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The Money Market and Monetary Policy during Economic Transition

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Price stability, robust and sustainable economic growth, full employment and balanced foreign economic relations are the broadest strategic goals of any monetary policy. Although implicitly interrelated with the others,[1] the first goal is particularly important for the Bulgarian economy at the current stage of transition. This strategic goal is inevitably incorporated in the general trends of development of the BNB monetary policy,[2] and the regulated growth of the money supply is identified as a precondition for attaining it. The BNB strives to attain price stability by managing reserves, and consequently managing money supply, using primarily open market operations.

The BNB's attempt to exert influence on the money market, and thus indirectly influencing inflation, is explicable. This is the usual approach applied in developed market economies, where open market operations are the basic monetary policy instrument. Hence, with the gradual development of a government securities market, it is only natural for the BNB to increasingly rely on this instrument, simultaneously abandoning some atypical instruments, introduced as necessitated by transition.[3]

The above described approach is clearly seen in the central bank's intentions: "In 1995 and 1996, money supply will be used as a nominal anchor in financial stabilization. Money supply growth will be controlled through reserve money management, based on a projected change in the money multiplier. At the same time, the BNB will use the relationship between the exchange rate and reserve money, preserving the floating exchange rate of the lev to the US dollar, Deutchemark and Swiss franc."[4] Furthermore: "Open market operations will be the cornerstone of BNB monetary policy. To this end, the BNB portfolio shall contain a sufficient amount and variety of government securities to regulate commercial bank liquidity."[5]

This approach to regulation of money supply in an active money market, and such are the BNB intentions,[6] requires the existence of certain conditions. The BNB should understand and be able to accurately project both money demand and supply. Finally, it should have at its disposal reliable instruments for controlling money supply. These preconditions are necessitated by the fact that where the amount of money in circulation and its price are determined by the market, both sides of the money market are determined by the aggregate activities of various economic agents, each of them led by its own goals and purposes. Households, enterprises and institutions seek money they need for their transactions, cover contingencies, and maintain a portion of their assets in a highly liquid form. The BNB in pursuance of its monetary policy in conjunction with the commercial banks and households determine the money supply which services the economy. Thus, being aware of and able to project the dynamics of both sides of the market, and having the potential to influence it in the long run, will determine monetary policy efficiency.

This paper considers the extent to which the conditions stated above are present. The author concludes that the peculiarities of transition are cause for much uncertainty in the money market, and hence, result in low monetary policy efficiency. Therefore there is a need for improvement in the identification and projection of money market conditions, and the establishment, to the extent possible, of a stable regulatory framework. To successfully pursue its monetary policy, the BNB will have to develop a regulatory framework and operating procedures providing for a high degree of control over changes in the reserve money. Another major conclusion is that reached monetary policy efficiency is highly dependent upon the credibility and stability of the banking system. Although problems of banking supervision, banking system stability, and guarantees on different

[1] *Price stability, in particular, is identified as an underlying strategic goal in the Law on the BNB. In accordance with Article 2, para. 1 of the law, the main task of the Bulgarian National Bank shall be to contribute to the maintenance of the domestic and external stability of the national currency. For this purpose, it shall formulate and implement the national monetary and credit policy and shall contribute to the creation and maintenance of efficient mechanisms of payment.*

[2] *See section "Major Trends in Monetary Policy" in the BNB annual reports for 1991 – 1995.*

[3] *See Filipov, L. Monetary Policy Instruments of the Bulgarian National Bank.* ***Bank Review****, issue 1/1994.*

[4] *1994 Annual Report of the BNB, Major Trends in Monetary Policy in 1995 and 1996, p. 104.*

[5] *As the above, p. 105.*

[6] *See Balyozov, Z. BNB Monetary Policy in 1996,* ***Monthly Bulletin****, issue 2/1996, p. 29.*

types of deposits are traditionally considered separately from the issues of money supply regulation, they are related to monetary policy efficiency. This paper proves the need for monetary policy comprehensiveness in terms of interrelation between money supply regulation and foreign exchange policy.

Money Market Uncertainty

Money in circulation depends on supply and demand. These two elements meet at the market and their interaction determines the interest rate and the money supply required by economic agents. For bringing it to and maintaining it at levels corresponding to its monetary policy targets, the BNB should so control the amount of reserve money, so as to have supply offset demand at a particular level of money supply, corresponding to the Bank's goals. Thus, the BNB target for the money supply will dictate the market until the occurrence of some significant changes in the economic environment disrupts the equilibrium of the market.

Practical problems in relation to the realization of this scheme result from the fact that it is impossible to project money demand with absolute accuracy and that the central bank may only partially influence money supply. The Bank has instruments at its disposal for influencing money supply to a certain extent, but has no full control over it, as this control is the result of the behavior of other economic agents, namely commercial banks and saving individuals. Thus, the actual amount of money in circulation, formed as a result of an equilibrium achieved between supply and demand at a certain level, cannot be determined in advance and may significantly differ from the BNB target.

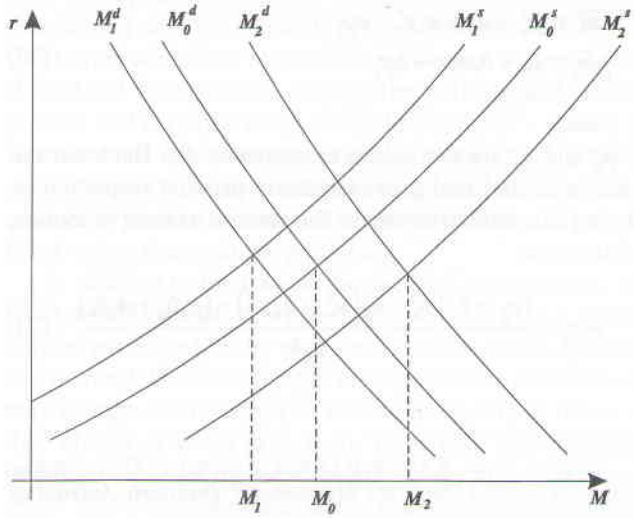
The central bank, in practice, should determine the expected values of the real gross domestic product, the price level, and the elasticity of demand of real equilibrium with the real gross product and the nominal interest rate. In this way, the Bank will also determine the expected money demand. The actual real gross product and price level values will inevitably differ from the Bank's expectations. The difference between the BNB's expectations for money demand and the actual level will vary within limits determined by the accuracy of projections of the real gross domestic product and the price level, and by incidental shocks in money demand.

The situation with money supply is the same. Having determined a particular level of reserve money, the BNB projects a corresponding money supply level. But the actual money supply will not depend only on the value of reserve money, but on the banks' behavior as regards their asset and liability operations, and also on the saving preferences of individuals. The difference we find in practice between the projected and the real supply will depend on how accurate the Bank was in forecasting the behavior of other economic agents, and on possible incidental shocks.

Chart 1 shows a diagram of the uncertainty of the money market, resulting from the uncertainty of both money demand and money supply[7]. Let us assume that the immediate monetary policy target is to maintain the money supply on level M_0 and that the BNB projects the real gross domestic product and the price level. Then, money demand is expected to be shown by the M_0^d, and the Bank should aim at a reserve money level which would generate money supply for which market equilibrium is reached at M_0 – the money supply corresponding to BNB's immediate target. Or figuratively speaking, the Bank should aim to generate a dependence between interest rate and money supply which is expressed by the M_0^s curve. Due to a number of factors beyond BNB's full control, actual demand and supply will in most cases differ from its expectations. Let us assume by analogy that due to an unexpected change in inflation or in the real gross domestic product, actual demand varies within M_1^d and M_2^d. Let us similarly assume that resulting from the activities of commercial banks and saving individuals, money supply varies within M_1^d and M_2^d. Here we arrive at one of the basic problems of monetary policy. The central bank is striving for money equal to M_0, but in practice it has no full control over money supply, and is not able to project money demand accurately. As a result, money supply is determined by the activities of economic agents and the economic environment, and may vary within M_1 and M_2. That is, in the long run it may considerably differ from the Bank's target M_0. In addition, the diagram clearly shows that the interest rate, at which equilibrium is achieved in the money market, may differ considerably from BNB expectations.

Chart 1

Uncertainty of Money Supply and Market Interest Rate



[7] *The horizontal axis shows the amount of nominal balances, and the vertical axis shows the nominal interest rate.*

Formal Analysis of Monetary Policy

The analysis of money market uncertainty can be formalized. Such an approach would provide a strictly analytical basis for decision-making on various monetary policy aspects. It should be the basis of the quantitative analysis of money market characteristics.

Let us express money demand and supply functions in a logarithmic and linear form. This is not the only possible expression, but it is relatively often used in empirical econometric studies[8]. Under this assumption, the money market is characterized by the following system of equations:[9]

$$m_t^d = p_t + a_0 + a_1 y_t - a_2 r_t + \varepsilon_t$$

$$m_t^s = b_0 + b_1 mb_t + b_2 r_t + \xi_t$$

where,

m_t^d, m_t^s are logarithms of money demand and supply respectively;

p_t – logarithm of price level;

y_t – logarithm of real gross domestic product;

r_t – interest rate;

mb_t – logarithm of reserve money;

a_1 – elasticity of money demand to real gross domestic product;

b_1 – elasticity of money supply to reserve money;

a_2, b_2 – sensitivity of demand and supply respectively to interest rate;

ε_t and ξ_t – random values expressing the uncertainty in actions of the economic agents in relation to money demand and money supply respectively.

Let us assume that the monetary policy target for a given period t is related to maintaining money supply at level $\overline{m}_t$. Thus, demand and supply is expressed by the following system of equations:

$$\left| \begin{array}{l} \overline{m}_t = p_t^e + a_0 + a_1 y_t^e - a_2 r_t \\ \overline{m}_t = b_0 + b_1 mb_t + b_2 r_t \end{array} \right. \quad (1),$$

where,

p_t^e and y_t^e are the values expected by the Bank for the price level and real gross domestic product respectively. Having solved the system for the amount of reserve money, we arrive at:

$$mb_t = \frac{(a_2 + b_2)\overline{m}_t - b_2(p_t^e + a_1 y_t^e) - (a_0 b_2 + a_2 b_0)}{a_2 b_1} \quad (2).$$

This is precisely the amount of reserve money the BNB targets in order to be in a position to regulate money supply at the desired level. At the same time, equilibrium at the money market will be set at a money supply level corresponding to the following interrelation:[10]

$$m_t = \frac{a_2 b_1 mb_t + b_2(p_t + a_1 y_t) + a_0 b_2 + a_2 b_0 + b_2 \varepsilon_t + a_2 \xi_t}{a_2 + b_2} \quad (3).$$

The influence exerted by the BNB on the money market is accounted for by replacing the value of reserve money (2) in the obtained dependence of the equilibrium money supply (3). After substitution and transformation, we arrive at the following expression of the money supply at the point of equilibrium:

$$m_t = \overline{m}_t + \frac{b_2(p_t - p_t^e) + b_2 a_1(y_t - y_t^e) + b_2 \varepsilon_t + a_2 \xi_t}{a_2 + b_2}.$$

Here the difference between the actual equilibrium money supply $\mathbf{m}_t$ and at desired by the Bank, $\overline{m}_t$, is explicitly seen. This difference is the result of three conceptually different groups of factors[11]. First, this is the deviation of the price level from the expected value, and the deviation of the actual from the expected real gross domestic product. It is clear in this case that with inaccurate price level and production projections, the Bank would have erroneous expectations, and hence, will not be in a position to adequately project transaction money demand.

The second group consists of factors having exogenous impact on money demand. Changes in the economic environment, such as dramatic changes in the exchange rate or in the credibility of the banking system, may influence both transactional and speculative money demand. Thus money demand is generated which considerably deviates from the Bank's expectations.

The third group of factors has exogenous impact on money supply. Unexpected shifts in the economic environment may influence the behavior of commercial banks and saving individuals, thus changing the money multiplier. In other words, a change in the deposit multiplication process in the banking system is effected.

As a result, the reserve money level maintained by the BNB may differ from the expected money supply.

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[8] *See e.g. Poole, W. Optimal Choice of Monetary Policy Instruments in a Symbol Stochastic Macromodel,* ***Quarterly Journal of Economics****, 84/1970.*

[9] *For more simple designation, all system parameters will be positive figures. In the money demand equation, therefore, there is minus before the ratio of money demand sensitivity to the interest rate.*

[10] *This result is obtained by solving system (1) in terms of the money supply and the interest rate as endogenous values, while other values are treated as exogenous.*

[11] *We intentionally do not discuss here the issue of accuracy of the econometric evaluation of this model's parameters. It is clear that the comparatively short time series as a result of observations on the variables and the significant structural changes within short periods of time cause certain problems. This additionally increases the uncertainty in analyzing and projecting the equilibrium in the money market.*

Monetary Policy Implications

The uncertainty of the monetary policy impact on money market equilibrium will inevitably exist in any market economy. It is inherent in the market mechanism and the opportunity provided to all economic entities to make autonomous decisions. Thus, the problem faced in economic transition is not the existence of uncertainty, but rather the degree of uncertainty. Where the economy is functioning through well developed institutions, on stable financial markets, and with predictable behavior of economic agents, the degree of uncertainty is comparatively small. Where these conditions are nonexistent, as in a period of transition, uncertainty may be quite high, thus jeopardizing the efficiency of the monetary policy. This will have a negative effect on inflation. This problem is illustrated by Chart 2, which shows two provisional situations related to different degrees of uncertainty. In the first, due to insubstantial deviations from the expected behavior of economic agents regarding money supply and demand, uncertainty is low. Consequently, money supply and demand curves approximate the expected demand curve M_0^d and the expected supply curve M_0^s. In the first case, the equilibrium money supply may vary within the interval $M_1 - M_2$. In the second case, the deviation from the expected behavior of economic agents is quite large. This provides the conditions for considerable variation in money supply and demand, causing a high degree of uncertainty on the money market. This is expressed in the diagram by the actual demand and supply curves, which are "far" from the expected. In such a situation, the equilibrium money supply may vary to a greater extent within the "broad" interval $\mathbf{M_3 - M_4}$.

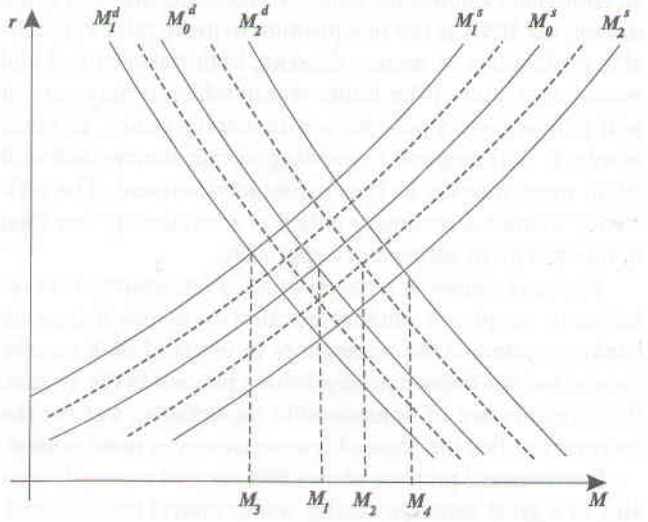
The above situation illustrates some of the basic problems of monetary policy in transition: the high degree of money market uncertainty, the difficulties faced in controlling money supply and consequently the low monetary policy efficiency. In this context, we should discuss the possibilities for diminishing this uncertainty, thus enhancing monetary policy efficiency and facilitating successful anti-inflationary measures.

Conclusions Regarding Monetary Policy in Transition

Comprehensive examination of the limits of possible enhancement of monetary policy efficiency requires a careful analysis of the three sources of uncertainty. The first two are related to money demand – it is a question of the deviation of actual from expected values for real gross domestic product and price level, on the one hand, and of exogenous shocks affecting money demand, on the other. It is clear from the evidence cited that pursuing an efficient monetary policy is impossible without having reliable insight into the size of money demand. Consequently, an important part of

Chart 2

Degree of Money Market Uncertainty



designing the central bank's monetary policy should be related to analyzing and projecting money demand. In this light, it would be appropriate for the BNB to develop a substantial mechanism for analyses, which will allow it to prepare short and long-term projections on the dynamics of the real gross domestic product and the price level. This will enable it to formulate its own authoritative expectations and projections on the transaction money demand.

We should note here that there are two particularly important aspects of projection activities. *First*, it is the central bank, which should make the projection, without taking into account external desires for reaching a particular level of real growth, and without committing itself to any particular preset inflation target. This projection should undoubtedly correspond to the fiscal policy goals, simultaneously considering all other elements of aggregate demand, so that BNB expectations are most realistic. *Second*, the projection should not be restricted only to the real gross domestic product and the price level. It should consist of a variety of combinations between values for real gross domestic product and prices possible at different interest rate levels. Thus, an overall projection curve of money demand will be outlined, rather than a single point on it.

In addition to the transaction demand expectations, the BNB should estimate any possible deviations from it, which may be accounted for by exogenous shocks due to speculative demand. Possible changes in the economic environment may change the behavior of economic agents in terms of their choice of assets to be held. Thus, they may put additional pressure on money demand in one direction or another. This is the possible effect of sharp exchange rate fluctuations, or of changes in the expectations of economic agents concerning inflation and lev depreciation.

The above shows the importance of projecting money demand for the formulation and implementation of mon-

etary policy. Provided the BNB succeeds in adequately identifying possible situations on the money market, it will be able to regulate it into the desired direction, i.e. to pursue an anticipatory monetary policy. At the same time, for some reason, the BNB is not in a position to make relatively reliable projections of money demand, both transactional and speculative, and of the limits within which it may vary, it will pursue only a *post factum* monetary policy. In other words, it will respond to existing circumstances and will adapt more quickly to the current environment. The efficiency of such a monetary policy is considerably less than in the case of an anticipatory approach.

The next source of monetary policy uncertainty is in relation to supply. A current peculiarity of the Bulgarian banking system is the uncertainty in terms of both reserve money and the deposit multiplication process in the system. Both factors are of considerable importance, but for the monetary policy the issue of reserve money is more critical.

International practice shows that reserve money is usually, to a great extent or totally, under central bank control. The situation in Bulgaria is, however, different. Though theoretically the BNB is in a position to influence the amount of reserve money, in practice it does not have, at this stage at least, a high degree of control over it. There are three reasons for this lack of control. The first results from the possibility for commercial banks to maintain a portion of their required reserves in foreign exchange. Consequently, a change in the exchange rate causes respective changes in the reserve money even without intervention by the BNB. This mechanism favors commercial banks. Otherwise, they would have to continuously adjust their reserve requirement level to correspond to the exchange rate fluctuations because a considerable part of their attracted funds are forex denominated. The price paid for this relief to commercial banks is the partial loss of BNB control over reserve money.

The second cause of low control of reserve money is the comparatively easy, at least until recently, access to overdraft given to commercial banks. In this context, recent measures taken by the central bank to harmonize reserve and settlement accounts, as well as the more stringent restrictions imposed upon using the overdraft facility, will result in improved BNB control over reserve money. The final reason is related to the independence of the Bulgarian National Bank. Notwithstanding the text of Article 47 of the Law on the BNB,[12] which provides for independence of the Bank from the government in its decision-making, throughout the whole period of reforms in the banking system to date, in practice, the Bank's independence has never been absolute and was in certain cases infringed upon, mainly in terms of financing the state budget. This had a direct impact on the increase of reserve money and inflation respectively. For these reasons, it would be expedient for the BNB to proceed in its efforts for developing a regulatory framework and practical procedures providing it with monetary policy instruments that would ensure high control over reserve money.

Not insignificant for the uncertainty on the monetary policy influence on money supply is the role of the deposit multiplication process. In the case of the Bulgarian banking system, we should note the specific role played by two factors: confidence in the banking system and the exchange rate. The loss of confidence of economic entities in the banking system, or in individual banks, changes the parameters of deposit multiplication thus affecting money supply. The case with the exchange rate is similar. Its sharp fluctuations change the behavior of saving individuals, and *ceteris paribus*, the money multiplier. Consequently, the exchange rate has an effect on money supply through both reserve money and the money multiplier. In the current phase of transition, the factors of both the banking system credibility and strong exchange rate fluctuations are of particular importance for the monetary policy efficiency. They mark significant differences from developed market economies.

This leads to more important conclusions. *First*, the inefficiency of monetary policy is partly due to reasons which are in practice external to it. Traditional confidence in the banking system, and banking supervision related to it are not elements of the monetary policy.[13] It becomes more and more evident, however, that in economic transition these are of an immediate and decisive importance for its efficiency. This is to say that monetary policy should be viewed in a broader context and that its successful implementation is impossible without coordinated and concomitant measures for strengthening the credibility of the banking system. *Second,* goals of the monetary and the exchange rate policies should be harmonized. The significant effect of exchange rate on money supply affects the equilibrium money stock, which influences, in part, inflation and the exchange rate. Consequently, the targets of the monetary policy for controlling money in circulation, and of the exchange rate policy for maintaining a particular rate of exchange turn out to be interrelated. Because of its great importance, this interrelation between targets should be identified in detail and quantitatively analyzed. Otherwise, the lack of synchronization between targets may result in serious deviations in actual figures from BNB targets for both money supply and exchange rate.

[12] *Law on the Bulgarian National Bank, State Gazette, issue 50 of 1991, amend. issue 32 of 1996.*

[13] *In some countries they are even regulated by two independent institutions.*