

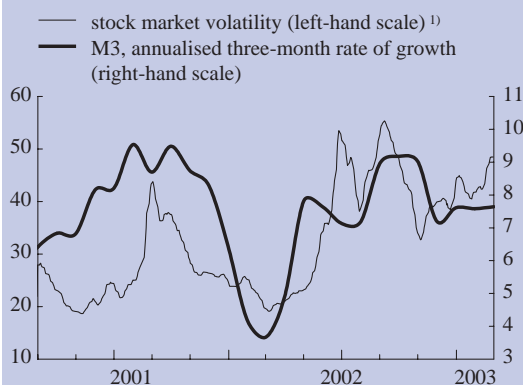
Box I

Estimating the size of portfolio shifts from equity to money

Since the second half of 2001, M3 has been growing strongly. This development seems to have been largely caused by sizeable portfolio shifts from equity to money. As a reaction to the high degree of financial market uncertainty during this period, private economic agents have restructured their portfolios in order to increase the share of safe and liquid assets (see Chart A).

Chart A: Implied stock market volatility and short-term dynamics of M3

(in percentages)



Sources: ECB and Bloomberg.

1) The implied volatility series reflects the expected standard deviation of percentage stock price changes over a period of up to three months, as implied in the prices of options on stock price indices. The equity index to which the implied volatility refers is the Dow Jones EURO STOXX 50.

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 two macro aggregates. Moreover, in a dynamic economy where the flows of financing and financial investment are 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.

Nevertheless, this box attempts to derive a rough approximation of the size of portfolio shifts by putting together information from various statistics, such as money and banking statistics, flow of funds statistics and balance of payment statistics, and combining it with the results of some model-based tools.

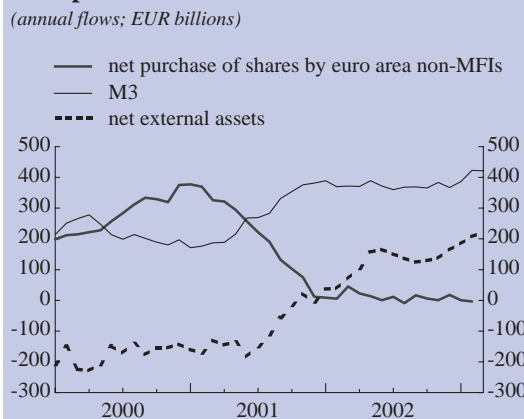
Stylised facts from the analysis of financial flows

Chart B shows a tentative estimate of the net purchase of equity by euro area non-MFIs¹ in comparison with M3 developments. It gives an indication of the close link between these two variables in the last few years. In

1 No direct data exist on equity held by non-MFIs in the euro area on a monthly basis. An estimation has therefore been derived from a combination of different statistics: balance of payments, MFI balance sheets and the Thomson Financial IFR Platinum database. This means that the result of this exercise must be interpreted with caution. Shares held by non-MFIs is derived from the total issuance of domestic shares by domestic sectors less the purchase of shares by banks and non-residents, plus foreign shares held by euro area non-MFIs. It should be noted that an increase in equity held by non-MFIs has no impact on money holdings if these shares have been newly issued by non-MFIs.

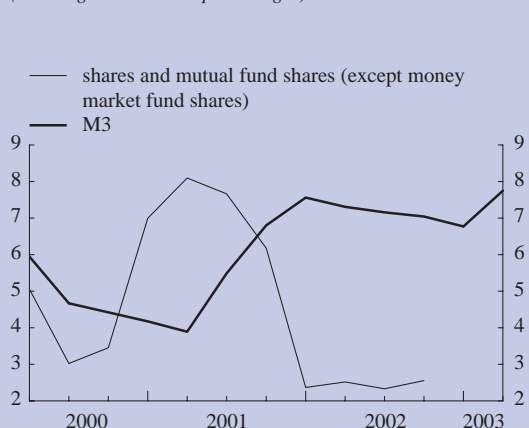
particular, it seems to confirm the hypothesis of strong portfolio shifts out of equity and into M3 since spring 2001. Balance of payments data suggest that these portfolio shifts were mostly related to a significant decrease in the net purchase of foreign shares by non-MFIs. This trend is mirrored by the exceptional increase in the net external assets of the MFI sector since the second half of 2001. The two trends are closely linked since changes in the net external assets of the MFI sector mirror the settling of mainly financial transactions by non-MFIs with residents of non-euro area countries.² These substitution effects are also reflected in the strong decline in the annual growth of quoted shares and mutual fund shares (except money market fund shares) held by the non-financial sector (see Chart C and, for more details, Box 1 on page 9 of the Monthly Bulletin of March 2003). Developments in the components of M3 confirm this analysis. Money market fund shares/units, which are often used to park funds, have increased particularly strongly over the past two years. All these observations of financial flows, while not sufficient to quantify portfolio shifts into M3, are strongly suggestive of substantial shifts from equity to money since spring 2001.

Chart B: Net purchase of shares by euro area non-MFIs against M3 and net external asset position of MFIs
(annual flows; EUR billions)



Source: ECB calculations. Net purchases of shares estimated from IFR Platinum data, MFI balance sheet data and balance of payment data.

Chart C: Financial investment of the non-financial sector
(annual growth rates in percentages)



Source: ECB.

Model-based evidence of the impact of portfolio shifts on M3 developments

Evidence of portfolio shifts can also be gained from money demand models. These models typically do not include stock market variables as explanatory variables for money demand. Thus, if recent developments in money demand cannot be explained by traditional factors (real GDP, prices, interest rates), the unexplained parts of the models might mainly reflect the influence of stock market developments. In fact, the results from money demand models suggest that non-standard factors played a crucial role in the build-up of liquidity in 2001, 2002 and early 2003, as the residuals (e.g. the new unexplained shocks in the most recent quarter) of such models remained positive between 2001 Q2 and 2003 Q1. This was most significant in 2001 Q3 (after 11 September) and 2002 Q4 (at a time of heightened geopolitical uncertainty). Assuming that the positive shocks are solely caused by portfolio shifts and that no other shocks affected money demand, the accumulated shocks between 2001 Q2 and 2003 Q1 suggest that portfolio shifts in this period would amount to around €180 billion. However, these estimates are marked by a large degree of uncertainty, partly due to the assumptions mentioned.

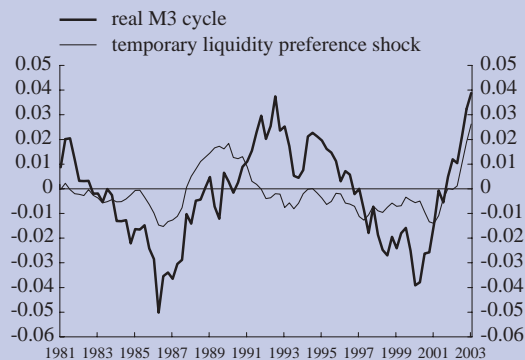
Insights into the importance of portfolio shifts might also be gained by using the structural VAR model of Cassola/Morana³, which analyses the link between several nominal variables (inflation and nominal interest

² For more details, see the Monthly Bulletin of May 2001, page 55.

³ N. Cassola, C. Morana, (2002), "Monetary policy and the stock market in the euro area", ECB Working Paper No. 119.

rates) and real variables (output, real M3 and real stock prices) for the euro area. In this model, the historical decomposition of the cyclical dynamics of the economic variables into the contributions of their underlying determinants seems especially suitable for studying the effect of stock market dynamics on the cyclical dynamics of M3. As shown in Chart D, within the terminology of the model, it is a “liquidity preference shock”, i.e. the temporary shift from equity to money, that dominated the cyclical dynamics of M3 from 2001 to early 2003. In addition, Chart D shows that the contribution of the liquidity preference shock variable to the cyclical behaviour of M3 in past periods was not very significant, except for the periods around the stock market crash in autumn 1987. The model suggests that an increase in M3 of around €230 billion between 2001 Q2 and 2003 Q1 can be attributed to portfolio shifts related to stock market developments. However, as with any model, the results should be treated with caution, as the liquidity preference shock variable in the model may capture elements other than portfolio shifts, and since variables not included in the model might also contain relevant information on portfolio shifts.

Chart D: Real M3 cycle and the contribution of the temporary liquidity preference shock
(in logarithms)



Note: The chart shows the deviation of real M3 from its long-term trend, which can be interpreted as the “real money cycle”. The contribution of “liquidity preference shocks” to this cycle is also plotted, which corresponds to the cyclical deviation explained by a temporary shift from equity into money.

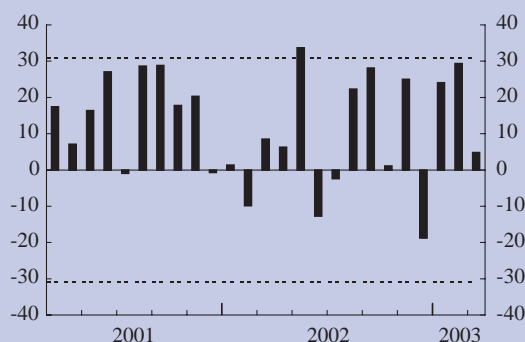
Quantification of portfolio shifts with a time series model

The impact of portfolio shifts on M3 growth can also be roughly quantified with a simple time series model.⁴ Without taking into account portfolio shifts, the one-step-ahead out-of-sample forecast errors of the time series model were basically always positive between spring 2001 and late 2001 as well as in the second half of 2002 and early 2003 (see Chart E). The stylised pattern is very similar to that of money demand models. Based on the analysis of the forecast performance of the univariate time series model and the analysis of financial flows as described above, the increasing tendency of economic agents to shift from equity to liquid assets from March 2001 to October 2001 and from September 2002 to early 2003 is captured in the model by two truncated linear trends.⁵ The resulting estimates suggest that

between 2001 Q2 and 2003 Q1 there were significant portfolio shifts into money, which can be estimated to be around €250 billion. It should be remembered, however, that the construction of the variables is to some extent arbitrary and that the univariate model cannot distinguish portfolio shifts from effects of other variables such as the low level of interest rates. The results should therefore be viewed with caution.

Chart E: One-step-ahead forecast error¹⁾ for M3

(EUR billions, with 95% confidence interval (dotted lines))



1) The difference between the observed level of M3 and the level expected by the model.

⁴ See page 56 of the Monthly Bulletin of May 2001 for further details. The time series model used is a univariate ARIMA model allowing for additional regression effects for the non-seasonally adjusted M3.

⁵ A deviation from the linearity assumption was modelled for September and October 2001 by assuming a double intensity for the increase in September and only half the intensity for October. A similar deviation was modelled for November and December 2002, for which only half the regular intensity was assumed.

Conclusion

This box shows that various techniques can be employed to estimate the size of the portfolio shifts from equity holdings into M3 driven by weak stock market developments and major financial market uncertainty in the last few years, which are likely to have been the main factor behind high M3 growth since the second quarter of 2001. The results of all the techniques point in the same direction, namely that the shifts have been very large, even though the estimates derived on the basis of different methods differ significantly, being in a range of €180 billion to €250 billion between 2001 Q2 and 2003 Q1. These estimates would translate into an effect on annual M3 growth of between 2½ and 3 percentage points in 2003 Q1. However, these estimates are characterised by conceptual and measurement problems and should therefore be taken only as rough indications rather than at face value.