve requirement rule, and uncertainty associated with cash inflows and outflows in the bank. In this way, the rule reserves can be represented as a function of four variables:

$$\boxed{re = f(i, i_p, rr, \delta)} \quad (3)$$

where i - the interest rate market, i_p - the central bank base rate, rr - norm of compulsory reserves, δ - indicator of the degree of uncertainty associated with cash inflows and outflows in the bank.

Proceeding from the function (3) market interest rates will stimulate more commercial banks to better use resources, placing them in the form of loans and other assets. Monetary multiplier will increase so if $i \uparrow \Rightarrow re \downarrow \Rightarrow mm \uparrow$.

Meanwhile, a high base rate set by the central bank will lead to the creation of additional voluntary reserves by commercial banks to minimize the costs of refinancing by the central bank. Monetary multiplier in such circumstances will have a negative dynamic: $i_p \uparrow \Rightarrow re \uparrow \Rightarrow mm \downarrow$.

Norm reserves directly influence and indirect multiplier coefficient reserve money, ie reserves as the standard is higher the greater the reserve ratio, and even less money multiplier: $rr \uparrow \Rightarrow re \uparrow \Rightarrow mm \downarrow$.

And finally, the higher the changes in input and output means money in the bank are, the higher is uncertainty, that leads to increase reserves emoticon: $\delta \uparrow \Rightarrow re \uparrow \Rightarrow mm \downarrow$.

Note that the variables cu and re are not constant, depending in everything on promoted central bank policy. And as economists, R. Dornbusch and S. Fischer, have said "... monetary multiplier is not a constant variable or predicted accurately. Even the slightest change can cause the multiplier, under a constant currency basis, essential changes in the money supply [5, p.386]. Constant multiplier is a central bank using the money itself to size. Multiplier is one of the most complex macroeconomic variables whose fluctuations are the resultant effects exerted by a plurality of money causes.

In this way, *monetary authorities can not control the money supply target because commercial banks and their freedom make decisions for the establishment of voluntary reserves, the real sector credit and storage coefficient depends on the preferences and behavior of people, and may not be directly or indirectly manipulated by the central bank.*

Monetary multiplier has some significant drawbacks:

- Commercial banks 'excess reserves include cash balances of commercial banks' vaults, funds from the central bank correspondent accounts, deposits with the central bank and central bank securities. But credit can be issued only at the expense of those who are cash on commercial bank account, that much of the reserves can not be regarded as a source of multiplication of money, although money multiplier formula includes all of the volume of reserves;

- Repetition of cash (Mo) and the numerator and the denominator formula monetary multiplier, the indicator distorts the process of money creation by commercial banks;

- Method of determining the monetary multiplier takes into account the temporary lag between the monetary base growth and multiplication results, approximately 2-3 months, which also distorts the multiplication rate of money [6, p.38]

- Monetary multiplier does not account for the structure and diversity of deposits, interest on these, which directly influence people's preferences and therefore the storage coefficient.

The ratio of cash and deposits is determined by the behavior of the population, or more precisely, the cost of keeping money in the form of deposits and alternative method of keeping money in cash. Usually, the coefficient of storage is considered a constant size, but because borrowing can arise from the decision to transfer money to accounts in the interest rate of deposits and withdrawals from the account cost. On the other hand keeping money in cash is more beneficial because of the high liquidity.

In this regard, some researchers, modeling dynamic monetary multiplier, delimit sight deposits and time [1]. The result was obtained following the monetary multiplier formula:

$$mm' = \frac{\alpha + \beta + 1}{\alpha + re(1 + \beta)}, \quad (4)$$

where: α - the ratio of cash and term deposits, β - the ratio of demand deposits and time deposits, re - the ratio of reserve holdings and deposits (the reserve ratio).

Demarcation term deposits according to maturity as a consequence of the hypothesis that the coefficient β , and that the multiplier itself, must be proportionate interest sight deposits and time deposits inverse interest.

Parameter α is determined by the complexity of financial markets. In other words, higher the offer liquid financial assets available is lower the demand for money is and more money multiplier. May influence on this parameter and different institutional and technological changes. For example, the use by organizations and business banking services through the issue of wage cards, ATMs, etc. system development. A variable will decrease due to decrease in volume of cash in the hands of people and need it.

Finally, the parameter α is influenced by the size of the shadow economy, since all transactions are in it mainly with cash. Extending the shadow economy will increase demand for currency and demand deposits decrease, which also will lead to increased variable α , and vice versa.

Studies have shown that central bank interest rate through refinancing operations of commercial banks influence the demand for excess reserves. If central banks would use the discount window policy, which helps stabilize the payment system by supplying liquidity during times of imbalance, instead of using sanctions and fines if the request to reserve, the surplus would have been lower. In this case the request to surplus reserves will change in direct proportion to their use of sanctions and fines central bank refinancing operations [2].

Based on the foregoing, the monetary multiplier determined by the ratio of broad money (M2 aggregate in our case) the monetary base depends on:

- Financial market rate;
- Expectations of economic agents;
- Level of development banking;
- Volume of production in the economy.

High interest rates on financial market reduced demand for bank loans, which also hampers the process of multiplication of money. A similar situation applies in the case's spread between interest rates on loans and deposits: with increasing this indicator will decline in credit demand and monetary multiplier respectively.

High rates on deposits, by contrast, will stimulate people to make savings in banks, which also will increase the resources of commercial banks to make further lending operations. The interest rate on interbank loans as reflecting the liquidity of the banking system. Increasing the cost of interbank loans to the reduction takes place every free resource available to banks.

Monetary multiplier affects production volume by cause-effect relationships. First, as the expansion increases production capacity needs of the new loans. In the second place, increasing production is accompanied by increased cash flows and profits in the economy, which also results in increased deposit balances in the banking system.

The emotion for money up in the national economy should also be mentioned that during the years 2004-2009 the monetary base increased by approximately 96.8% in nominal and 23.3% in real value. Its unstable growth trend, as shown in Figure 1, is largely due to efforts of the National Bank of Moldova (NBM) in ensuring macroeconomic stability. NBM monetary policy pursued by the target this time several objectives, including reducing inflation, maintaining a competitive exchange rate of national currency and accumulating international reserves. Remittance flow characteristic than the previous period of global financial crisis has increased by 2008 including pressure on currency appreciation towards it. In these circumstances, BNM intervened in the for ex market to reduce the amount of foreign currency, thus increasing the country's international reserves. And to counter inflationary pressures brought about by increased efforts to sterilization and the downturn in the monetary base.

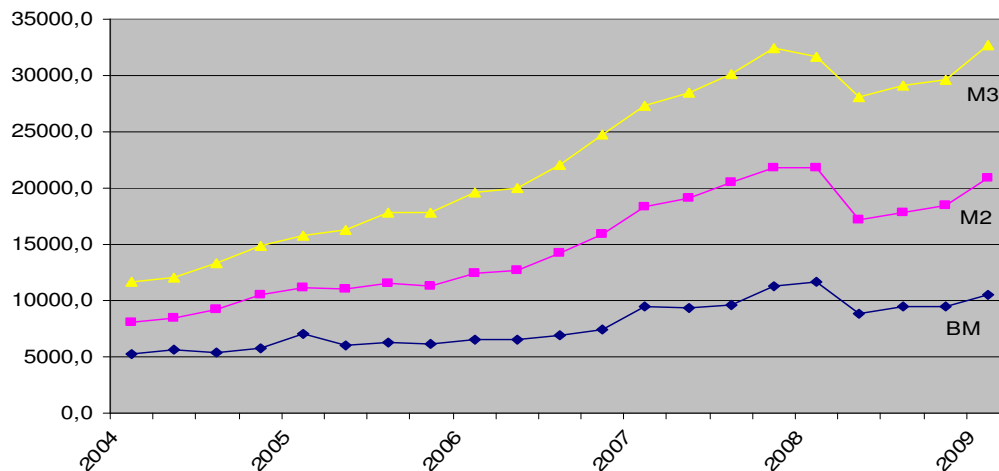


Figure 1. Dynamics of monetary indicators and monetary base in Moldova (in mil) *

* Source: Prepared by author based on statistics of the NBM.

In early 2009 reflected the dynamics of money supply indicators negative trends, just by changing their trajectory in May and recording signs of stabilizing. These fluctuations left their imprint on the structure of the monetary base, see Figure 2.

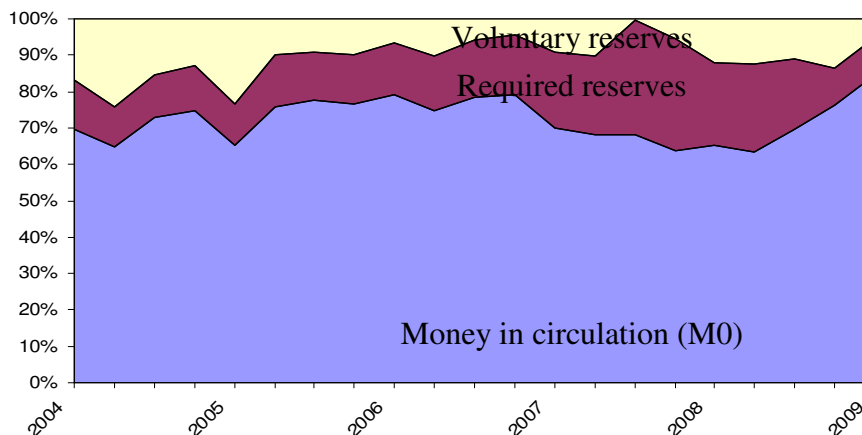


Figure 2. The structure of the monetary base in Moldova in the years 2004-2009 (%).

* Source: Prepared by author based on statistics of the NBM.

In Figure 2 are well observable changes that have occurred in the structure of the monetary base since mid-2008 when the NBM increased regulation reserves from 16% to 22%, which has forced many banks to lower the maximum voluntary reserves climbing resources. In 2009 in response to decreasing reserves rule situation has stabilized. Decrease voluntary reserve ratio would give evidence of increased stability of commercial banks and financial market volatility decrease.

But if we follow the evolution of indicators in Figure 3, we note that commercial banks in Moldova still does not function as money creation in the economy, streamlining lending activity. Regardless of the trends outlined in the last year the monetary multiplier is very low. In this way, from 2004 until 2009, the monetary multiplier in MDL money (M2) increased from 1.53 to 2.0, while the wider money supply (M3)¹, 8 to 3.12, that while the developed countries this indicator is between 8-10.

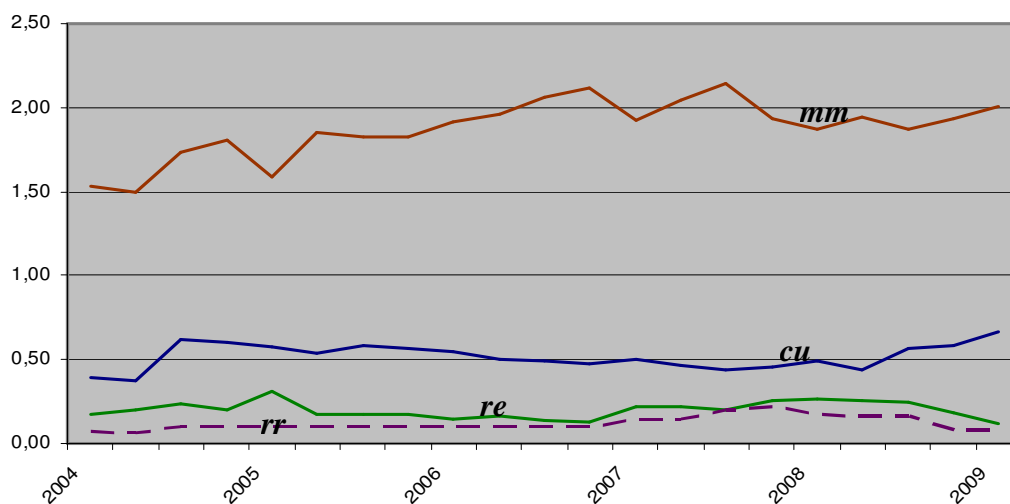


Figure 3. Dynamic monetary multiplier (mm), coefficient of storage (with) reserve ratio (Re) and norms of mandatory reserves (RR) for the years 2004-2009 in the Republic*

* Source: Prepared by author based on statistics of the NBM.

¹ We determined the dynamic multiplier M2 because the national bank system not participate in the multiplication of money in foreign currency.

See *Figure 3* and confirm the theoretical hypothesis on the negative relationship between the coefficient of storage reserves and monetary multiplier rule. Viz., decreasing the amount of money in circulation and that the cash-deposit ratio and decreasing the reserve ratio - deposits somewhat favored raising the monetary multiplier. Emotion can be viewed as a positive trend.

Among other things, as seen from the chart, keeping unchanged over a period of time did not influence the norms of mandatory reserves in no way the monetary multiplier. In other words that the monetary multiplier is more sensitive to changes in rate coefficient and online storage, ie the factors not directly by the monetary authorities.

Finally the money multiplier process stalled national economy based on the analysis of the following reasons: the orientation of commercial banks on short-term transactions with state securities and other financial assets, credit dollarization, monetary circulation and savings, higher proportion of cash in broad structure money, high risk lending operations of the real sector of economy.

Ensuring sustainable growth of national economy is due primarily to activation of credit expansion in the real economy, and to increasing the money multiplier process by commercial banks.

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