



NATIONAL BANK OF SLOVAKIA

**FORMING OF THE MONEY SUPPLY IN SLOVAKIA IN 1993-1997**  
(Part I)

**Ing Zora Komínková, PhD.**

Institute of Monetary and Financial Studies of the NBS  
Bratislava 1998

## *Forming of the Money Supply in Slovakia in 1993-1997 (Part I)*

Money aggregates, used to define various measures of money in the economy, are an important source of information and an essential part of every central bank's toolbox. If monitored systematically, they provide a continuous picture of developments in money supply and play an important role in estimating inflationary pressures. The rate at which the money supply expands lies at the center of standard monetary regulation which, based on a monetaristic interpretation of the quantity equation of money, has evolved into the monetary targeting.

Monetary targeting is built on the assumption that by regulating the growth of money supply - as the intermediate aim of the monetary policy - the central bank is able to steer inflation, or to achieve the desired level of inflation in the economy - as its ultimate monetary goal - in line with its mission to guard the stability of the currency. This approach has been widespread among central banks in advanced countries, particularly in the 1970s. In the meantime, financial innovations and liberalization of financial markets have blurred the once distinct line between "money" and "non-money", or the line between monetary assets and financial assets, making it harder to identify developments in money demand. Since the monetarist interpretation of the quantity equation of money assumes a stable money demand, included in its reciprocal form as the velocity of money circulation, the faint line between the money and financial sectors has shaken the (already delicate) theoretical prerequisite for functional monetary targeting - the constant (or predictable) velocity of money circulation. This, in turn, accounts for largely unconvincing results in monetary targeting (in particular, higher than expected growth of the money aggregate chosen as the intermediate target of the monetary policy), prodding most central banks to abandon the practice.

Meanwhile, the model of monetary policy based on monetary targeting has been adopted by several central banks of transforming countries, mainly those that have followed the German central bank's experience, to devise their new-age monetary policy principles. The reasons they chose this scheme might be found in its relative simplicity and the clear and strict game rules needed to achieve the monetary policy goals. Bargaining for satisfactory results with this approach, the banks probably thought the factors, which have already thrown off the relatively stable money circulation velocity in advanced economies, would not be manifested so intensively: first, their nascent money and financial markets would come out of the transformation at a level of deregulation and liberalization akin to today's advanced countries; second, emerging financial markets in the reforming countries would not produce undue incentives for changes in money demand.

The National Bank of Slovakia (NBS) has also taken on the monetary targeting model, but it is has become considerably more relaxed about adhering to its principles than the ironclad German central bank. The NBS publishes its growth target for M2 money supply in its annual monetary program, however, in the end it is the actual economic situation and drifts in the Slovak crown's exchange rate that matter. This kind of more relaxed understanding of monetary targeting is the legacy of several imperfections (statistical, systemic, microeconomic etc.) of the transformation period, which are either not contemplated in the standard scheme or their importance for managing the monetary policy in this period was underestimated.

No matter how formal the role of money aggregates in the monetary policies of central banks, they offer important information about the development dynamics of the economy's money supply, depending on the behavior of economic entities in money demand. The money balances that households and enterprises hold in financial institutions in various types of

accounts represent the money supply to the economy, or the primary source for lending activities of commercial banks.

For monitoring and operational purposes of the central bank, development of broad money aggregates (usually the M2, M3, or M4) is being observed. In the same time, developments in their component parts - narrow money M1 used to satisfy the transaction function of money, and near-money, or quasi-money, which is geared to store value - are recorded as well. The way the aggregate of the money supply is split between these two sub-aggregates can tell much about the monetary expectations of economic entities - whether they trust in the stability of the currency or, on the contrary, fear inflation pressures. This basic structure of the money supply, in turn, allows the assessment of the quality of primary sources for banks' lending activities from the perspective of the duration of individual deposits.

The money aggregate, defining the country's total volume of money in its economy, lies at the heart of the monetary transmission mechanism. Its formation is the result of interaction between the factors influencing money supply and those which determine money demand. For this reason knowing the trends and structure of the broad-money aggregate is of primary importance for both, successful accomplishment of the central bank's monetary policy targets and a lending policy of commercial banks.

This paper was designed to analyze the money supply in Slovakia in the period from 1993 to 1997, with a special focus on 1997 and, as far as available data allows, on the first quarter of 1998. The paper is divided into three parts, scheduled for publication shortly. The first part is prevalingly a review of developments in money supply seen from the point of view of monetary policy containing empirical experience gathered in monetary targeting in Slovakia. In this part, we are concentrated on the broad-money aggregate M2; only analyzing its major components, M1 and near-money, as reported in the monthly Monetary Survey of the Slovak Republic. The second and third parts go inside the M2 to analyze the time structure of near-money and look at the sectoral structure of M2, identifying the shares of households and enterprises in formation of individual M2 components that - indirectly - reflect the monetary behavior of both sectors. In compiling these parts, we have combined the Monetary Surveys data with consolidated data of the banking statistics of the NBS regarding deposits and loans.

The analysis presented here was conducted with the intention of providing deeper insight into the way the money supply has fared to date in Slovakia and has no forecasting ambitions. In the time series we have used, we have not completely filtered out seasonal and other deviations, which is why the variables and their correlation are bound to contain a certain amount of "hum". The calculations and charts were made using the most simple statistical methods, without sophisticated software or testing techniques. Nevertheless, we believe that, as it stands, the paper renders a fair picture of what has happened in Slovakia's money supply so far, as well as of the developments in the time and sector structures.

## **Money Supply Regulation in Slovakia: Summary**

The importance of the broad money aggregate is given by its central position in the monetary transmission scheme, as it put together the money circle (monetary basis money multiplier money supply) and the real circle (money supply velocity of money circulation nominal output)<sup>1</sup>. In this way, the success of a monetary policy based on monetary targeting (theoretically based on the monetarist assumption of the neutrality of money and on the

---

<sup>1</sup> Or price level times real output.

quantity equation of money<sup>2</sup>) hinges on the stability (predictability) of the money multiplier and velocity of money circulation. With sufficient stability (or knowledge of the trend) in these two variables, the central bank - by regulating the narrowest of all money aggregates (the monetary basis, or the central bank money) - should be able to steer the total supply of money in the economy and, thereby, the level of inflation (at a given rate of growth of real output)

From the experience the NBS has gleaned so far with a monetary policy using the M2 aggregate as the intermediate monetary policy target, we cannot really say there is direct relation between the dynamics in M2 and the rate of inflation in Slovakia's economy: Table 1 shows that, since 1994, the real growth values in both variables have strayed from their programmed targets. In 1994-1996, despite faster than projected M2 growth, inflation slowed down - even dipping below the target set in the monetary program. In 1997, on the contrary, inflation outstripped its target even though the M2 stayed behind expectations. The actual developments in M2 and the annual inflation rate (based on the consumer price index - CPI) are shown in Chart 1 (*tables and charts - see BIATEC Journal*). Our article on the money supply regulation in Slovakia<sup>3</sup> was devoted - among other - to evaluate the quality of the multiplying relation within the money circle of the monetary transmission, i.e. the level of stability of the money multiplier between the monetary basis and the M2 money aggregate. The analysis ended with the conclusion that, in Slovakia, the money multiplier was not all too steady<sup>4</sup>. In line with theoretical assumptions, one of the reasons for differences between the actual and targeted M2 could have been the unstable money multiplier.

Of course, there were other reasons for differences between the targeted and the actual growth of M2 in Slovakia. Of those that have been identified, we can name in particular:

- *Statistical reasons*. Apart from short time series, we need to point out a number of changes in the methodology, and also inadequate knowledge of time delays in interactions between the monetary and the real sectors in conditions of the emerging market environment.
- *Monetary policy systemic reasons*. A fixed exchange rate of the Slovak crown did not allow independent control of internal monetary policy targets. Prior to the adoption of a new foreign exchange act (October 1, 1995), which introduced current-account convertibility of the Slovak crown, this conflict was somewhat dampened by a system of limited (internal) convertibility of the currency. Later, the fluctuation band in which the exchange rate is allowed to float gradually stretched to become today's +/- 7 percent from the central parity.

- *Mechanism related reasons*. Imperfections in the transmission mechanism resulting from a volatile macro- and microeconomic environments.

- *Accommodative character of NBS' monetary policy*. Real GDP has constantly outpaced growth rates the NBS used to devise its monetary programs for individual years (Chart 2). Seeing a decline in inflation, the NBS estimated it could as well foster economic growth by allowing the M2 to grow ahead of target. When compared to the way this is supposed to work in theory, the application of monetary targeting in conditions of the Slovak Republic might lead to a number of theory-vs.-practice questions about the real principles of monetary policy,

---

<sup>2</sup> (M.V = P.Q, where M - the volume of money in circulation, V - velocity of money circulation, P - price level, Q - real output)

<sup>3</sup> KOMINKOVA, Z.: Regulation of the Money Stock and Issues of Monetary Targeting in the Slovak Republic. *Biatec*, 4, 1996, No. 8, p. 15-22.

<sup>4</sup> The value of the money multiplier ranged between 5 and 6, which means that the NBS money (the monetary basis) sometimes allowed the production of a 5-fold, and at other times, of a 6-fold of M2 (op. c., p. 17)

as was the case in several advanced countries in the 1970s (especially the U.S.). Notwithstanding, there is to be stressed the measuring of money supply growth - in the form of the broad money M2 as well as of its individual component parts - furnishes the NBS, just as it would any other central bank, with invaluable feedback on its monetary policy, allowing it to make swift corrections if necessary

This can be best illustrated by the experience Slovakia had in 1996, when M2 growth statistics in the first months of the year suggested a 40% year-end increase. Taking the hint, the NBS adjusted its monetary program in June and, in July and early August, adopted several radical policy measures to check the sheer expansion of money supply<sup>5</sup>. Seen against the situation in early 1996, the end year M2 growth of 16.5% was a very good result. It was achieved by systematic monitoring of the M2, which allowed the NBS to spot the hazards of a growth of destabilizing elements in Slovakia's monetary development. As the NBS pushed ahead with its cautious monetary policy in 1997<sup>6</sup>, the pace of growth of the M2 has flagged, and even fell short of its target at the end of the year.

Studying the factors which decide the achievement of targeted expansion of money supply in Slovakia so far, we have cited several facts that spoke for a more liberal interpretation of the function of M2 as the intermediate target of the NBS' monetary policy. Referring to the analysis featured in the aforementioned paper, we will try to point out some characteristics of the money circulation velocity indicator, which expresses the link between the monetary and real spheres of the economy. Assuming that the NBS makes the correct assessment of expected velocity of money circulation in its monetary program, and given the conditions of the anticipated growth of real output, the projected M2 growth rate should ensure achievement of the inflation target figures.

As Table 1 suggests, the interesting point in the relationship between annual M2 expansion (intermediate target of NBS' monetary policy) and the annual inflation rate (ultimate goal) is that, in spite of M2 growing beyond target range, the NBS has managed to maintain the inflation rate set out in its monetary policy<sup>7</sup>. If we consider the formal relationships involved in the quantity equation, our intuitive conclusion must be that one reason inflation was actually falling in that period, although the money supply grew faster than projected, was that money circulation was slower than expected (and real GDP growth faster than expected). To the contrary, surpassing the inflation target in 1997 indicates an acceleration in M2 velocity higher than expected in the monetary program, or, in practice, the acceleration of the M2 velocity compared with the assumption of an unchanging velocity.

---

<sup>5</sup> In particular, the counter measures were designed to curb lending activities in commercial banks, both in crown and foreign currency denominated loans. The minimum reserves ratio (MRR) was stretched to 9%, or rather the previous two rates (9% in demand deposits and 3% in time deposits) merged into the higher one - 9%; the former MRR applied to building saving deposits was raised from 1 to 3%. A special foreign exchange position was introduced for banks to tighten the conditions for foreign currency loans. The banks were required to meet the initial foreign exchange position ratio (0.65) by December 31, 1996; then, the ratio has grown gradually up to the 0.80 applicable since the middle of 1997.

<sup>6</sup> In addition to measures adopted in the summer of 1996, in early 1997 the NBS resorted to quantitative liquidity control over commercial banks, actually barring their previously automatic access to refinancing resources.

<sup>7</sup> This is the case of the period from 1994 to 1996, when the Slovak economy moved from depression to a rapid growth. A hike in inflation in 1997 (beyond its target) can partly be explained by a delay in the impact of monetary impulses (excessive M2 growth in the previous three years) on the economy (or the division of the nominal GDP growth into the real GDP growth and the inflation rate).

## Income Velocity of M2

With the end of 1997 drawing near, the M2, used to define the aggregate money supply in the Slovak economy, added up to SKK 453.5 billion, some 70 percent of the nominal annual GDP or a nine-fold of the banknotes and coins in circulation. So far, the bond between the growth of M2 and the nominal GDP (Chart 3) during statistical coverage of the 8 years of transformation (1990-1992 under the former Czecho-Slovak Federation, 1993-1997 under the independent Slovakia) suggests that any major changes in the expansion of money supply take about 2 years (or 9 quarters) to translate into fresh growth in nominal GDP. The chart shows a sharp rise of nominal GDP in 1994, which came as a late response to an upsurge in M2 at the beginning of transformation; in the same way that faster growth of nominal GDP in the period from the last quarter of 1995 to the first quarter of 1996 was an echo of dynamic M2 growth in the second half of 1993.

The issue of time lags in transmission of the monetary impulses towards the real economy indicators represents a standard part in preparation the central banks' monetary programs. In stable economies with efficient banking systems, however, the delay is currently around half of that observed in Slovakia (about one year). This is probably why the inconsistency of changes in M2 growth and the inflation rate from year-old levels in Slovakia are also a result of not knowing with any certainty the magnitude of the time delay. Another factor is that the stability of the correlation is described by the velocity of M2 circulation (VM2).

Same from Chart 3, it is obvious that signals sent by a growing M2 have reached the nominal GDP with different force in the first and second part of the period under study, reflecting some erratic behavior of the VM2 indicator (the ratio of nominal GDP and M2). Year-on-year changes in the VM2 (and VM1 for illustration) are shown in Chart 4, which is meant to explain the recorded disparity between the dynamics of M2 and the nominal GDP. A major acceleration of M2 in the last quarter of 1991 was accompanied by a substantial increase in the VM2, resulting in yet sharper growth of nominal GDP. As opposed to that, the stepping up of M2 in 1993 coincided with a slower VM2, which is why the eventual momentum in nominal GDP was largely dampened.

So far, looking at the way interaction between M2 growth rate, nominal GDP, and the velocity of money circulation VM2 has evolved, we still cannot come to any real conclusions. First, the period analyzed is too short; and second, it was marked by a number of shocks - monetary (liberalization of prices, devaluation of the Slovak crown), as well as others (like introduction of the new Slovak currency and the ensuing leak of funds abroad, fueled by devaluation fears, or the complicated process of replacement of the former federal banknotes and coins made in several steps in 1993).

Interpretation of changes in the velocity of circulation will depend on how individual theories explain the apparently simple relationships contained in the quantity equation of money. Without relative limits to the conditions of monetary equilibrium, or assuming equivalent money supply response to changes in the velocity of money circulation, an increase (or decrease) in the velocity of circulation should result in a reduction, or shortage (growth, or surplus) of money supply in the economy.

However, the monetarist interpretation conceived by Milton Friedman, which has become the starting line for monetary targeting, contains the assumption of constant (predictable) velocity of circulation  $V$  - in our case the VM2. Observed deviations from the constant (or from a distinct long-term trend) are faults indicating that money supply growth, the intermediate target with which the central bank sets the volume of money disbursed into the

economy to, ultimately, achieve a certain inflation rate, will turn out to be either excessive or inadequate for the expected rate of growth of real output. In the first case, the implication is inflation; in the second, the result is likely to be deflation or a slowdown in the pace of real output.

Looking at developments in the VM2 from Friedman's point of view, there is to be stressed again that this is a reciprocal interpretation of trends in money demand. His assumption is that, given equilibrium, real money balances,  $M/P$ , are determined by the demand of economic entities for such money balances, a demand that is presumed to be relatively steady<sup>8</sup>. The assumption that the money demand function in constant was rooted in the hypothesis of permanent income, i.e. the fact that people's monetary behavior (consumption and savings) tend to copy long-term income trends, because current disposable income can be fairly erratic<sup>9</sup>.

Econometric estimates of the money demand function in unstable economies and/or in places where statistical background is inadequate are largely unreliable<sup>10</sup>. For this reason, empirical projections of money demand are based on the velocity of money circulation and, in this way, can provide important information about changes in financial behavior of economic entities with an impact on monetary equilibrium.

With the VM2 (VM1) curve falling, this means money demand, as compared to the growth of real GDP, has been rising in Slovakia. This, given the faster than targeted pace of real GDP growth, caused the disinflation process to pass very quickly. Spells of relative and, at times, absolute accelerations of VM2 (VM1), in turn, imply that money demand has been on a relative and, at times, absolute decline; meaning that money supplied to the economy at the targeted rate of M2 has become relatively excessive. However, this is not quite correct; as long as the rate of growth of real output was higher than the value assumed to devise the monetary program, the disinflation process continued in the economy.

To resume, Slovakia's money circulation velocity indicator VM2 (like VM1), theoretically, lacks the stability needed to guarantee the reliable function of the interaction between the intermediate monetary policy target (the M2 growth rate) and the ultimate goal (the annual inflation rate<sup>11</sup>). The trend of recovering dynamics in the VM2, which went into absolute acceleration at the turn of 1997 and 1998 (in case of VM1, a dramatic rebound came in mid-1997 already) tells the tale of a fading demand for money, suggesting possible changes in the

---

<sup>8</sup> This is how Friedman originally constructed his function of money demand for an individual wealth holder:  $M/P = f(y; w; r_m; r_b; r_e; 1/P \times dP/dt; u)$  where  $M/P$  = real money balances;  $y$  = income at constant prices;  $w$  = share of natural physical assets in total wealth;  $r_m$  = expected nominal yield on financial assets;  $r_b$  = expected yield on bonds;  $r_e$  = expected yield on shares;  $1/P \cdot dP/dt$  = expected tempo of price level shifts;  $u$  = any variable other than income, which may influence the effect added to money services. Although he was aware of certain problems entailed in the application of the function to the entire society, Friedman considered them insignificant and went on use the function on a macroeconomic level. [See: FRIEDMAN, M.: A Theoretical Framework for Monetary Analysis; *Journal of Political Economy*, 78, March-April 1970, No. 2; ISA, J.: *Monetarizmus a jeho vplyv na hospodarsku politiku*. Finance a uver, 40, 1990, No 5, Quarterly Supplement No. 2]

<sup>9</sup> The permanent income hypothesis blazed a trail in consumer trend research. It was for this theoretical contribution, as well as for other works in economic research and the money theory, that Friedman was awarded the Nobel Prize in 1976.

<sup>10</sup> As far as we know, the first experiments in this field simulating the conditions in Slovakia can be found in: CARSKY, R. - GAVURA, M.: *Modelovanie funkcie dopytu po peniazoch na Slovensku*. Biatec, 5, 1997, No. 11, p. 15-22; Collective: *Penazna zasoba v SR*. (Selected relationships between money supply and money demand). IMFS NBS. Not published. May 1997.

<sup>11</sup> Let us note that similar contrasts between theoretical assumptions and practical application of monetary targeting have been reported in the Czech Republic, these days the venue of a fairly heated professional debate over whether the Czech National Bank should switch from its current monetary policy to inflation targeting.

monetary environment, which might make it harder for the NBS to achieve its monetary policy targets in 1998.

The major tendency towards lower money demand, implied from slower money circulation, brings some major shifts in the structure of the money supply M2, betraying certain new elements in the behavior of economic entities. We will deal with those elements in greater detail in the following parts of this paper. But first we are going to show how the money supply in Slovakia has developed at the aggregate level of M2.

## **Development of M2 disaggregated in M1 and Quasi-money**

The total money supply in the Slovak economy is defined by the broad money aggregate M2, which is the sum of crown notes and coins in circulation plus demand deposits (M1) and crown time deposits - including savings deposits, building savings deposits and deposit certificates - plus foreign currency deposits (sub-aggregate quasi-money, QM).

The main development trends of the monetary aggregate M2 in Slovakia during 1993-1997 are shown in Charts 5 and 6: the determining M2 growth element was quasi-money (QM). As a result of the QM growth (index 266) and M1 growth (index 148), the M2 grew by an index of 206, over the entire monitored period. This means that roughly two-fold growth of the total money supply M2 was caused by 2.5-fold increase of the volume of quasi-money, while the volume of M1 has increased by less than one-half. This also led to changes in the structure of M2 (Table 2; since 1993, figures as of the end of each year), in which the quasi-money component significantly strengthened (by 14 points).

The liquidity ratio (M1/M2) as a standard measure of available liquidity in the economy has had a constantly declining tendency: it fell from 0.51 as of January 1, 1993, to 0.37 as of the end of 1997<sup>12</sup>. The degree of "dollarisation" (the share of foreign currency deposits in M2, CM/M2) has remained at a relatively stable level of about 10 percent.

A decisive role in a changed structure of M2 played movements in the proportion between crown demand and time deposits; the share of currency in circulation and deposits in foreign currencies has remained quite stable at 10-11 percent. The growing weight of time deposits in M2 by almost 10 points -- from 43.4 percent (as of December 31, 1993) to 53.0 percent (as of December 31, 1997) has occurred at the expense of demand deposits (that dropped from 35.2 percent to 25.9 percent). At the same time the proportion of currency in circulation and deposits in foreign currencies in the pertinent M2 sub-aggregates has changed: the share of currency in circulation in M1 increased slightly from 28.6 percent to 29.3 percent, while the share of deposits in foreign currencies on QM grew more significantly from 11.9 percent to 16.4 percent. Growth dynamics of the M1 and quasi-money components of M2, including the component parts of both these sub-aggregates, are shown in Figures 7 and 8.

Both components of the quasi-money aggregate - crown time deposits and foreign currency deposits - contributed to its growth. The development of their mutual proportion (Table 3) was primarily influenced by the degree of stability of the monetary environment, as well as the interest rate differential between crown and foreign currency deposits. The decline of the crown time deposits share in 1993-1994 reflected the higher degree of instability of the monetary environment during the first two years of existence of the Slovak Republic, when

---

<sup>12</sup> This level has been close to the level of the European Union countries. However, in view of quality characteristics of money circulation in the Slovak Republic, this comparison is not very fortunate. On the other hand, compared with the Central European countries in transition, there is a clear reciprocal correlation between the size of the liquidity ratio and the degree of dollarization of the economy, which can be explained by the degree of stability of the domestic monetary environment.



inflation expectations and concerns over further depreciation of crown savings disappeared only gradually, after the devaluation of the Slovak crown from 1993. In subsequent years, the interest in further valuation of crown savings by interest yields clearly prevailed, as interest rates on crown deposits have been incomparably higher than on foreign currency deposits.

## **Halfway Summary**

On the basic level of disaggregation, the recent development of the money supply M2 in Slovakia could be interpreted rather positively: the share of the quasi-money in M2 has increased, while the share of M1 has diminished. Following the standard contents of these two components of M2, the share of the less liquid monetary assets in the total money supply has increased, while the share of the highly liquid ones has decreased. This should be taken as an expression of growing confidence of economic entities in the stability of the Slovak currency and of declining inflation expectations.

In light of this, households and businesses have, supposedly, come to prefer savings (including the prudence motive) over the transaction motive for holding money. Neither developments in the relationship between time deposits in crowns and deposits in foreign currencies have affected the assumption of mounting confidence in the stability of the national currency and its improved ability to serve for the a storage of value.

We have found that shifts in the structure of M2 were driven mainly by mirror-like changes in the share in M2 of time and demand deposits. But does the 10 percent by which the share in M2 of time deposits has increased (and the share of demand deposits shrank) over 5 years really mean better quality of the entire money supply, with solid primary deposits allowing safer bank lending operations? There are also other questions to ask: what does this move tell us about the behavior of households and businesses?; was it really a major shift in their reasons for diverting money, from the transaction (consumption) motive towards the savings motive?

Recently, analysis of money circulation velocity showed an evident trend towards lower money demand, which in turn implies that businesses and households may be losing some confidence in money assets as a reliable store of value

In 1997, the M2 structure was affected by turbulences in the Slovak financial market, accompanied by a sharp rise of interbank interest rates. Although this seemed to have supported the trend of a rising share of near-money in M2, the high interest rates that commercial banks have been offering on very short-term funds sparked a major boom of short-term time deposits. That has changed the formal features of the near-money aggregate a great deal: the importance of the transaction motive has gained at the cost of the savings motive behind deposits included in the aggregate.

These shortly sketched observations can only show which way to look for answers to the questions posed above. To find the correct answer, though, one has to delve deeper into developments in the time and sector structures of deposits. It is precisely that sort of in-depth analysis you will find in the next parts of this paper.