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## The ECB and its Monetary Analysis

Erik F. Nielsen  
erik.nielsen@gs.com  
+44 (0)20 7774 1749

Ben Broadbent  
ben.broadbent@gs.com  
+44 (0)20 7552 1347

Dirk Schumacher  
dirk.schumacher@gs.com  
+49 (0)69 7532 1210

Nicolas Sobczak  
nicolas.sobczak@gs.com  
+33 (0)1 4212 1343

Ahmet Akarli  
ahmet.akarli@gs.com  
+44 (0)20 7774 1875

Kevin Daly  
kevin.daly@gs.com  
+44 (0)20 7774 5908

Javier Pérez de Azpillaga  
javier.perezdeazpillaga@gs.com  
+44 (0)20 7774 5205

Istvan Zsoldos  
istvan.zsoldos@gs.com  
+44 (0)20 7774 8736

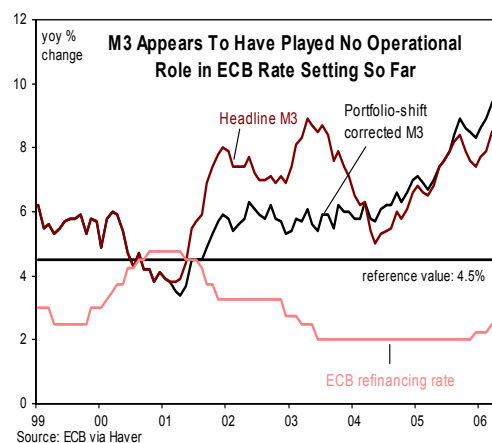
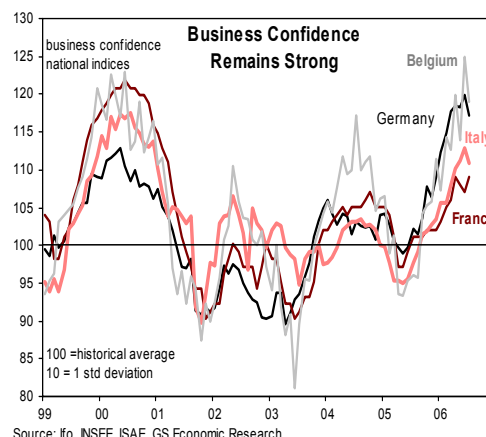
Inês Calado Lopes  
ines.lopes@gs.com  
+44 (0)20 7552 5748

Ann Terry  
ann.terry@gs.com  
+44 (0)20 7774 1166

The ECB has signaled that it will raise interest rates on August 3, thereby continuing its “progressive withdrawal of monetary accommodation”. The hiking cycle was initiated late last year after the ECB concluded that there were upside risks to inflation. We expect Trichet to refer to this risk again on Thursday, after “cross-checking the economic analysis with its monetary analysis”, thus preparing us for further gradual hikes. We remain comfortable with our 3.5% year-end forecast before they are likely to pause as fiscal tightening takes effect in several countries.

In today’s focus, we discuss the ECB’s partial reliance on “monetary analysis”, or M3, in shaping its medium- to long-term inflation outlook. We argue that while long-run M3 growth is a powerful predictor of low frequency inflation, such a correlation cannot be established between M3 growth and inflation for the medium term. Furthermore, it needs some heavy filtering to work. Unfortunately, it cannot therefore be used as an input into real-time monetary policy making because the information about the trend extracted by the statistical filtering process becomes unreliable toward the end of the sample, that is, for the most recent periods critical for making real-time policy decisions.

We reach two key conclusions. First, we argue that while the monetary analysis now points in the right direction (towards rate hikes), there is no guarantee that it will continue to provide the right signal for policymakers in the future. The ECB’s reliance on it therefore implies a risk of future policy mistakes. Second, we propose that M3 is replaced as the key nominal anchor with a more systematic set-up for monitoring inflation expectations.



## The ECB and M3: From Pillar to Post?

**We discuss the relevance of monetary analysis for Eurozone monetary policy making. We conclude that money predicts inflation only over very long periods and only after being filtered extensively – caveats which ought to make money practically irrelevant as a guide to real-time policy. While we don't disagree with the need to raise rates gradually at this time, relying on the monetary analysis could in future lead to policy mistakes. We offer our views on a more useful nominal anchor.**

When M3 growth began to accelerate last summer, the ECB took notice. In June 2005, they said it “might entail risk to price stability” and in the following month they added that “monetary developments support the case for vigilance with regard to upward risk to price stability”. “Vigilance” has since become the apparent preferred code word for pre-announcing a rate hike a month in advance. Given the now buoyant Eurozone economy, the price signals from both the economic analysis and the monetary analysis (used to “cross-check” the economic analysis) point in the same direction – which we believe has contributed significantly to the decision to engage in a “progressive withdrawal of monetary accommodation”.

The ECB differs from most other leading central banks in assigning special significance to the behaviour of a monetary aggregate: Eurozone M3. In its approach to assessing risks to price stability and determining the appropriate policy response, the ECB professes to use a two-pillar strategy. One pillar, economic analysis, “is aimed at assessing the short- to medium-term determinants of price developments ... influenced largely by the interplay of supply and demand in the goods, services and factor markets”. The other pillar, monetary analysis, “focuses on a longer-term horizon, exploiting the long-run link between money and prices”. (Short-, medium- and longer-term has never been defined explicitly, but “short- to medium-term” is usually thought to mean up to three years, while “longer-term” is beyond three years.)

### ECB Has Taken Little Or No Notice of M3 in the Past

The ECB's monetary analysis studies the behaviour of a range of monetary aggregates, including M1, M2, M3 and wider credit aggregates<sup>1</sup>. There is no doubt, however, about the unique significance attached to M3: it is the only monetary aggregate for which the ECB specifies a quantitative reference value (a 4.5% annual growth rate). The ECB appears to see M3 as a proxy for longer-term inflationary trends and, crucially, for longer-term inflation expectations, which ultimately provide the nominal anchor for the Eurozone economy.

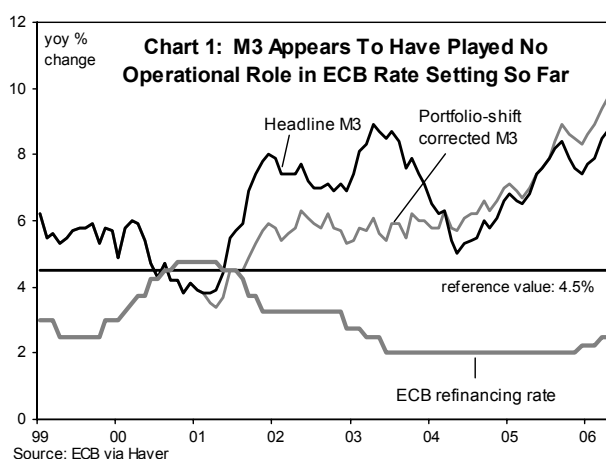
During the past 12 months, the importance of M3 in the ECB's decision-making seems to have increased somewhat. This renaissance follows a few years of relative decline in importance. First, there was a symbolic demotion of the Monetary Pillar at the time of the ECB's Monetary Strategy Review of 2003. Until then, monetary

analysis was always referred to as the First Pillar and economic analysis as the Second Pillar. Following the Review, the categories First Pillar and Second Pillar were dropped, and ECB statements (e.g. European Central Bank (2004)) referred to economic analysis as the first perspective and to monetary analysis as the second perspective. More recently, the term “pillar” has re-emerged as the preferred term.

Second, throughout most of the 7½ years of the ECB's existence, until late last year, there has been little or no evidence that M3 has played any role in real-time policy analysis. This is true even when one considers the ECB's portfolio-shifts-adjusted M3 series, which is meant to be corrected for (temporary) drivers of M3 growth in excess of the reference value that have been identified by the ECB as non-inflationary (headline M3 and the portfolio-shift corrected M3 series have averaged 6.5% and 5.9% respectively, well above the reference value of 4.5%, see Chart 1). During the last 6-9 months, however, rate hikes coincided (or were partly triggered by) the acceleration in M3 growth.

### Money Matters...

Inflation is ultimately a monetary phenomenon. However, for Eurozone to assess the usefulness of M3 as a predictor of inflation, we need more data than the 7½-year history the Eurozone can give us. To address this data shortage, the ECB uses “synthetic” data, covering the period before the Eurozone existed, constructed by averaging or adding national series. This allows us to study the relationship between M3 growth and inflation for the period since 1970.



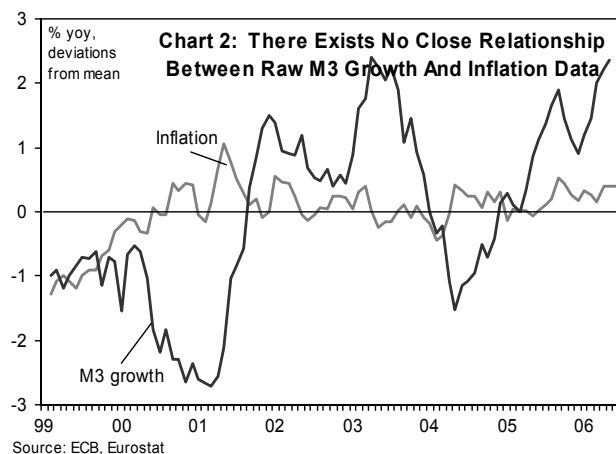
1. Interestingly, no attention appears to be paid to the monetary base, M0, the only aggregate under the ECB's direct control, and for which the ECB does not even publish a series.

No close statistical relationship can be observed from a plot of the raw M3 growth and inflation data (see Chart 2). The simple reason is that the inflationary ‘signal’ from M3 growth is contaminated with substantial noise, created by shifts in the demand for real money balances, or, equivalently, sharp changes in the velocity of circulation of M3 (hereafter referred to as velocity). Fortunately, the velocity shifts that make such a hash of the interpretation of M3 growth in the short and medium term tend to reverse themselves over sufficiently long horizons. ECB staff use statistical filtering techniques to remove the short-term and medium-term noise from M3 growth and inflation, in order to identify the long-run inflationary ‘signal’ from M3. This way M3 growth can be established as a useful predictor of inflation as illustrated in Chart 3. The chart displays the (very) low frequency components – defined as movements with a cycle of more than 10 years – of M3 growth and inflation.

The correlation is clear, and the ability of money growth to ‘predict’ the turning points in inflation three years out is striking. When we consider that over cycles of 10 years and longer M3 growth is a leading indicator of inflation – and, what’s more, the lag between M3 growth and inflation of the order of three years is comparable to the lag with which interest rate changes are generally thought to have their full effect on the Eurozone price level – it may seem unsurprising that the ECB has given money its own pillar<sup>2</sup>.

### ... But Tough to Read in a Useful Way

The three-year lead of M3 growth over inflation holds only for M3 growth and inflation cycles of 10 years and longer. Hence, it does not provide evidence that M3 growth (for cycles of any length) helps predict inflation over the medium-term horizon for which the ECB’s inflation target (below but close to 2% a year) is defined, if our interpretation of the medium term as about three years is correct.

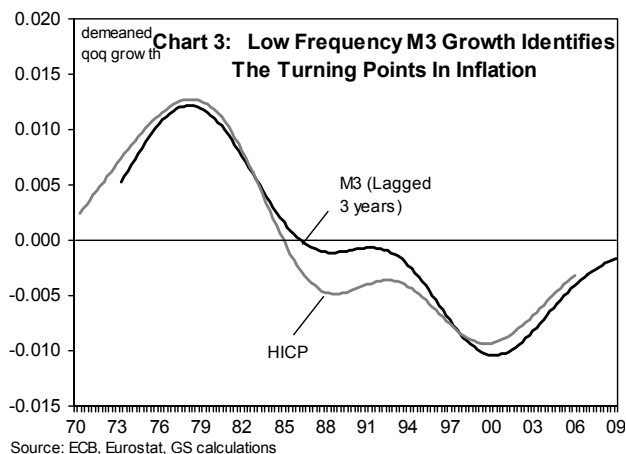


Although this correlation over the long-run is indeed a thing of beauty, it is, unfortunately, of no practical use for policy making: the filtering method used to generate the low frequency signal is highly inaccurate at the end of the sample, that is, in the present, precisely when policy is made – so-called real time.

The choice of the 10-year plus horizon at which we observe the strong correlation between M3 growth and inflation was not accidental; rather it was laboriously chosen as the shortest horizon at which we could find a tight correlation between M3 growth and inflation. Performing the same analysis for cycles of length anything shorter than 10 years not only reduces the correlation between the two series dramatically, it also causes the lead-lag length to vary through time. So if the monetary authority is interested in shorter cycles for M3 growth and inflation, say three to five years to coincide with their presumed horizon for price stability, they will face the problems of poor correlation and variable/uncertain lags on top of the problem encountered when the low frequency signal was extracted: the filtering methods used to generate the signal at any frequency – low, medium or high – is highly inaccurate at the end of the sample. There is no tool here that can be used to assist rate setting in real time.

Consequently, for the purpose of real-time analysis (using only data available at the time the interest rate decision is made), the ECB looks to adjust headline M3 for changes in velocity – portfolio shifts – which it believes it can identify in real time.

An example of changes in velocity that were deemed by the ECB to be sufficiently clear to warrant correcting for them, are the ‘portfolio shifts’ identified during the uncertain economic environment from mid-2001 through to late-2003. Here the ECB produced and published a corrected M3 series that removed shifts into M3 which in its view reflected merely an increased precautionary portfolio demand for very liquid assets rather than an unexpected increase in transactions balances, which were



2. The Eurozone appears to be unique in the sense that we could not find such a stable long-run relationship between M3 growth and inflation for the US, UK or Japan.

likely to boost spending on goods and services in the near future. Following the tech bubble collapse, the events of 9/11, geopolitical uncertainties and the global slowdown that followed, it was not surprising that there would be a (temporary) increase in liquidity preference and thus a (temporary) reduction in velocity.

The ECB uses both institutional knowledge and statistical analysis to identify such portfolio shifts. It uses a univariate time series model<sup>3</sup> and time dummies to capture successive periods in which there are trend shifts in the growth rate of velocity. According to the ECB, the time trend dummies are chosen by studying a large number of variables, of which they emphasize a handful, namely M1, the non-M2 component of M3, loans to Euro area residents, net external assets of banks (MFIs), measures of stock market volatility, and the net purchase of non-monetary securities. This is where credit growth plays a role in the ECB's analysis, not in its own right but as a source of information for correcting M3 growth. We agree that most of these variables are good indicators for shifts in velocity in theory, but we have reservations about how some of them, particularly the market volatility one, are constructed in practice.

Table 1 illustrates that the components of M3 during the period of heightened uncertainty in 2001 grew at very different rates from the latest expansion (June 2005 till May 2006).

From June 2001 to May 2002, M3 growth was driven by the "non-M2 part of M3", which is potentially the highest interest-earning component. It is this component that is likely to witness non-transactions demand-related portfolio substitution into and out of M3. This was the reason for adjusting headline M3 downwards during the period 2001-2003 and hence making it less of a concern with respect to future inflation.

In contrast, the recent June 2005 to May 2006 M3 expansion has been driven by the narrow monetary aggregate M1 – the most transactions-orientated element, leading ECB staff to view this as a continuation of the unwinding of past portfolio shifts into M3. As a result, the portfolio corrected M3 series now lies above headline M3. This explains the ECB's concern over the most recent period of strong M3 growth. We suspect that this development has been one key element in the ECB's decision to initiate the present rate hiking cycle.

### Conclusions:

The construction of the portfolio shift-corrected series is, essentially, an attempt to recover in real time the low frequency component of headline M3 that is correlated with inflation. We have a number of concerns here. We fail to see how the ECB can identify the direction, timing, and magnitude of trend shifts in velocity, as it claims to have done, without eyeballing the velocity series itself.

**Table 1: M3 Decomposed**

	M3	M3 components			Loans
		M1	M2-M1	M3-M2	
Jun 01-May 02	7.1	5.8	5.9	15.0	6.5
Jun 05-May 06	8.1	10.7	6.5	4.6	9.5

Source: ECB

For instance, how did the ECB determine, in real time, that the speed of the reverse portfolio shift out of M3 after 2003 was one-quarter the speed of the original portfolio shift into M3 during the period 2001-2003, as claimed in the Monthly Bulletin January 2005?

If, as we suspect, the portfolio-shift corrected series has been put together, at least in part, with the benefit of hindsight, then its usefulness for real-time monetary policy analysis is undermined. Without knowledge of the underlying causes of the M3 growth surprises and the velocity shocks, it is impossible to determine whether an observed M3 growth rate represents an inflationary threat or not.

We draw two sets of conclusions:

First, by relying on the monetary analysis, the ECB risks making policy mistakes in the future. We agree with the ECB's present gradual withdrawal of monetary accommodation. Inflation remains above its target, GDP is growing at about its potential rate and financial conditions remain relatively accommodating, partly because policy rates remain at historically low levels in both nominal and real terms. However, while the monetary analysis happens to provide the correct signal now for monetary conditions to be tightened, we are far from convinced that the analysis that delivers that signal is robust in a way that will provide the right signal in the future. In other words, even a clock that does not work shows the correct time twice a day, but you should not rely on it.

Second, since we question the practicality of using M3 as the nominal anchor for the Eurozone, we suggest an operational and practical alternative. Importantly, we recognise the need for cementing the credibility of a new institution, and M3 played an important role in this respect. Going forward, it remains a variable worth watching, but we fail to see the analytic argument for it deserving its own pillar.

Rather than using M3 as a nominal anchor for the medium- to longer-term inflation outlook, we suggest that the ECB upgrades its reliance on medium- and long-term inflation expectations as measures of its credibility in maintaining price stability.

3. The Bundesbank's Boris Hofman says that the ECB uses a seasonal reg-ARIMA(0,1,1) model. (*Deutsche Bundesbank Discussion Paper Series 1: Economic Studies No 18/2006*)

Ultimately, the only nominal anchor in a fiat money world is the credibility of the central bank's commitment to price stability – its ability and willingness to use its instruments (the ECB's interest rate) to influence financial conditions so as to achieve the price stability target. In an inflation targeting arrangement – and the ECB has an inflation targeting policy in all but name – the operational expression of price stability is meeting the inflation target. This requires two things:

- To enhance the credibility of the inflation target, one needs to make it as clear and unambiguous as possible. We therefore propose that the inflation target be stated as a symmetric point target rather than a constrained weak inequality (“...below but close to, 2% over the medium term”. How close is close? How long is the medium term?).
- The credibility of the official inflation target can be evaluated by relating it to market participants' expectations of inflation over various horizons. We recommend that the ECB pursue the enhancement of the quality and quantity of inflation expectations measures at different horizons, to gauge the credibility of the official target. Two sources of information come to mind: (1) break-even rates of inflation calculated from the yield of Euro-denominated nominal and index-linked risk-free bonds, and (2) survey measures of anticipated future inflation. Together, they could provide the ECB and the markets with a complete ‘term structure of inflation expectations’ – a highly informative summary statement of the credibility of the ECB's commitment to price stability.

**Willem Buiter, Erik F. Nielsen and Daniel Vernazza\***

\* Willem Buiter is an advisor to Goldman Sachs Economics. Daniel Vernazza is a summer analyst, who will be commencing PhD studies in Economics at the London School of Economics in September.