**ECONOMIC
AND MONETARY
DEVELOPMENTS**

Monetary and
financial
developments

Box 2

PERMANENT AND TEMPORARY FACTORS IN BROAD MONEY GROWTH

Notwithstanding the impact of some temporary special factors around the turn of the year, the annual growth rate of M3 has seen a gradual strengthening since mid-2010 (see Chart A). In qualitative terms, the simultaneous strengthening of MFI loans to the private sector suggests that this development may represent a pick-up in the pace of underlying monetary expansion. This view is supported by a variety of quantitative approaches to estimating underlying monetary trends which suggest that monetary dynamics have recently bottomed out and are now showing tentative signs of recovery.[1] Against this background, this box provides a further quantification of the persistent component of M3 growth using techniques that estimate the contributions of temporary factors within an empirically consistent framework, namely a large Bayesian vector autoregression (BVAR) model developed for the purpose of monetary analysis.[2]

Chart A Growth in M3 and underlying M3

(annual percentage changes)

Sources: ECB and ECB calculations.
Notes: The range of measures for underlying money growth are derived using some of the methods described in the box entitled "Underlying monetary dynamics: concept and quantitative illustration" in the May 2008 issue of the Monthly Bulletin.
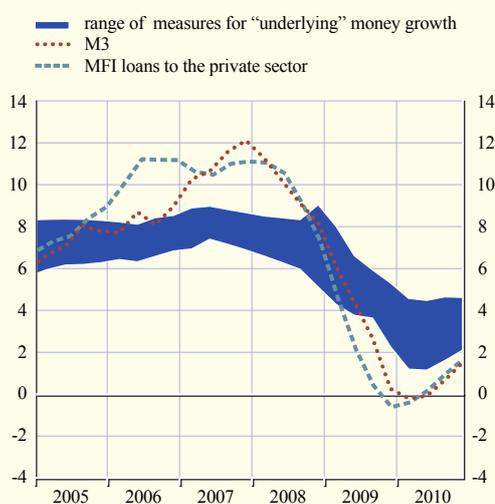
Assessing the pace of underlying money expansion

Gauging the pace of underlying monetary expansion is an important aspect of monetary analysis, as it provides an insight into risks to price stability over the medium term stemming from monetary developments.

In attempting to identify this underlying monetary trend, the natural starting point is to decompose actual money growth into two broad components: persistent and temporary. The former may be associated with the growth of bank credit, since the implied general expansion of bank, household and firm balance sheets is likely to have a lasting impact on money holdings. The latter may be associated with "portfolio shifts", which reflect substitution between money and non-monetary assets driven by yield or risk considerations that are typically of a more transient nature. Special factors of an institutional nature may also exert a temporary effect on money growth. On the basis of this decomposition, observed monetary growth can be corrected for the impact of temporary effects and distortions so as to estimate the underlying monetary trend that

1 The methods used to estimate these various measures of underlying monetary growth are described in the box "Underlying monetary dynamics: concept and quantitative illustration" in the May 2008 issue of the Monthly Bulletin. These empirical measures are, of course, imperfect proxies for the latent concept of "underlying" monetary expansion. In addition, it must be borne in mind that the signalling quality of the various empirical measures may vary over time.
2 This model is presented in Annex 1 to Chapter 4 of Papademos, L.D. and Stark, J. (eds.), *Enhancing Monetary Analysis*, ECB, Frankfurt am Main, 2010. For more details see Giannone, D., Lenza, M. and Reichlin, L. (2009), "Money, credit, monetary policy and the business cycle in the euro area", mimeo, ECB.

is associated with the emergence of risks to price stability over the medium term.

A model-based analysis of temporary factors shaping monetary developments

To supplement and enhance the assessment made on the basis of existing measures of underlying monetary growth, this box presents a new model-based approach to designing measures of annual M3 growth corrected for the impact of the business cycle or other temporary factors. The tool applied is a large BVAR model.
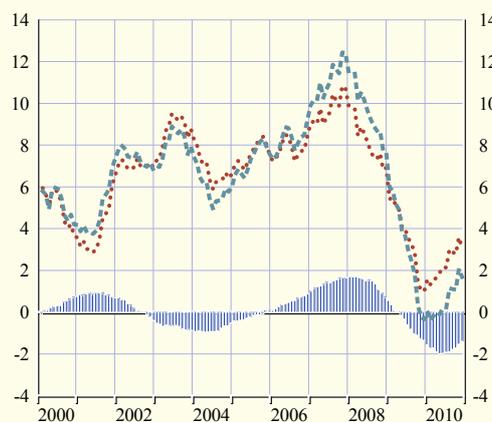
Fluctuations in money holdings may result from changes in the pace of real economic activity and income (proxied in this model by industrial production). Chart B shows the resulting estimate of the contribution of the business cycle to M3 growth and compares the annual growth rate of the headline M3 series with that of the M3 series excluding such a contribution.[3] The chart suggests that annual M3 growth is typically not very strongly affected

Chart B Actual and cyclically-adjusted M3 growth

(annual percentage changes; percentage points)

- contribution of business cycle shock to M3 growth
- actual M3 growth minus contribution from business cycle shock
- actual M3 growth

Sources: ECB and ECB estimates.
Note: Contribution of business cycle shock estimated via the BVAR model as explained in the main text of the box and in footnote 3.

by the business cycle: although the magnitudes of actual and corrected annual M3 growth differ by up to 2 percentage points in specific months, overall the two time series profiles do not exhibit significant qualitative differences. With regard to the recent period, it appears that the recovery in actual M3 growth was at first held back and for a short time increasingly dampened by the business cycle, although this effect has diminished over more recent months.

There are, of course, other temporary shocks beyond those associated with the business cycle, such as those related to speculative activity. Using the BVAR model as described above, it is possible to estimate the impact of transitory shocks on M3 growth.[4] Chart C, which illustrates the contribution of these transitory shocks to annual M3 growth, shows that their impact goes beyond that of the pure business cycle shock and, for instance, also identifies a large part of the portfolio-shift period between mid-2001 and 2003 as being due to such temporary shocks.[5] This period reflects the exceptional preference for liquidity, which, in the context of this model, is not specifically addressed and thus only imperfectly identified. The model does correctly identify the onset of the period in mid-2004 when the increase in M3 growth reflected a strong co-movement of money and credit and thus indicated the more persistent, or "underlying", nature of the
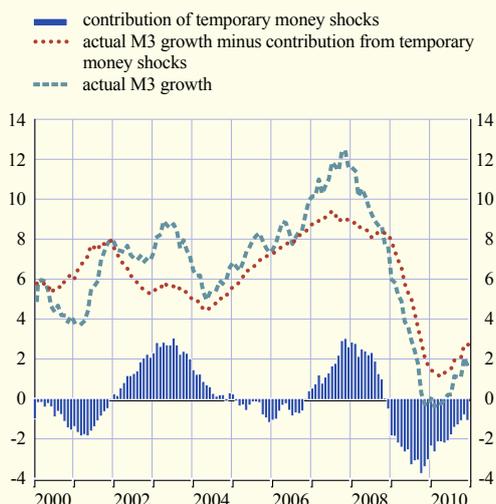
---

3 The shock is that which accounts for the maximum variance of euro area industrial production at medium to high business cycle frequencies (cycles shorter than eight years). Note that this "business cycle shock" is a non-structural shock, as it is not based on any identification restriction, and it can be seen as a linear combination of shocks driving the real business cycle.
4 The method consists of finding from among the possible shocks to euro area M3 those which account for the maximum variance at medium to high frequencies, labelling them as "transitory shocks", and then computing their contribution to M3 growth. The measure of "permanent" M3 growth can then be derived by subtracting this contribution to M3 growth from actual M3 growth. In this case the shock is also non-structural and therefore cannot be interpreted in economic terms (unlike, for example, a temporary money demand shock), but it can be seen as reflecting a combination of temporary shocks directly affecting M3 which may also include – at least partly – the business cycle shock discussed above.
5 See the article entitled "Money demand and uncertainty" in the October 2005 issue of the Monthly Bulletin.

Chart C M3 and its "permanent" component

(annual percentage changes; percentage points)

- contribution of temporary money shocks
- actual M3 growth minus contribution from temporary money shocks
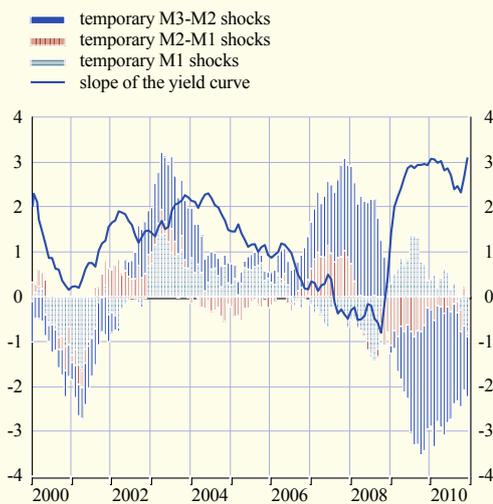- actual M3 growth

Sources: ECB and ECB estimates.
Note: Contribution of temporary money shocks estimated via the BVAR model as explained in the main text of the box and in footnote 4.

Chart D Impact of temporary shock by monetary instrument

(percentage points of annual M3 growth; percentages per annum)

- temporary M3-M2 shocks
- temporary M2-M1 shocks
- temporary M1 shocks
- slope of the yield curve

Sources: ECB and ECB estimates.
Notes: Contributions of temporary money shocks estimated via the BVAR model as explained in the main text of the box and in footnote 4 to the components of M3 separately. The slope of the yield curve is defined as the difference between the euro area 10-year government benchmark bond yield and the 3-month EURIBOR rate.

monetary expansion. With regard to the current situation, most of the recent increase in annual M3 growth seems to be explained by the declining negative impact of such temporary shocks.

It is worth noting that the contributions from the business cycle shock and the transitory money shock do not coincide and appear to be interrelated only in certain specific periods (such as from 2007 onwards). Indeed, the overall correlation between these two contributions from 2000 to 2010 is only about 42%. This suggests that there are many transitory shocks to monetary dynamics beyond those coming from the business cycle.

Looking at the impact of temporary shocks on M1, M2-M1 and M3-M2, it is possible to obtain some insight into the nature of such shocks (see Chart D). For example, the contributions of temporary M1 shocks to M3 growth are highly correlated to the analogous contributions of the business cycle shock. The same does not apply to the other components of M3. A high positive correlation is also found between the contribution of temporary M1 shocks to M3 growth and the slope of the yield curve, while a significantly negative correlation relative to the latter is found for the contributions of temporary shocks to the other components of M3. The latter relationship can be expected, given that a steep yield curve provides investors with an incentive to shift their funds to longer-term and arguably riskier assets outside of M3. This negative relationship can be seen in Chart D in the period since 2004, whereas in the period of exceptional portfolio shifts between 2001 and 2003 this negative link seems to have been overcompensated by uncertainty-related shifts into M3-M1. On balance, it appears that temporary M1 shocks are largely associated with the drivers of the business cycle, while temporary shocks to M3-M2 and M2-M1 are more related to the yield curve.[6]

6 For an analysis of the impact of the yield curve on monetary dynamics, see the box entitled "The impact of the yield curve on recent developments in monetary aggregates" in the December 2010 issue of the Monthly Bulletin.

Conclusion

Overall, the model-based derivation of the impact of temporary shocks on the growth of monetary aggregates supports the indications from available measures of underlying monetary expansion that the recent strengthening in annual M3 growth does not translate one-to-one into an increase in underlying money growth. This is because the strengthening reflects a gradual fading of the dampening impact on money growth of transitory factors, such as from the slope of the yield curve and the cyclical position of the economy. Moreover, when corrected for the impact of the business cycle and other transitory shocks, the outcomes for M3 growth currently fall within the range indicated by available measures of underlying monetary growth. The pace of underlying money growth has remained higher than that of annual M3 growth, but continues to be moderate, suggesting that risks to price stability over the medium-term remain contained.