

# **MONETARY AGGREGATES, PORTFOLIO SHIFTS, AND MONETARY POLICY**

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## **Abstract**

Attempts, to create or to separate monetary aggregates so that those aggregates will contain all components or elements, which have the strongest relevance to finance economic activity, will lead to a so called relevant monetary aggregate. A relevant monetary aggregate contains all very liquid components or elements which neither immediately could be used for economic expenditures, nor which could be mobilized in a very short time and without much effort for such expenditure purposes. Such a relevant monetary aggregate is used to give monetary policy early information about economic activities and inflation developments. The fact that monetary policy often uses at least three monetary aggregates, namely M1, M2 or M3, shows that there is no general agreement, which monetary components show that strong relevance for expenditure purposes.

It has to be added that beside the liquid components of the broad monetary aggregate M3 there exist several other so called near-money assets, which absolutely could be mobilized in a very short time for expenditure purposes too. On the other hand it could be shown that even the very liquid components of the official M-aggregates sometimes are not used for expenditure purposes. This is so, because holding of very liquid components which belong to the M-aggregates could be a rational result of portfolio shifts. It is shown that it is not easy to estimate the amount of such portfolio shifts, which reduce the information content of the common M-aggregates. So it is an interesting question, if there exist alternative monetary aggregates, which could separate the one part of each monetary component which is used for expenditure purposes from the other part, which is used for portfolio reasons. Examples for such monetary aggregates are among others the so called cash equivalent aggregate and the divisia aggregate. But these interest-weighted money supply aggregates too have problems to identify portfolio shifts.

The result of the paper is that monetary policy should not concentrate on only one monetary aggregate. Rather it should be based on a broad monetary analysis to estimate inflationary risks.

## **1. Functional Definition of Money**

Today it is widely accepted in economics that there is no explicit, generally binding and no valid definition in the long run. Instead the term of money is defined on a functional basis. Accordingly, things or goods are counted for money which fulfil the specific functions of money. In general, three monetary functions can be distinguished - money acts as a general accepted medium of exchange, a store of purchasing power, and a unit of account.

The function as a general accepted medium of exchange implies, that money should not act only as a general accepted return service in the exchange process of goods. It should also act as a general accepted means of removing debt which enables temporary transfer of purchasing power from the creditor to the debtor. Money as a means of storage enables the transfer of purchasing power to the future. The means of payment is assured and possible in the near future. The exchange value or its purchasing power is assured not only today, but also in the nearer future. Money as a unit of account attributes a single and exact value to goods and services what means that money should act as a value of measure.

On the whole, it is possible to reduce the monetary functions on only one central function – money as a means of payment. Money shall not only be accepted as a means of payment today, but also as a means of payment tomorrow. That means that money shall also act as a store of purchasing power. Finally, money shall further act as a measure of value. Attempts to create or to separate monetary aggregates which fulfil the function as a means of payment in this general sense, will lead to a so called relevant monetary aggregate.

## **2. The relevant monetary aggregate**

The relevant monetary aggregate contains all monetary components, which have the strongest relevance to finance economic activity. That means a relevant monetary aggregate contains all components or elements which either immediately could be used for economic expenditures, or which could be mobilized in a very short time and without much effort for such expenditure purposes. The latter ones are so called near money assets. Due to the very fast possibilities of mobilization there are almost as liquid as components which are immediately used for economic expenditures. Insofar one may describe the components of the relevant monetary aggregate as assets with a very high degree of liquidity.

The analysis of a relevant monetary aggregate provides an informative basis about the achievement of the primary goal of price stability. A very high increase of the relevant monetary aggregate implies that economic agents are able to finance expenditures which are potentially too high. This could take the demand under pressure and therefore endanger the goal of price stability. However, if the development of the relevant monetary is moderate, the pressure on demand and on prices should be rather small.

From a theoretical perspective, the described relevant monetary aggregate should be able to provide early information about economic activities and inflation developments. (see Issing, 2007, p. 14) Insofar, it is a perfect monetary sub-ordinate

target or a perfect indicator for monetary policy. But it should be noted that there is no general agreement which monetary components show that relevance for expenditure purposes. So monetary policy uses at least three monetary aggregates, namely M1, M2 and M3.

### **3. The relevance of monetary aggregates**

The following considerations about the relevance of different monetary aggregates correspond to the separation of the Eurosystem. (see ECB, 1999, pp. 29 ff.; ECB, 2004a, pp. 36 ff.) This basis is chosen not only due to actuality but also as a result of different composition of monetary aggregates. It can be shown that the relevant monetary aggregate M3 of the Deutsche Bundesbank (currency in circulation, overnight deposits, deposits with an agreed maturity of up to two years and deposits redeemable at notice of up to three months), which was used until the end of 1998, is unequal to the monetary aggregate M3 of the Eurosystem. It can be rather compared to the monetary aggregate M2 of the Eurosystem. In general, the monetary aggregates of the Eurosystem contain the whole currency in circulation as well as outstanding amounts of certain liabilities of the monetary financial institutions (MFIs) with their seat in the euro area that are held by non-MFI euro area residents outside the central government sector. In the Eurosystem, there is a narrow monetary aggregate M1, an intermediate monetary aggregate M2 and a broad monetary aggregate M3.

The relevance of the aggregate M1 that comprises currency in circulation and overnight deposits of non-MFIs at the MFIs is beyond dispute. Both components can be used immediately for economic purposes. Due to the fact that the currency in circulation is accounted as a whole (it is not differentiated between the currency in circulation in the euro area and outside the euro area), an increase does not necessarily point to a potential higher economic activity in the euro area. This is for example the case if the increase of the currency of circulation is outside the euro area. The ECB estimates the currency of circulation outside the euro area of about 10 % to 20 %. But the ECB also points out that there is actual no evidence for a clearly faster increase of the currency of circulation outside the euro area compared to the growth of the one in the euro area. (see ECB, 2006b, p. 61)

The monetary aggregate M2 comprises the monetary components of M1 as well as deposits with an agreed maturity of up to and including two years or redeemable at a period of notice of up to and including three months. The relevance of short-term time deposits can be shown in different ways. Short-term time deposits are temporarily put out at interest to make a bigger transaction in the future. They are also relevant due to the fact that continuously claims become due (considered at an aggregate basis) and so they can be used for economic expenditures. These monetary components can be even mobilised earlier by paying a fee.

The short-term saving deposits are also relevant of economic purposes. It is possible to get a certain amount within one month without any restrictions. On the other hand, there is also the possibility to get higher amounts, but some restrictions may apply. The result is that both deposits are very liquid assets that can be mobilised for economic expenditures in a very short time.

The monetary aggregate M3 comprises the monetary components of M2 as well as "... certain marketable instruments issued by the resident MFI sector. These marketable instruments are repurchase agreements, money market fund shares/units and debt securities with a maturity of up to and including two years (including money market paper). A high degree of liquidity and price certainty make these instruments close substitutes for deposits." (ECB, 2004a, p. 37) Due to the possibility to trade these instruments, the degree of liquidity may be even higher than that of short-term time deposits and short-term saving deposits. There are also no restrictions. So these components must have the same or even higher relevance for financing economic activity.

The fact that the Eurosystem has a quantitative reference value for the monetary aggregate M3 (see ECB, 2004a, pp. 64 ff.) leads to the result that the relevant monetary aggregate of the Eurosystem is M3. But the question is if this broad monetary aggregate really contains all components which are relevant to finance economic expenditures.

#### **4. Relevant monetary components outside the monetary aggregate M3**

The question, if the monetary aggregate M3 contains all components which have the strongest relevance to finance economic activity, arises if new kinds of investment appear (financial innovations). These can develop to a narrow substitute to other components which are contained in the monetary aggregate. Such substitutions can affect the assertion of M3 adversely. (see Issing, 2007, p. 15)

The use of marketable instruments which are contained in the monetary aggregate M3 was increasing in the last 10 to 15 years. That's one main cause why the monetary aggregate M3 of the Eurosystem differs from that of the Deutsche Bundesbank, which was created without such marketable instruments. Due to the dynamics it is necessary to check the creation or separation of the monetary aggregates continuously.

In the future the development of the so called electronic money (see ECB, 2000, pp. 49 ff.; Görgens, Ruckriegel, Seitz, 2004, pp. 207 ff.) could lead to a new relevant monetary component and thereby to an enlargement of the monetary aggregate M3. In this context Issing points out that it is characteristic for transactions with electronic money that it is not necessary to use banking accounts. (see Issing, 2007, p. 4)

Already existent are investment opportunities which are held by non-MFIs of the euro area at MFIs outside the euro area that are similar to components of the monetary aggregate M3. These are for example overnight deposits or short term time deposits which are denominated in Euro but are held at MFIs outside the euro area. These components can be mobilised as fast as components at MFIs inside the euro area and therewith used for economic expenditures as well as components which are held at MFIs inside the euro area. That's why the Deutsche Bundesbank additionally considered an enlarged monetary aggregate M3 which also contained holdings by German residents of liquid assets denominated in D-Mark which were held outside Germany (especially in Luxembourg). (see Deutsche Bundesbank, 1995, pp. 72 ff.)

The monetary aggregate M3 also includes holdings by euro area residents of liquid assets denominated in foreign currencies if they are held at MFIs located in the euro

area. These are considered because they can be close substitutes for euro-denominated assets in the monetary union. (see Issing, 2007, p. 12) If short term euro-denominated assets and short-term assets denominated in foreign currencies in the same monetary union have a quite similar degree of liquidity, the same must be true for euro-denominated assets outside the monetary union as well as for asset denominated in foreign currencies outside the monetary union due to the possible substitution. That means that these are also relevant for the financing of economic activity within the monetary union. The assets denominated in foreign currencies outside the euro area could be mobilised as fast as euro-denominated assets outside the euro area. But it has to be added that the exact amount is unsure in a regime of flexible exchange rates.

Furthermore, there are other close substitutes for components that are contained in the monetary aggregate M3. These for example credits of non-MFIs at non-MFIs. It is possible to buy a short-term debt security from a private company (so called commercial papers) or to purchase short-term debt securities by governments instead of short-term MFI debt securities, which are contained in the monetary aggregate M3. The ECB pointed out a close substitution between short-term MFI debt securities and short-term debt securities by governments because of the contrary development: “Consequently, investors in short-term government debt securities have sought alternative assets and may have switched (back) to short-term MFI debt securities, which are a close proxy for short-term government debt.” (ECB, 2007b, pp. 16 f.) Both components have the same degree of liquidity if the same maturity is considered. That means that both can be mobilised for economic expenditures in the same time. By considering particular assumptions (for example big, famous and international companies or governments of big industrial countries) it shouldn't matter if the commercial paper or short-term government debt securities are purchased by residents or by non-residents.

If the financial disintermediation goes further, as can be seen in the last years (see Görgens, Ruckriegel, Seitz, 2004, p. 315) and the private households don't hold their excess liquidity at MFIs, but rather at companies it is possible that more investment opportunities develop outside the MFIs. That means that the spectrum of near-money assets outside the MFI sector, which can be mobilised for economic expenditures in a very short time, can increase.

It is obviously that the spectrum of relevant monetary components outside the monetary aggregate M3 can be enlarged a lot. That means that the creation or separation of a relevant monetary aggregate could be impossible due to the difficulties of statistical measurement. The above discussed relevant monetary components cannot be measured as accurate as present components of M3. Such a relevant monetary aggregate would not be able to act as a monetary indicator or as an intermediate goal, because it must be possible to measure these aggregates exactly, up-to-date and without much effort.

If the relevant monetary aggregate is extended by euro-assets and assets denominated in foreign currencies held by MFIs outside the euro area as well as by claims towards non-MFIs one main attribute of indicators or intermediate goals cannot be fulfilled – the control of the relevant monetary aggregate. But it has to be added that the strong and permanent exceeding of the reference value for the monetary aggregate M3 (see ECB, 2007a, p. 14) cannot be necessarily interpreted as a sign of a lack of control of

the monetary aggregate M3. If one considers extended monetary aggregates the assessment in another one. Assets outside the euro area and claims towards non-MFIs are components outside the field of monetary policy and it is therefore difficult to control them.

The result is that there are many problems by creating or separating monetary aggregates. But it has to be added that also very liquid monetary components which can be mobilised for economic expenditures in a very short time and without much effort are not necessarily transformed into transaction balances. This can be the rational result of portfolio decisions.

## **5. The impact of portfolio decisions on the relevance of the monetary aggregate**

If money is only one part of the portfolio allocation, there are also alternatives. The decision about the optimal structure of the portfolio is simultaneous to the decision about money demand. The basics go back to the considerations of for example Pigou and Marshall in the context of the cash management approach of the quantity theory. These thoughts were in part picked up by Keynes with the analysis of the speculative demand for money and finally by Milton Friedman with the concept of the neo quantity theory money demand. Portfolio decisions, that means decisions about the optimal structure of the aggregate property, may lead to the fact that the property is possibly only temporary shifted towards more liquid components or towards longer-terms components. The determinants for this decision are considerations about the yield as well as the attitude towards risk and the assessment of the risk.

The problem is to identify and to quantify those in particular temporary portfolio shifts. The importance results from the fact that for example an increase of the monetary aggregate M3 due to a temporary increase of the risk aversion and a therewith connected increased preference for liquidity is not an absolute evidence for a forthcoming increased economic activity (see Issing, 2007, p. 16). The increased monetary aggregate is rather a sign of an increased seek for certainty. This shows that monetary components with a high relevance for financing economic activity do not necessarily prove this relevance by being used for financing.

The relevant monetary components are not necessarily so called transaction demand for money. It is also possible that the liquidity is used for portfolio reasons. This could be a precautionary demand for money. That means that liquid assets are used to tide over a period of uncertainty, but are not used for transaction purposes. This would change the information content of the monetary aggregate. The amount of possible transactions would be exceeded. If one could quantify the amount of such portfolio shifts exactly the distortion of the information content could be reduced. (see Issing, 2007, p. 16)

The strong growth of the monetary aggregate M3 between 2001 and the first half of 2003 was explained by the ECB with such portfolio shifts due to the heightened geopolitical, economic and especially financial uncertainties. (see ECB, 2006a, p. 28) These uncertainties arose from a series of shocks to the world economy, like the fall in equity prices, the terrorist attacks at 11 September 2001 and the therewith connected spreading fear for terrorism, several accounting scandals in the USA and in Europe as a result of the substantial fall in equity prices as well as the wars in

Afghanistan since autumn 2001 and in Iraq since spring 2003. “Seeking a ‘safe haven’ for savings in the face of these shocks, the money-holding sector (...) shifted their wealth portfolios from risky and longer-term assets into safe and liquid monetary assets, thus raising monetary growth.” (ECB, 2006a, p. 28) By taking a detailed look at these portfolio shifts this was a shift from equities into debt securities with a maturity of up to two years and money market fund shares/units which are contained in the monetary aggregate M3. The amount was estimated by the ECB of being in a range of €180 billion to €250 billion. (see ECB, 2003, p. 12) But it has to be mentioned that these estimates were marked by a large degree of uncertainty. In the judgment of the ECB this strong growth of the monetary aggregate M3 “... appears to reflect changes in portfolio allocation behaviour and can be seen as relatively benign in terms of the outlook for price developments” (ECB, 2006a, p. 31).

But increased monetary aggregates due to portfolio shifts are benign with regard to outlook for price stability only in two cases: if money holders shift their liquid assets into longer-term ones (what means that they normalise their portfolio allocation behaviour) or if there are signs for a permanent increase in the preference for liquidity or signs for a permanent increase in the risk aversion. (see ECB, 2004b, p. 56). Otherwise, there is the danger that the increased liquidity is used for transaction purposes. This could lead to higher spending and hence higher inflationary pressure.

If monetary aggregates are created very broadly (for example if marketable instruments are included), the information content of monetary aggregates can be distorted due to portfolio shifts. Such marketable instruments are for example short-term debt securities of the MFIs and the money market fund shares within the framework of the monetary aggregate M3 of the Eurosystem. They have two attributes. On the one side they have money quality because they can be mobilised for economic expenditures in a very short time. On the other side they can be used as an asset because they can act as an investment. The problem is to identify which attribute is the relevant one.

The following quotation of the ECB describes the difficulties which arise by solving the identification problem: “The identification, and in particular the quantification, of portfolio shifts is complicated by the fact that there is no direct evidence available. Financial aggregates encompass a variety of individual transactions, which reflect different portfolio allocation strategies; therefore, it is not easy to single out an exclusive relationship between the two macro aggregates. Moreover, in a dynamic economy where the flows of financing and financial investment is constantly growing over time, it is not simple to disentangle the change in the holdings of financial instruments which is due to portfolio reallocation from the trend increase in financial investment in the economy. Finally, portfolio changes due to speculative or precautionary behaviour cannot be readily separated from changes in the holdings of money related to transaction motives.” (ECB, 2003, p. 11)

There is no convincing concept to solve the identification problem yet. That’s why the extent of the distortion of the information content of a monetary aggregate due to portfolio shifts can be considered and interpreted only in tendency. That means that the impact of portfolio shifts on the relevance of monetary aggregates makes uncertain a central requirement on a monetary indicator or a monetary intermediate

goal – a narrow connection between the indicator or the intermediate target and the primary goal of monetary policy, price stability.

It has to be checked if the methodology of the creation of the monetary aggregate M3 also contributes to this problem. In the monetary aggregates M all monetary components are included with the constant weight of 100 percent. There are also other monetary aggregates which include the particular components with variable weights. These variable weights shall lead to a separation of the one part of each monetary component which is used for expenditure purposes from the other part, which is used for portfolio reasons. Those monetary aggregates are described in the following part of the paper. Furthermore, it is intended to give a short assessment in the context of their attributes as an indicator.

## 6. Alternative definitions of monetary aggregates in relation to the monetary aggregate M3

Monetary aggregates, which consider the particular monetary components with a variable weight are the cash equivalent aggregate and the divisia aggregate. (see Issing, Tödter, Hermann, Reimers, 1993, pp. 1 ff.) Both try to determine the different degrees of liquidity of the monetary components and therewith the component which is used for expenditure purposes. The principle is the following: The higher the yield of the monetary component (specific interest), the lower is the part of the component which is used for expenditure purposes and the higher is the part of this component, which is used for portfolio reasons. The difference between the higher yield of a non-monetary asset (for example the currency yield) and the yield of a monetary component is calculated. The yield difference is the price of the degree of liquidity of this monetary component. (see Issing, Tödter; Herrmann, Reimers, 1993, p. 8) The higher the price of these liquidity attributes, the lower is the specific interest of the monetary component, the higher is the degree of liquidity of this component and the higher is the 'monetary part' of this component.

The cash equivalent aggregate can be described by the following equation:

$$B_t = \sum_{i=1}^L S_{it}^* M_{it} \quad \text{with } S_{it}^* = (R_t - R_{it}) / R_t$$

$M_{it}$  is the nominal amount of the monetary component  $i$  at the time  $t$ ;  $S_{it}^*$  is the weight for the monetary component  $i$  at the time  $t$ ;  $R_t$  is the (maximum) yield of a non-monetary asset (for example the currency yield) at the time  $t$  and  $R_{it}$  is the yield of the monetary component  $i$  at the time  $t$ . For example the currency of circulation has the yield of  $R_{it} = 0\%$ . This implies a weight for currency of circulation in the cash equivalent aggregate of  $S_{it}^* = 1$ . Is the yield of the monetary component equal to the yield of the non-monetary asset ( $R_{it} = R_t$ ), the weight of this component is  $S_{it}^* = 0$ . That means that this component has no monetary quality. It is rather used for portfolio reasons and is therefore not considered in the cash equivalent aggregate. If the yield of the monetary component is half of the yield of the non-monetary asset, the weight is 0,5.

In comparison to the cash equivalent aggregate, which connects the single monetary components additive, the divisia aggregate connects the single monetary components

multiplicative. The weights are also variable. The divisia aggregate can be described by the following equation:

$$D_t = D_{t-1} \prod_{i=1}^L \left( \frac{M_{it}}{M_{i,t-1}} \right)^{\bar{H}_{it}}$$

With the exponent

$$\bar{H}_{it} = (H_{it} + H_{i,t-1}) : 2,$$

whereas

$$H_{it} = \frac{S_{it} \cdot M_{it}}{\sum_{i=1}^L S_{it} \cdot M_{it}}$$

and

$$S_{it} = \frac{R_t - R_{it}}{1 + R_t}.$$

The expression  $S_{it}$  shows that the divisia aggregate also determines the degree of liquidity by calculating the difference between the yield of a non-monetary asset ( $R_t$ ) and the yield of the monetary component ( $R_{it}$ ).

If one compares both aggregates with the monetary aggregate M3 it has to be pointed out that the cash equivalent aggregate has the same disadvantage as the monetary aggregates M: the additive connection of the single monetary components implies that there is a perfect substitution between the single components (see Vollmer, 1995, p. 162). But this assumption is not realistic since rational money holders would only hold the monetary components with the highest yield. (see Tödter, 1994, p. 332) By connecting the monetary components multiplicative this perfect substitution is excluded because no monetary component can be perfectly substituted by another. (see Vollmer, 1995, p. 162)

On the other side, the cash equivalent aggregate has an advantage in comparison to the other aggregates. It is possible to include new monetary components (financial innovations) without a new creation or separation of the aggregate because these components had previously a weight of zero. If new monetary components are included in the divisia aggregate or in the monetary aggregate M3, a new creation or separation of the monetary aggregate is required. It is necessary to consider the question of the choice of relevant monetary components in the divisia aggregate and in the monetary aggregate M3. (see Issing, Tödter, Herrmann, Reimers, 1993, p. 10; Vollmer, 1995, p. 168) The new creation or separation of a relevant monetary aggregate has also the problem that there are no long time series to check the connection between the primary goal and the monetary aggregate.

A big disadvantage of the divisia aggregate and the cash equivalent aggregate in comparison to the monetary aggregate M3 appears if the term structure flattens or becomes inverse. If there is an approximation of the yield of the monetary component and the yield of the non-monetary component, the weight of this component tends to zero. That means that it is irrelevant how strong the growth of this component is – the contribution of this component to monetary expansion is very small. (see Issing, Tödter, Herrmann, Reimers, 1993, p. 11) In the case of an inverse term structure, the yield of the monetary component exceeds the yield of the non-monetary component. This implies a negative contribution of these monetary components. That means that the growth of the liquid monetary components would signal a decrease of the monetary expansion. It is obviously that the determination of the degree of liquidity by calculating simple interest differences is not sufficient. Rather a more exact and a more differentiated consideration is necessary. (see Reischle, 1997, pp. 470 ff.)

Considering the methodology of the determination of the cash equivalent aggregate and the divisia aggregate it becomes clear that the interest-weighted aggregates have no advantages identifying the consequences of portfolio shifts. The interest-weighted monetary aggregates also show the above described distortion of the information content which was already considered by the monetary aggregate M3. The variable weights in the monetary components cannot identify if the increase of monetary components due to portfolio shifts is relevant or irrelevant for spending and for the development of inflation.

If the increase of monetary components due to portfolio shifts has no consequences for the development of inflation the weight of these components has to decrease within the framework of the cash equivalent aggregates and the divisia aggregates. The decreased weights would show that the portfolio shift is due to uncertainty and that there is no intention to use this liquidity for transaction purposes. But this automatism cannot be shown. These portfolio shifts lead to the same increase of the monetary aggregates as can be seen by considering the monetary aggregate M3. By considering the portfolio shift to more liquid components the increase of the monetary aggregate is even higher, if the yield of monetary components decreases and the yield of the non-monetary assets increases. In this case the weights of the monetary components increase and the information content is distorted further. It is obviously that the identification problem is the same considering the interest-weighted aggregates and the monetary aggregate M3.

On the whole, the divisia aggregate is no better monetary indicator or monetary intermediate goal than the monetary aggregate M3. Maybe that there are advantages within the scope of the aggregation. It is also advantageous that it is tried to separate the one part of each monetary component which is used for expenditure purposes from the other part which is used for portfolio reasons. But the divisia aggregate is disadvantageous considering the exact, up-to-time measurement and the effort of the measurement. (see Vollmer, 1995, p. 167) It is also difficult to communicate the divisia aggregate to the public. The monetary aggregate M3 and the divisia aggregate have also both similar problems concerning the choice of the relevant monetary components and the distortion of the information content. That's why it cannot be a recommendation to exchange the monetary aggregate M3 towards the divisia aggregate. The conclusions must be in another way.

## 7. Conclusions

As is shown in the previous considerations there is no doubt that it is very interesting for monetary policy and for the public to estimate how much economic activity can be financed in a monetary union without leading to a too high increase of aggregate demand and thereby endanger the purchasing power of the currency. Since it is the primary goal for European monetary policy to achieve price stability it is even an obligation for the European monetary policy to act against inflationary pressure. It is necessary to detect sources of inflationary pressure early and reliable. Due to the fact that economic transactions are dealt with currency it is obvious that all components should be considered which can be used for economic expenditures and which can be mobilized in a very short time and without much effort for such expenditure purposes.

The central function of money is to act as a means of payment. Attempts to create a monetary aggregate which contains all components that accomplish this function lead to the relevant monetary aggregate. The preceding considerations show that it is impossible from a practical perspective to create a single monetary aggregate that contains all elements which can immediately be used for economic expenditures or which can be mobilized in a very short time. The problem is not only the statistical measurement, but also the control of these aggregates.

Another problem is that the relevant monetary components are not inevitably used for economic expenditures. Due to the portfolio allocation behaviour of money holders it may be rational to hold money without being transformed into transaction purposes. The result is the so called identification problem of the creation of monetary aggregates. That means the separation of the one part of each monetary component which is used for expenditure purposes from the other part which is used for portfolio reasons. The result of these considerations was that monetary policy should not concentrate on only one monetary aggregate. It was shown that interest –weighted money supply aggregates have also problems to identify these particular parts of each monetary component.

The result that monetary policy should not concentrate on only one monetary aggregate does neither mean that one need not think about the creation or separation of monetary aggregates nor that the analysis of the monetary development is not necessary. Monetary policy should be rather based on a broad monetary analysis which considers a wide set of monetary aggregates. In this context the change of the two pillars of the monetary strategy of the Eurosystem in May 2003 can be emphasized. This change was more than a gradual change of the strategy. In the former strategy the monetary aggregate M3 was stressed by considering the reference value. After the change this was replaced by a broad analysis of monetary trends. This analysis does not consider only one monetary aggregate. It rather includes different monetary aggregates and their main components, the main counterparts, especially the development of loans as well as financial flows and asset prices. (see Ruckriegel, Seitz, 2007, p. 15) The simultaneous analysis of different monetary aggregates facilitates the assessment of the monetary expansion. There were two periods of a significant monetary growth in the Eurosystem. The first period was between 2001 and mid-2003 and the second period from mid 2004 until today. The first period was accompanied by a decline in the annual rate of growth of loans to the private sector. In contrast to that development, the second period has been characterised by a

strengthening of the growth in loans to the private sector. To get an accurate assessment of the inflationary pressure connected with a strong monetary growth, information from other monetary aggregates are very important. (see ECB, 2006a, pp. 29 ff.) A strong monetary expansion associated with credit growth implies a higher risk of inflationary pressure than a monetary expansion together with a decline in the growth of loans.

It can be pointed out that the monetary policy, as well as other parts of economic policy, analyses dangers for their primary objective not only on the basis of one variable. So, for example, the labour market cannot be analysed by considering only the unemployment rate. An analysis of fiscal policy is not possible only on the basis of the budget balance. Recommendations for economic measures cannot solely be rested upon the real growth.

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