

Box I

APPROACHES TO IDENTIFYING AND ESTIMATING PORTFOLIO SHIFTS INTO AND OUT OF M3

The period of exceptional economic and financial uncertainty between 2001 and 2003 led to a strong preference by investors for liquid assets. The associated extraordinary portfolio shifts were reflected in high M3 growth and a continued build-up of excess liquidity. While there is, in general, a close long-run link between developments in M3 and consumer prices in the euro area, large portfolio shifts may blur this link, at least temporarily. Indeed, there are scenarios in which the risks to price stability associated with the excess liquidity created by such portfolio shifts into money may not materialise. For example, such shifts may be only temporary and unwind later as the uncertainty which caused them recedes. In addition, even if the shifts are of a more permanent nature, they may simply reflect a higher liquidity preference on the part of investors, i.e. a desire to hold safe and liquid assets rather than more risky longer-term assets. In this case they would constitute a structural change in money demand. However, the risk also exists that the excess liquidity stemming from portfolio shifts will at some point translate into transaction balances, particularly at a time when economic confidence and activity strengthen.

While the reality is probably always an amalgam of these various possibilities, a first step in the analysis of risks is to develop an understanding of the size of the portfolio shifts. Against this background, this box offers some approaches to identifying and quantifying these portfolio shifts.

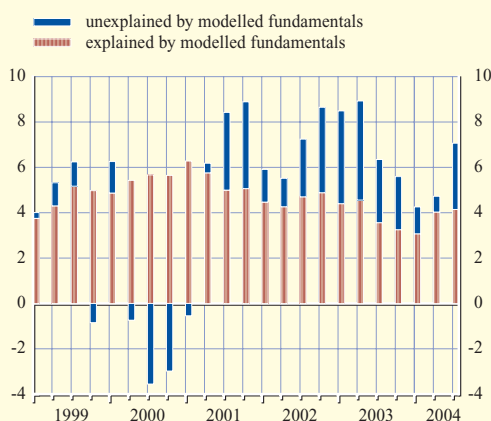
Identifying extraordinary portfolio shifts into money

Ideally, the relationship between heightened uncertainty and the ensuing risk aversion on the one hand, and the demand for the liquid instruments contained in M3 on the other, would be analysed in a structural economic model which explicitly captures the underlying economic behaviour. However, the type and magnitude of the shocks (the events of 11 September 2001 and the protracted decline and volatility in stock markets) that have driven recent portfolio shifts were unprecedented, at least for the period since the early 1980s, for which euro area monetary data are available. Past experience may thus not be a good guide to the explicit modelling of the impact of these shocks in real time. In addition, the complexity of investors' portfolio choices cannot be adequately modelled with the available aggregate data.

Available models of money demand have left "unexplained" a large component of monetary growth in recent periods, especially in the second half of 2001 and the

Chart A Decomposition of quarterly nominal M3 growth in the euro area using a money demand model

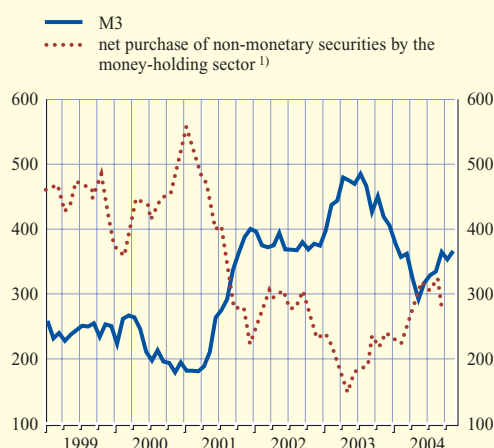
(annualised quarterly percentage changes)



Source: ECB.
Note: Contributions are derived from the model presented in A. Calza, D. Gerdesmeier and J. Levy (2001), "Euro area money demand: Measuring the opportunity costs appropriately", IMF working paper No. 01/179.

Chart B Net purchases of non-monetary securities by the money-holding sector and M3

(annual flows; EUR billions)



Source: ECB, ECB calculations.

1) Calculated as loans to euro area residents plus issuance of securities by the money-holding sector plus current account balance minus instruments included in M3, minus long-term deposits with MFIs minus net external transactions of the money-holding sector other than in securities.

Chart C The conditional correlation between stock and long-term government bond returns¹⁾

(quarterly data, inverse scale)



Source: ECB estimation.

1) Dow Jones EURO STOXX return index and ten-year government bond return index.

period between the latter part of 2002 and mid-2003 (see Chart A). This indicates the special character of these periods, triggering the search for detailed explanations.

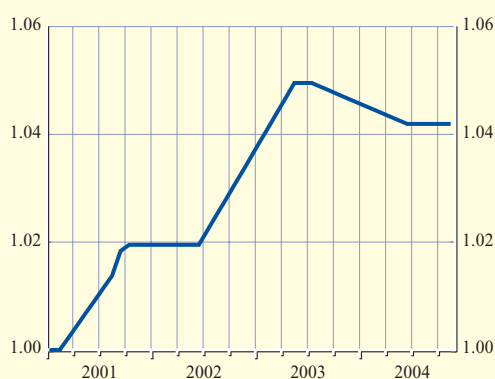
For the purpose of quantifying and explaining portfolio shifts with a view to constructing a corrected measure of M3, other approaches are also of help, in particular selecting judgements from a broad range of economic indicators those that are perceived to capture in real time and in a relatively stable manner the quantitative impact of extraordinary portfolio shifts into and out of M3. Two such indicators are presented below.

The first indicator is a quantitative measure of the net purchase of non-monetary securities (i.e. financial assets outside M3) by the euro area money-holding sector (see Chart B). The indicator shows a strong decline in those periods in which fundamental factors in the model leave unexplained a large part of the strengthening in money demand, i.e. the second half of 2001 and the period from the latter part of 2002 up to mid-2003. In addition, it shows some normalisation of portfolio allocation behaviour in the period from mid-2003 to spring 2004, when a moderation in M3 dynamics corresponded to a significant extent to increasing investment in non-monetary assets.

The second indicator is a measure of aggregate risk aversion proxied by the conditional correlation between returns on long-term government bond and stock market indices.¹ This measure can provide indications of the timing and pattern of portfolio shifts (see Chart C).

1 For details of this measure of risk aversion, see the box entitled "Risk aversion and developments in monetary aggregates" in the December 2004 issue of the ECB's Monthly Bulletin.

Chart D Portfolio shift correction factors for the level of M3¹⁾



Source: ECB.

1) Derived from a univariate time series model as described in the text. A figure of 1.05 indicates that portfolio shifts amount to 5% of the level of M3.

Chart C indicates that risk aversion of euro area investors increased significantly between 2000 and early 2003, i.e. a period in which M3 growth cannot be adequately explained by macroeconomic fundamentals. Despite a considerable decline, risk aversion remained relatively high in 2003 and 2004, possibly explaining why the portfolio allocation of euro area investors tended to normalise more slowly than would have been expected on the basis of past experience.

Overall, taken together, the indicators confirm the assessment that in the period from 2001 to mid-2003 two phases of extraordinary portfolio shifts can be identified. In addition, the period from mid-2003 onwards, especially between mid-2003 and mid-2004, was characterised by some normalisation of portfolio allocation behaviour, albeit at a relatively slow pace.

Quantifying the impact of extraordinary portfolio shifts with univariate time series models

The extraordinary character of the periods under review is confirmed when analysing one-step-ahead forecast errors of a univariate time series model.² The pattern of these forecast errors during the period under review is in line with the stylised information on portfolio shifts provided by the indicators presented above. One way to quantify the impact of extraordinary portfolio shifts is the introduction of so called “intervention” variables (dummies and trends) for the level of M3 during the above-mentioned periods in this univariate time series model.³ More specifically, the impact of the extraordinary portfolio shifts into money in 2001 and between autumn 2002 and early 2003 is modelled as a linearly increasing effect on the level of M3, whereas the gradual unwinding of past portfolio shifts in the period from mid-2003 to mid-2004 is assumed to proceed linearly at a quarter of the pace observed for the earlier shifts into M3. The pattern assumed for the portfolio shifts is statistically significant, with Chart D showing the associated correction factors for the level of M3. (A figure of 1.05 thus indicates that portfolio shifts amount to 5% of the level of M3.)

Applying these correction factors to the level of M3 results in an estimate of M3 corrected for the estimated impact of portfolio shifts⁴ (see Charts E and F). The level of this corrected M3

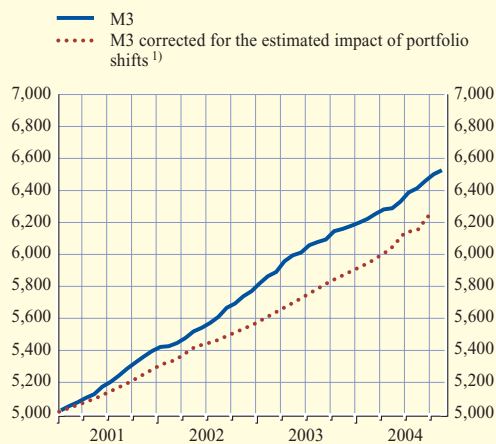
2 For details of the univariate time series model, see the box entitled “Identification and quantification of the distortion of M3 at the start of Stage Three of EMU on the basis of a univariate linear time series model” in the May 2001 issue of the ECB’s Monthly Bulletin.

3 Some alternative approaches have been presented in the box entitled “Estimating the size of portfolio shifts from equity to money” in the May 2003 issue of the ECB’s Monthly Bulletin.

4 A further small correction for volatile movements in central government deposits between 2002 and 2004 has been introduced in this estimate.

Chart E M3 and M3 corrected for the estimated impact of portfolio shifts

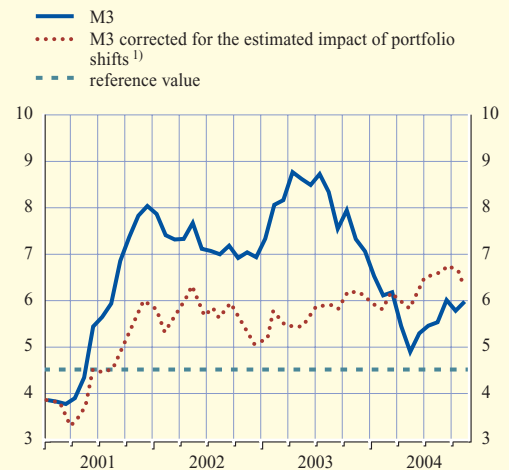
(EUR billions; adjusted for seasonal and calendar effects)



Source: ECB.
 Note: The series are constructed from the index of adjusted stocks with base period January 2001.
 1) Corrections made using the factors shown in Chart D.

Chart F M3 and M3 corrected for the estimated impact of portfolio shifts

(annual percentage changes; adjusted for seasonal and calendar effects)



Source: ECB.
 1) See Chart D.

series has consistently remained below that of official M3 since March 2001. By contrast, since March 2004 the annual rate of growth of the estimate for corrected M3 has, for the first time since early 2001, been higher than that of the official series, consistent with the moderate unwinding of past portfolio shifts.

While the stylised facts are relatively well captured by the estimate of the portfolio shifts, a number of caveats have to be kept in mind. First, the estimates are derived from a very simple model that cannot capture the complex interrelationship of a large number of factors determining portfolio allocation behaviour. Second, the estimate of the correction factors contains judgemental elements. For these reasons, quantifying the exact magnitude of portfolio shifts is not straightforward, and all estimates are inevitably surrounded by considerable uncertainty.