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Comments on Gaspar, Perez-Quirós and Sicilia, "The ECB Monetary Policy Strategy and the Money Market"*

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April 2001

This informative and well-written paper by Gaspar, Perez-Quirós and Sicilia [5] mainly deals with two issues, namely (1) the "learning period," the first three weeks of the introduction of the Euro in January 1999, and (2) how predictable the Eurosystem interest-rate decisions have been. There is less about Eurosystem monetary-policy strategy than I anticipated from the title.[1]

Regarding the first issue, the learning period, I am not sufficiently knowledgable about the details of the first few weeks of Euro history to provide a very detailed discussion. Instead I will propose two obvious and sensible simplifications of the Eurosystem's implementation of monetary policy. Regarding the second issue, how predictable Eurosystem interest-rate decisions have been, I will provide some general discussion of implementation and measures of predictability.

1 Simplifying Eurosystem implementation

As discussed in the paper, the Eurosystem has instituted reserve requirements, more precisely average reserve requirements over given reserve-maintenance periods. As shown in chart 1.a of [5], these result in upward or downward spikes in the overnight interest rate, due to banks' scrambling for additional reserves or dumping excess reserves at the end of the maintenance periods.

*Presented at the Workshop on "Exchange Rate and Monetary Policy Issues," Vienna, April 19–20, 2001.

[1] I have previously discussed and scrutinized Eurosystem strategy is in Svensson [9] and [10]. See Alesina, Blanchard, Galí, Giavazzo and Uhlig [1], Gali [4] and Blinder, Goodhart, Hildebrand, Lipton and Wyplosz [2] for recent very insightful discussion and scrutiny.

These reserve requirements are completely unnecessary (see Goodfriend and King [6] for a more detailed discussion). Canada, New Zealand, Sweden, and the U.K. have no explicit (or effective) reserve requirements. Still, implementation of monetary policy in these countries works fine. Indeed, the reserve requirements and the maintenance period provide a distortion, which shows up in the upward or downward spikes at the end of the maintenance period. These spikes imply some unnecessary inefficiency; they do not provide any benefits, only costs. Hopefully, these costs are small.

Indeed, since the Eurosystem, as practically all central banks these days, have opted for an interest-rate implementation of monetary policy, it should aim at inducing an overnight interest rate as close to its main refinancing rate as possible. The reserve requirements and the maintenance period detract from that. Instead, the overnight interest rate can be effectively controlled by the main refinancing operations and by setting the corridor between the interest rates of the deposit and lending facilities to control the variability of the overnight rate. So my first suggestion to simplify the implementation is to abolish the reserve requirements.

My second proposal concerns the main refinancing operations. These are done at a weekly frequency, but they concern repurchase agreements of two-week maturities. This means that the Eurosystem is often borrowing or lending money for two weeks to the market, when the market participants know that the Eurosystem may change the interest after one week. Clearly, there will be problematic situations with either a shortage or an excess of willing participants in such transactions. The solution is simple: the frequency of main refinancing operations should match the maturity. If the frequency is weekly (two-weekly), the maturity should be one week (two weeks). Sveriges Riksbank (the central bank of Sweden) came to this obvious conclusion many years ago.

2 Implementation and predictability

Regarding issues of implementation and predictability, I think it is advantageous to review the bigger picture of monetary-policy transmission. Consider the standard (and Eurosystem) situation when a short interest rate, i_t, is the central bank's instrument. Furthermore, consider a standard forward-looking aggregate-demand relation, similar to the one referred to in Clarida's [3] contribution to this conference. Expressed in terms of the output gap, this can be written

$$x_t = x_{t+1|t} - \sigma(r_t - r) + ...,$$

where x_t denotes the output gap in period t, $x_{t+1|t}$ denotes the output gap in period $t+1$ expected in period t, σ is a positive constant, r_t denotes the short real interest rate, defined by

$$r_t \equiv i_t - \pi_{t+1|t},$$

where $\pi_{t+1|t}$ denotes one-period-ahead inflation expectations, and r is the average (short) real rate. Furthermore, ... denotes other (exogenous) factors affecting the output gap. Under the assumption that T-period-ahead output-gap expectations, $x_{t+T|t}$, approach zero when T becomes large ($x_{t+T|t} \to 0$ for $T \to \infty$), we can solve the aggregate-demand relation forward and get

$$x_t = -\sigma\rho_t + ...,$$

where ρ_t is defined by the infinite sum

$$\rho_t \equiv \sum_{\tau=0}^{\infty}(r_{t+\tau|t} - r) \equiv \sum_{\tau=0}^{\infty}(i_{t+\tau|t} - \pi_{t+1+\tau|t} - r)$$

(I have also assumed that the infinite sum of expected future other factors converge nicely).

Here we see that what determines the current output gap is the whole term structure of expected future short real interest rates, $\{r_{t+\tau|t}\}_{\tau=0}^{\infty}$, or, equivalently, the whole term structure of expected future short nominal rates and inflation, $\{i_{t+\tau|t}\}_{\tau=0}^{\infty}$ and $\{\pi_{t+\tau|t}\}_{\tau=0}^{\infty}$, rather than the current short nominal interest rate, i_t. Put differently, the impact of monetary policy depends on the whole term structure of interest and inflation expectations that the central bank induces. Hence, there are good reasons why central banks should continually monitor these expectations.

Söderlind and Svensson [8] provide a survey of alternative ways of extracting interest and inflation expectations from financial prices. Other methods include surveys of different categories of economic agents. One possible source of short-term interest-rate expectations are interest-rate futures. In the absence of these, one can estimate implied forward interest rates from the yield curve.

Consider a given a yield curve, expressed in continuously compounded spot interest rates, $i_{t,T}$, where t is the trade date and $T > t$ is the maturity date. Then, continuously compounded instantaneous forward rates, $f_{t,T}$, where T now is the combined settlement and maturity date, are defined as

$$f_{t,T} \equiv i_{t,T} + (T-t)\frac{\partial i_{t,T}}{\partial T},$$

where $\partial i_{t,T}/\partial T$ is the partial derivative of the spot rate with regard to the maturity date. Thus, forward and spot rates are related precisely as marginal and average cost. Söderlind and

Svensson [8] discuss methods to estimate spot and forward interest rates from observed market interest rates.

Furthermore, forward rates and interest-rate expectations are related as

$$i_{t+T|t} = f_{t,T} - \varphi_{t,T},$$

where $\varphi_{t,T}$ is a forward term premium. Thus, under assumptions about the forward term premium, estimates of forward rates can be used as measures of interest-rate expectations. (In practice, the simplifying assumption of negligible forward term premia is often used.) Given this, $i_t - f_{s,t}$, the difference between the interest-rate decision i_t and previous implied forward rate $f_{s,t}$ $(s < t)$, is frequently used as measure of the news, the new information revealed by the central bank's interest-rate decision relative to previous expectations.

A study of the predictability of a central bank's interest-rate decisions can then be done by examining the properties of this measure of the news, even in the absence of an explicit market for interest-rate futures. This seems a more direct approach than the route chosen by the authors, namely to use the model of Perez-Quirós and Rodriguez [7]. I wish the authors had reported and analyzed this measure of news, too.

Given the importance of the term structure of interest and inflation for the impact of monetary policy, it makes sense that central banks should continuously monitor and report these. In this regard, I would like to suggest an improvement of the ECB's *Monthly Bulletin*, namely to include graphs of these term structures, similar to those in the Riksbank's *Inflation Report*.[2] Figure 1 shows a graph similar to Figure 21 in the Riksbank's *Inflation Report* of March 2001. The thick curve shows the Riksbank's repo rate, and the thin lines show implied forward rates for different trade dates. We see, for instance, that in June and September 1999, the market anticipated the Riksbank's future interest-rate increases reasonably well. However, in March and May 2000, considerable future repo-rate increases were anticipated, without any forthcoming. In March 2001, no further interest-rate changes were anticipated.

Figure 2 is similar to Figure 46 in the same *Inflation Report*, and shows CPI inflation as well as the term structure of inflation expectations by financial-market participants (the source for the expectations is a major regular survey of inflation expectations that the Riksbank has commissioned). We note, in particular, that the Riksbank's 2 percent inflation target has been

[2] I have suggested other improvemens to the *Monthly Bulletin* in Svensson [11]. Generally, a comparison with the Bank of England's or Sveriges Riksbank's *Inflation Report*s make apparent a number of possible improvements to the *Bulletin*.

very credible in the last few years, with long-term inflation expectations converging very closely on the target.

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Figure 1: Repo rate and implied forward rates, Sweden

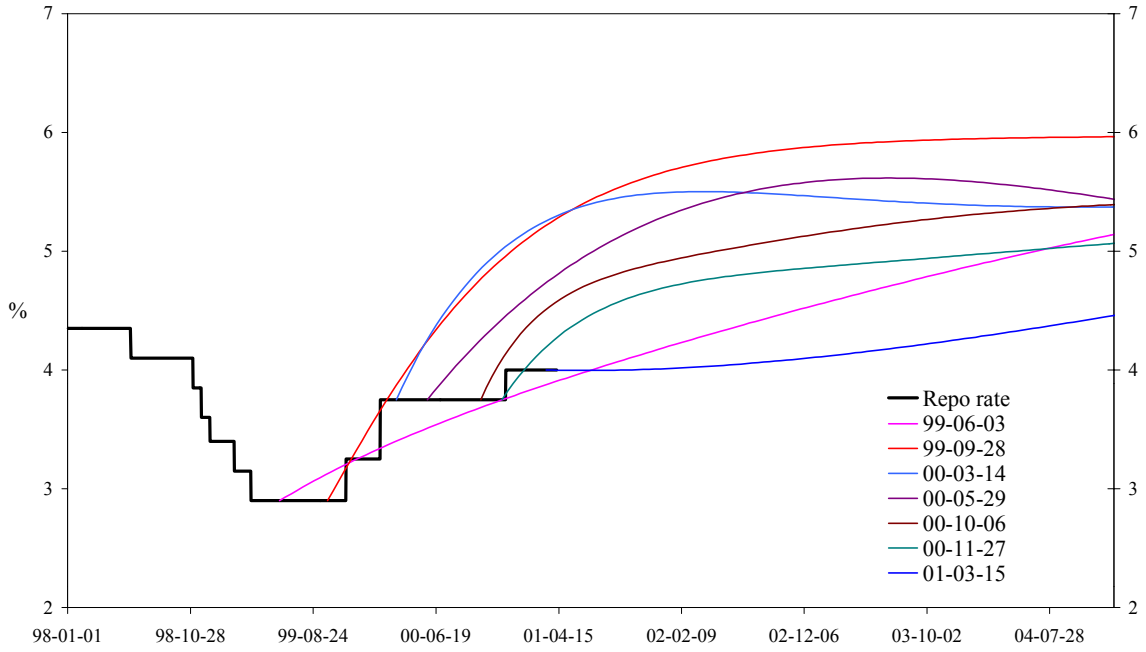

Figure 2: CPI inflation and market inflation expectations, Sweden