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Abstract. This article is devoted to the calculation of money supply, which is an important element of monetary policy, and contains a new approach to the essence of the money supply, on the basis of which new proposals are made to improve monetary aggregates and the value of the monetary multiplier in monetary policy.

Keywords: money supply, money aggregates, money multiplier.

As you know, the main goal of the monetary management (Central bank) of all countries is to achieve price stability. The central bank, within its competence, implements monetary policy by influencing the money supply in circulation through available instruments. Since scientists-economists believe that the real volume of products produced in the country, changing estimates and ensuring employment are interconnected with a change in the money supply.

We agree with the opinion of economists that the real volume of products produced in the country, changing estimates and ensuring employment are associated with a change in the money supply. At the same time, we believe that in the implementation of monetary policy there are certain uncertainties in the definition of the essence of money and the use of monetary aggregates. The new theories created today in the monetary sphere and the changes taking place in the monetary policy of the Central Banks of developed countries confirm our opinion.

Therefore, we intend to assess the essence of money, submit our proposals for the further effective use of cash aggregates and cash multiplier. We consider it advisable to start our thoughts by clarifying the essence of money and monetary aggregates.

The essence of money: In our opinion, money is a legal means of payment turned by the state or its authorized body. For example, the dollar is US money that is issued under the Federal Reserve Act by the Federal Reserve System. The euro, the currency of the European Economic Area, is issued by the European Central Bank. Everyone knows that in the legislation of many developed countries such an assessment was given to money.

However, well-known scientists have described money in a broader sense. In particular, in the prestigious economic literature, **money is called highly liquid assets.**

It is true, money is an item in the active part of the balance sheet of accounting. An asset refers to property or wealth that generates income in the economy. Despite the fact that money does not bring direct income, according to accounting rules, money is placed at the maximum stage of the balance sheet asset, that is, money is included in the number of liquid assets with the highest level of liquidity.

However, the vocabulary of the word liquid means the meaning of assets that quickly and easily become money in both Latin and French, or have the ability to quickly sell. Based on this, if the liquidity of other assets is determined in relation to money, it will not make sense to call money itself a "highly liquid asset." Therefore, we believe that "money is a legal means of payment issued by the state or its authorized body," which directly reflects its essence and, based on this conclusion, we express our views.

Monetary aggregates: Definitions issued by world scientists to monetary aggregates have no contradictions. According to most experts, "monetary aggregates are a quantitative concept that describes the composition of the money supply." Pointers used in the definition and use of monetary aggregates should not contradict the essence of money. When determining the composition of the money supply, it is necessary to pay attention to real money, that is, legal tender funds issued by the Central Bank.

Is it true in fact? In modern economic literature, a variety of indicators (monetary aggregates) are used that characterize the money supply. It is also proposed to use various terms relating to monetary aggregates, both of the organizations regulating the world monetary system and of the International Monetary Fund. In particular, the US Federal Reserve uses the following monetary aggregates:

MO = Physical paper and coin currency in circulation;

M1 = Cash in circulation + deposits (cash checks and other deposits) held on demand of all types;

M2 = M1 + Fund + Saving Deposits;

M3 = M2 + other liquid assets (certificates of deposit, as well as various transactions concluded in Euro and Dollars).

It is noteworthy that within the above money aggregates, "cash in circulation" reflects real money, in addition, all other indicators consist of "deposits" (saving, fund, term and others). However, deposit is money? In Latin, the word deposit means taking money for storage. Deposits, under whatever conditions they are accepted, must be returned to the owner, and interest is paid on certain types of deposits (savings). So, the deposit is not asset, but is an obligation for the bank (in accordance with accounting rules, the asset generates income, and the obligation requires spending).

As mentioned above, money (cash in the bank cash desk and money in its correspondent account) is an element of the "asset" of accounting, since it is indicated on the left side of the balance sheet. Deposits considered "money" or "money supply" are obligation for the bank and are reflected on the right side of the balance sheet, since they are a "passive" element of accounting.

Equating money as an "asset," but when calculating the amount of money (monetary aggregates) equating them with an obligation that is considered a "passive" element of the balance sheet, contradicts not only accounting rules, but also simple scientific logic.

We expressed our opinion based on theory with money and monetary aggregates. Now we see how directly these objects are used.

Before we begin to work, we use monetary aggregates used by the US Federal Reserve and some of the concepts used in the economic literature. At the same time, in order to achieve the goal, we will introduce a new index to today's banking practice. For example, we conditionally take M0 the available amount of money in a correspondent account of a commercial bank. So, M100 = the amount of money in the correspondent account of a commercial bank. To achieve the goal, the Central Bank issued money for the first time and we believe that there are no other funds in the banking system.

For example, the Central Bank allocated 100 \$ in non-cash loans to a commercial bank (transaction-1). At the same time, the issued loan is reflected in the loan account on the balance sheet of the Central Bank as an asset and as obligation in the correspondent account of the relevant commercial bank (the obligation on the balance sheet of the Central Bank is funds in the correspondent account of the commercial bank). **This means that the Central Bank issued non-cash money in this amount, that is, a legal means of payment.**

Central Bank

Active	Passive
Loan account - 100	Correspondent account of a commercial bank - 100
Total - 100	Total - 100

This transaction (transaction-2) on the balance sheet of commercial banks is reflected as an asset in the form of non-cash money in a correspondent account, and the amount of the loan received from the Central Bank is reflected as an obligation in the passive part of the balance sheet.

(Transaction-2)

Commercial Bank

Active	Passive
Correspondent account - 100	Obligation account - 100
Total - 100	Total - 100

On the balance sheet of the commercial bank, according to the accounting rules, the reverse actions were performed in relation to the above transactions reflected on the balance sheet of the Central Bank. Or, on its balance sheet, 100 \$ in the amount of the asset in active side of balance sheet, liability is reflected in passive side of balance sheet for this amount. Please note that money in circulation may arise before the formation of a deposit.

We recorded that the Central Bank issued non-cash money in the amount of 100 \$. However, if now the money supply is measured on M1 or M2 aggregates, then you will not find new issued 100 \$. So where did those 100 \$ go? The money we are looking for is in the correspondent account of a commercial bank. This is real money, a new M100 money unit, which we proposed.

Based on this, as an indicator reflecting the amount of money in circulation M, it is advisable to use not substances of the passive part of the bank (currently using deposits), but substances reflecting the money itself in the active part of the balance sheet, M100 (non-cash money in a correspondent account).

So we'll continue our research. A commercial bank may, for the purpose of generating income, conduct various active transactions from available available funds in its correspondent account. For example, the bank issued a loan of 50 \$ to its client (transaction-3). Let's imagine that the loan money was transferred to the deposit account of the customer on demand account, opened in this bank. At the same time, the following changes occur on the bank's balance sheet. In its active part, would appear 50 \$ in the form of a new asset a loan account, and in the passive part - a deposit account stored on demand equal to this amount.

(Transaction-3)

Commercial bank

Active	Passive
Correspondent account - 100	Obligation account - 100

Loan account - 50	Checking Account - 50
Total - 150	Total - 150

As a result of this transaction, the balance of the currency of the commercial bank balance (total amount of assets and liabilities) increased by 50 \$ (150-100), but in the correspondent account of the bank - 100 \$ has not changed. Since the loan went to the account of the client of this bank. Most surprisingly, a new deposit was created, but the amount of money did not change.

In this example, the amount of cash in circulation is zero, since no cash was emitted in circulation, and also saving deposits have not yet appeared in the bank, which is also zero. The volume of all types of checking deposits is 50 \$. So, the amount of money in circulation:

$M1 = 50 \text{ \$ (cash in circulation + all types of checking deposits (cash cheques and other deposits))}$;

$M2 = 50 \text{ \$ (M 1) + 0 (Saving Deposits)}$;

$M3 = 50 \text{ (M1) + 0 (M2)}$

However, as a result of transactions 1 and 2, the Central Bank issued 100 \$ of non-cash money, did not? Where has gone the remaining 50 \$? If they are evacuated according to the method proposed by us, then this money, that is, 100 \$, is in the correspondent account of the bank. So, the money supply, as we said, is calculated in the active part of the balance sheet using substances reflecting real money, is equal to $M = 100 \text{ (M0) \$}$, that is:

$M = 100 \text{ (M100)}$

Now we will focus the direction of scientific search, deposits on the bank's balance sheet, which are divided into types according to their economic meaning and shelf life, as well as signs, that is, M0, M1 and M2, reflecting the amount of money in circulation.

We use the example above again. According to it, 50 \$ transferred to the client's checking deposit account due to a bank loan. Now client decides to divide this money into 20 \$ in the form of a liquid asset, and the remaining 30 \$ - into:

20 \$ for a saving deposit;

Money market deposit is 10 \$,

Due to these transactions (transaction-4), the bank balance is changed as follows:

(Transaction-4)

Commercial bank

Active	Passive
Correspondent account - 100	Obligation account - 100
Loan account - 50	Checking deposit account - 20
	Saving deposit account - 20
	Money market deposit account - 10
Total - 150	Total - 150

Now we calculate the total money supply taking into account the changes that have occurred in M1 and M2. If to calculate in traditional way $M1 = 20 \text{ \$}$, $M2 = 50 \text{ (20 (M1) + 20+ 10) \$}$, total money mass $M = 50 \text{ \$}$ or:

$M1 = 20$

$$M2 = 50 (20 (M1) + 10 + 20)$$

$$M = 50 (M1 + M2)$$

If the money supply is calculated based on the proposed method, that is, the amount of funds in the correspondent account of the bank, the total money supply $M = 100$ \$ or:

$$M = 100 (M100)$$

This amount is the precise amount of money issued by the Central Bank. Moreover, transactions 3 and 4 once again proved our above thoughts from practical

Obviously, the traditional method used in practice and the method proposed by us, when calculating the money supply, have two different results. We would suggest using the M100 index when calculating the money supply in circulation (not the amount of funds issued to circulation). After all, by this method we believe that a direct determination of the actual amount of money in circulation will be achieved.

Money multiplier. As you know, the process of repeatedly increasing the money supply was called a money multiplier in science because of new deposits of commercial banks.

However, in our opinion above, the issue of money is carried out only by the Central Bank. And commercial banks redistribute credit resources, emitted as non-cash money by the Central Bank by lending to their customers.

We will once again try to prove our opinion. To achieve this, we use the previously mentioned banking operations and imagine that the standard "Mandatory Reserve" established by the Central Bank is 10% and there are no other funds in the banking system.

So, let's say commercial bank (conventionally called commercial bank as "Bank-1"), as a result of its client's open market operation, took a deposit of 100 \$ (operation - 1). At the same time, the amount of the taken deposit is reflected as an asset (active) in the correspondent account of Bank-1 and as a deposit in checking account of client (passive). The total amount of money in circulation, that is, the offer of money will be equal to 100 \$.

(Operation-1)

Bank-1

Active	Passive
Correspondent account - 100	Checking account -100
Total - 100	Total - 100

Now this bank can carry out active operations to generate income, in particular to lend to customers. However, Bank-1 cannot use all the available amount of money for this purpose, since it transfers 10% of the deposit, that is, 10 \$ as a mandatory reserve to the Central Bank (this is the procedure established in the practice of our Republic). This process is specified in the next step-2.

(Operation-2)

Bank-1

Active	Passive
Correspondent account - 90	Checking account -100
Mandatory reserve amount - 10	
Total - 100	Total - 100

So, Bank-1 can lend 90 (100-10) \$. The bank did it and transferred 90 \$ as loan to a deposit account of the client of another bank (conditionally Bank-2). As a result, the following changes occur in the balance sheet of banks participating in this transaction.

(Operation-3)

Bank-1

Active	Passive
Correspondent account - 0	Checking deposit account - 100
Mandatory reserve amount - 10	
Issued loans - 90	
Total - 100	Total - 100

The amount of money in the correspondent account of the Bank-1 will decrease by 90 \$ and a new asset will appear equal to this amount - "Issued loans." There is no change in the passive part of the balance sheet. Thus, the amount of the accepted deposit will remain at 100 \$ (Operation-3).

The following changes occur in the Bank-2`s balance sheet. In its active part, 90 \$ of money received in the correspondent account appeared, and in the passive side of balance sheet appeared money in clients checking account in this amount as well (Operation-4).

(Operation-4)

Bank-2

Active	Passive
Correspondent account - 90	Checking deposit account - 90
Total - 90	Total - 100

Bank-2 has 90 \$ in the correspondent account, this money came from the correspondent account of Bank-1. However, Bank-2 is able to provide a loan of 81 (90-9) \$. So, the offer of money is 81 \$.

So, let`s say the Bank-2 took the opportunity and transferred 81 \$ as credit to a deposit account of the client of another bank (conditionally Bank-3). As a result, the following changes occur in the balance sheets of participating banks.

The amount of money in the correspondent account of the Bank-2 will decrease by 81 \$ and a new asset will appear equal to this amount - " Issued loans." There is no change in the passive part of the balance sheet. Thus, the amount of the accepted deposit will remain at 90 \$ (Operation-5).

(Operation-5)

Bank-2

Active	Passive
Correspondent account - 0	Checking deposit account - 90

Mandatory reserve amount - 9	
Issued loans - 81	
Total - 90	Total - 100

The correspondent account of Bank-3 received 81 \$ and is reflected in the passive part of the balance sheet as an obligation in the deposit account of the client (Operation-5).

Bank-3 has 81 \$ in the correspondent account, this money came from the correspondent account of Bank-2 (Operation-6). However, Bank-3 has the opportunity to provide a loan of 72.9s \$.
(Operation-6)

Bank-3

Active	Passive
Correspondent account – 72,9	Checking deposit account - 81
Mandatory reserve amount – 8,1	
Total - 81	Total - 81

Let`s say, the Bank-3 took the opportunity and transferred 72.9 \$ as loan to a deposit account of the client of another bank (conditionally Bank-4). As a result, the following changes occur in the balance sheets of participating banks.

(Operation-7)

Bank-3

Active	Passive
Correspondent account - 0	Checking deposit account - 81
Mandatory reserve amount – 8,1	
Issued loans - 72,9	
Total - 81	Total - 81

The amount of money in the correspondent account of bank-3 will decrease by 72.9 \$. A new asset equal to this amount will appear - «Issued loans». There is no change in the passive part of the balance sheet. Thus, the amount of the received deposit will be kept at 81 \$ (Operation 7).

The correspondent account of Bank-4 received 72.9 \$ of money and is reflected in the passive part of the balance sheet as an the deposit account of the client (Operation 8). This bank also has the opportunity to provide a loan in the amount of 65.6 (72.9-7.29) \$. Because in his correspondent account are free funds equal to the amount.

(Operation-8)

Bank-4

Active	Passive
Correspondent account - 72,9	Saving deposit account - 72,9
Total - 72,9	Total - 72,9

Of course, this process can be continued. How much longer can credit transactions carried out by the 4 above banks continue? The answer is one. Banks can issue loans until the balance of free money in bank accounts is zero. A total of 1000 \$ deposits will be created as a result of this process (Table-1).

(Table-1)

Banks	Amount of deposit	Amount of money in correspondent account
1-bank	100	0
2- bank	90	0
3- bank	81	0
4- bank	72,9	72,9
...
Total	1 000	0

As a result of equating money with a deposit, this deposit of 1000 \$ will be accepted as newly created money (offer for money) and included in the money supply in circulation. If these deposits were money, then banks did not stop lending operations, but on the contrary, continued indefinitely and limitlessly, and the size of the money supply in circulation would become spatial figures.

Fortunately, in spite of deposits in banks per 1000 \$, in the absence of money in their correspondent account, banks cannot issue loans. Or in such cases, banks cannot offer money, because there is no money. Not only the provision of loans, but also in the event that banks are faced with the demands of their depositors, when they need to withdraw cash deposits, banks cannot provide them. The reason is obvious, they have no money. The above scientific and practical analyzes serve as a complete basis for concluding that the deposit is not money, but the real money is that which issued by the Central Bank.

The evacuation of processes related to the cash multiplier, the strengthening of another important support used in world banking practice, is questionable. In the above cases, when banks need money, their mandatory reserves are stored in the Central Bank in an absolutely stationary state. In our opinion, in the absence of a cash multiplier, mandatory bank reserve does not play a role in credit policy.

The reader, concerned about the ability of the cash multiplier to increase money, read out our above conclusion and expressed fears that there could be a shortage of money that is dangerous than increased money. Yes, anxiety is very appropriate, but there is a solution. The decision is one - again the issuance of money into circulation by the Central Bank. In the money world, all the ways will eventually go to the Central Bank. That's the beauty of banking.

Based on the above conclusions, we give the following proposals for money aggregates and their use:

1. M100 - amounts of money in correspondent accounts of commercial banks;
2. M0- amounts of cash in the cash desk of commercial banks;

3. M1 - the amount of money in the hands of the population.
4. Abolition of the mandatory reservation norm established by the Central Bank regarding the balance of deposits of commercial banks.

References

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