

What Is Wrong with the Eurosystem's Money-Growth Indicator, and What Should the Eurosystem Do about It?*

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The primary objective of Eurosystem monetary policy is to maintain price stability, defined as an annual increase in the HICP below two percent.¹ Because of the lags in the effects of monetary-policy actions on aggregate demand and inflation, monetary-policy actions cannot affect current inflation and output, nor inflation or output in the near future. A rough benchmark is that monetary policy affects output in about a year and inflation in about two years. Therefore, Eurosystem monetary policy has to be guided by inflation forecasts about two years ahead.

As discussed further in Svensson [11], for successful policy, the Eurosystem must construct conditional inflation forecasts. These forecasts should depend on all relevant information, including the Eurosystem's view of the transmission mechanism for monetary policy, its view of the current economic and monetary situation within and outside the Euro area, information about current and future fiscal policy, private-sector inflation expectations, etc. In particular, the forecasts should be contingent on alternative paths for the monetary-policy instrument rate, that is, the interest rate on the main refinancing operations. This way, the Eurosystem can select an instrument-rate path, for which the conditional inflation forecast about two years ahead is in line with the definition of price stability, and then set the instrument rate accordingly.

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¹ As many commentators have suggested, it would be better to formulate this definition in an unambiguous and symmetric way as a point inflation target, say 1.5%, possibly with a tolerance interval, $\pm 1\%$.

Since forecasts are crucial in a forward-looking monetary policy, transparency requires that the Eurosystem's forecasts are published (including the assumptions and reasoning used in constructing the forecasts) and made available for external scrutiny. This makes it easier for the general public to hold the Eurosystem accountable for its conduct of policy, which in turn provides stronger incentives for the Eurosystem to conduct good policy. The world is waiting for this publication to occur, presumably this fall.

State-of-the-art forecasting for monetary policy, including assessments of the uncertainty of the forecasts, is presented, for instance, in the regular *Inflation Reports* by the Bank of England and by Sveriges Riksbank and in the regular *Monetary Policy Statement* by the Reserve Bank of New Zealand.²

In spite of the example set by these central banks, the Eurosystem has selected a controversial two-pillar approach in its monetary-policy strategy. The first pillar refers to monetary developments and emphasizes a money-growth indicator, the growth of M3 relative to a reference value (currently 4.5%/year). The second pillar is a "broadly-based assessment of the outlook for price developments and the risks to price stability in the euro area... using a wide range of economic and financial variables as indicators for future price developments."

As many commentators have pointed out, there is neither theoretical nor empirical support for this separation of monetary developments, in general, and the money-growth indicator, in particular, from other indicators. The only reasonable approach is to use all relevant information, including international developments, output-gap estimates, cost and wage developments, private-sector inflation expectations, monetary developments, etc., in the construction of an inflation forecast. That is, an obvious improvement in Eurosystem strategy is to combine the first pillar with the second pillar, and rely on one pillar only. Any information in the monetary aggregates that is deemed to have implications for future inflation should be combined with other information in order to construct the inflation forecasts. This is, for instance, the approach taken by the Swiss National Bank, after its announcement in December 1999 that it will abandon monetary targeting and instead rely on an inflation forecast in monetary-policy decisions.

The separation of monetary developments into the first pillar appears even stranger when combined with theoretical and empirical insights about the insignificance of, or even lack of, any information in money growth for future inflation at horizons relevant for monetary policy

² Many other central banks publish regular forecasts; recently the Swiss National Bank and Bank of Japan have started to do so.

(about 1–3 years). Significantly, almost two and a half years after its creation, the ECB has not yet provided any theoretical model or any empirical results supporting the money-growth indicator. Theoretical criticism of the money-growth indicator, for instance, by Svensson, using a traditional aggregate supply/aggregate demand model in [8] and the so-called P^* model in [9], shows that nominal money growth is not the best predictor of future inflation. Instead, a policy aimed at stabilizing nominal money growth leads to a policy reaction function that differs significantly from the one corresponding to efficient stabilization of inflation around an inflation target. Empirical research reaches the same conclusions. Estrella and Mishkin [2] and Stock and Watson [7] find that money growth contains little or no information on future inflation. In empirical models based on U.S. data, Rudebusch and Svensson [6] find that monetary targeting, in the sense of stabilizing nominal money growth, would cause considerable instability in inflation and the output gap, both in a traditional aggregate demand/aggregate supply framework and in a P^* model (in spite of the P^* model often being used by advocates of money-growth targeting). Thus, the results of Rudebusch and Svensson support the theoretical criticism of the money-growth indicator in Svensson [8] and [9]. For Euro-area data, in the first part of a recent ECB Working Paper, Trecroci and Vega [12] demonstrate that the hypothesis that money growth does not Granger-cause inflation cannot be rejected. This jargon means that there is no evidence that current money growth helps to predict future inflation in the Euro area (more precisely, there is no information in money growth that is not already available in other indicators).³

Somewhat surprisingly, preliminary results by Gerlach and Svensson [3] (confirmed by Trecroci and Vega [12] in the second part of their paper) for Euro-area data indicate that the *level* of the *real* money gap (the gap between the current real M3 stock and the real M3 stock consistent with a long-run equilibrium) helps to predict future inflation. But the real money gap is different from *nominal* money *growth*. The distinction is similar to the distinction between the output gap (the gap between real GDP and real potential GDP) and *nominal* output *growth*. Gerlach and Svensson find that the money-growth indicator does not contain any information about future inflation that is not already contained in the real money gap and the output gap (they also conduct Granger-causality tests with the same conclusion and hence support the conclusion of the more extensive Granger-causality tests of Trecroci and Vega [12]). Thus, although

³ Even if the Eurosystem would eventually be able to publish results indicating that the money-growth indicator contains information about future inflation at relevant horizons, it is worth noting that it is not enough that the money-growth indicator helps in constructing *unconditional* forecasts. What is needed is a structural forecasting model that allows the Eurosystem to construct *conditional* forecasts, forecasts that are conditional on alternative monetary-policy actions.

the empirical results of Gerlach and Svensson support the P^* model, they also support the theoretical criticism of Svensson [9] that the P^* model does not provide any support for the money-growth indicator.

Furthermore, although the results of Gerlach and Svensson suggest that the real money gap, rather than the nominal money-growth indicator, may be one of the useful indicators for the Eurosystem, they do not support the idea that monetary developments should be detached from other indicators into a separate pillar rather than integrated with the general construction of forecasts. Similarly, empirical results by Meltzer [4] and Nelson [5] suggesting an effect of the real money stock on aggregate demand propose that such an effect is taken into account when constructing output forecasts; they do not imply any support for the money-growth indicator as a predictor of future inflation.

With regard to the real money gap, the P^* model that underlies the analysis is highly controversial and so far lacks so-called microfoundations (that is, it has not been rationalized by sound microeconomic principles). Furthermore, the real money gap shares with the output gap the dependence on notoriously uncertain estimates of potential output. The real money gap, in addition, requires a stable long-run demand for money, in particular a stable income elasticity of money. There is some evidence in favor of a stable long-run money demand for Euro-area data, for instance, in Coenen and Vega [1] and Gerlach and Svensson [3], although practical experience from several countries shows that shifts in the long-run demand for money are quite common and may occur at any time. The real money gap is hence a fragile construction, even more so than the output gap.

Counter to some conventional wisdom, as discussed in Rudebusch and Svensson [6], a stable money-demand function does not imply that monetary targeting is advisable or that the money-growth indicator is good predictor of future inflation. Indeed, a stable money-demand function does not necessarily imply that even the contemporaneous correlation between nominal money growth and inflation is very high. Intuitively, one can understand why from the following identity,

$$\text{Inflation} \equiv \text{Nominal money growth} - \text{Real money growth},$$

or more formally,

$$\Delta p_t \equiv \Delta m_t - \Delta(m_t - p_t),$$

where p_t is the log price level and m_t is the log M3 stock in quarter t , so $\Delta p_t \equiv p_t - p_{t-1}$ is the rate of inflation, Δm_t is the rate of nominal M3 growth, and $\Delta(m_t - p_t)$ is the rate of growth

and the real M3 stock. Thus, real money growth draws a wedge between inflation and nominal money growth. If it were the case that real money growth was very stable, there would be a close relation between nominal money growth and inflation. However, in practice, real money growth is far from stable. Empirical money-demand functions (for instance, in Coenen and Vega [1], Gerlach and Svensson [3] or Rudebusch and Svensson [6]) are variants of the so-called error-correction form

$$\Delta(m_{t+1} - p_{t+1}) = -\kappa_m[(m_t - p_t) - (\kappa_0 + \kappa_y y_t - \kappa_i i_t)] + \varepsilon_{t+1}, \quad (0.1)$$

where real money growth, $\Delta(m_{t+1} - p_{t+1})$, is negatively proportional to the deviation between current real money, $m_t - p_t$, and the long-run real money demand,

$$\kappa_0 + \kappa_y y_t - \kappa_i i_t,$$

where y_t is real GDP, i_t is the opportunity cost of money, and ε_{t+1} is a shock corresponding to an unexplained residual (κ_0 is a constant and the coefficients κ_y , κ_m and κ_i are positive). Even if the long-run money demand is stable (in the sense of κ_0 , κ_y and κ_i being constant over time) and there are no or only small shocks ε_{t+1} to real money growth, unavoidable variability in real GDP and the opportunity cost of money will cause real money to deviate from the long-run real money demand, which will cause variability in real money growth. This variability in real money growth will reduce the correlation between inflation and nominal money growth.

What should the Eurosystem do in this situation, now that the theoretical and empirical evidence against its money-growth indicator is accumulating? (The ECB has demonstrating commendable openness and scientific integrity by publishing some of this evidence itself.) First, the Eurosystem should reduce its emphasis on nominal money growth and the money-growth indicator, and instead refer more to levels of real money and credit aggregates, perhaps start reporting the real money gap. In particular, it should always report its view on the impact (including the magnitude and time perspective) on inflation of monetary developments. (Tellingly, there is currently no attempt to report any likely consequences on future inflation of monetary developments.) Second, the Eurosystem should consolidate the two pillars into one, and use all its information and resources to produce the best forecasts.

Central banks traditionally avoid admitting mistakes, perhaps believing that such admissions would negatively affect their credibility. I believe such beliefs are irrational. Correcting mistakes and demonstrate learning and improvement would most likely improve credibility. A majority of experts watching the Eurosystem would certainly welcome such a development. Delaying

obvious improvements of the monetary strategy may not only deteriorate the quality of policy but also adversely affect the credibility of the institution.

References

- [1] Coenen, Günter and Juan-Luis Vega (1999), "The Demand for M3 in the Euro Area," Working Paper No. 6, European Central Bank.
- [2] Estrella, Arturo, and Frederic S. Mishkin (1997), "Is There a Role for Monetary Aggregates in the Conduct of Monetary Policy," *Journal of Monetary Economics* 40, 279–304.
- [3] Gerlach, Stefan, and Lars E.O. Svensson (1999), "Money and Inflation in the Euro Area: A Case for Monetary Indicators?" Working Paper (www.iies.su.se/leosven).
- [4] Meltzer, Allan H. (1999), "The Transmission Process," in Deutsche Bundesbank, *The Monetary Transmission Process: Recent Developments and Lessons for Europe*, MacMillan, London, forthcoming.
- [5] Nelson, Edward (2000), "Direct Effects of Base Money on Aggregate Demand: Theory and Evidence," Working Paper No. 122, Bank of England.
- [6] Rudebusch, Glenn, and Lars E.O. Svensson (2000), "Eurosystem Monetary Targeting: Lessons from U.S. Data," Working Paper (www.iies.su.se/leosven).
- [7] Stock, James H., and Mark W. Watson (1999), "Forecasting Inflation," *Journal of Monetary Economics* 44, 293–335.
- [8] Svensson, Lars E.O. (1999), "Monetary Policy Issues for the Eurosystem," *Carnegie-Rochester Series on Public Policy* 51-1, 79–136.
- [9] Svensson, Lars E.O. (2000a), "Does the P^* Model Provide Any Rationale for Monetary Targeting?" *German Economic Review* 1, 69–81.
- [10] Svensson, Lars E.O. (2000b), "Monetary Policy and the Current Economic and Monetary Situation," Briefing Paper for the Committee on Economic and Monetary Affairs (ECON) of the European Parliament, June 2000 (www.iies.su.se/leosven).
- [11] Svensson, Lars E.O. (2000c), "Forward-Looking Monetary Policy, Leading Indicators, and the Riksbank's *Inflation Report* vs. the ECB's *Monthly Bulletin*," Briefing Paper for the

Committee on Economic and Monetary Affairs (ECON) of the European Parliament, September 2000 (www.iies.su.se/leosven).

- [12] Trecroci, Carmine, and Juan Luis Vega (2000), “The Information Content of M3 for Future Inflation,” Working Paper No. 33, European Central Bank.