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Do Financial Markets Expect a Significant Delay for EMU ?

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Abstract. This short note shows that there exists a simple relation between the private ECU, its theoretical value and the associated interest rates. From this relation, one can estimate the time to EMU as expected by financial markets and see whether this time is consistent with a monetary union taking place on January 1, 1999.

Key words: EMU, ECU.
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1. Introduction

Private and Official ECU have become two different currencies for the past few years. They are traded apart while no active mechanism enforces them to be traded at par. As Folkerts-Landau and Graber (1995) note, "since November 1988, there has not existed any private institutional arrangement or commitment to exchange the private ECU for the Basket at par". As a consequence, their exchange rates against other currencies can deviate substantially from par and market experience has shown that this deviation may be quite large. Typically, the deviation between the two ECU widens during periods of strong pessimism about the monetary union while it narrows when the run-up to EMU is getting more credible.

The aim of this paper is to relate this deviation to the time to EMU as it is expected by financial markets. Basically, we suppose that financial markets are uncertain about the precise date when the monetary union will eventually take place. We assume however that they are perfectly convinced that the private and official ECU will be set at par the day EMU starts (whenever it does). There are strong reasons why we can assume that financial markets believe that this parity rule won't be violated. Indeed the Maastricht Treaty states that the external value of the ECU shall not change at the moment the single currency, the Euro, is introduced (Article 109l). Furthermore, at the Madrid summit (held in December 1995), it was decided that the ECU would be converted into the Euro at a rate of one for one at the beginning of the EMU. Combining these two statements with the fact that the one for one rule refers to the official basket ECU implies that the institutional arrangements will constrain the official and private ECU to be traded at par at the start of EMU.

To summarize, we believe that financial markets are far more convinced about the parity rule than the EMU starting on time (i.e., 1 January 1999). As a result, this rule can straightforwardly act as an "anchor" for the link between private and official ECU. Moreover, the current exchange rate between the two currencies should reveal some information about the expected time before the EMU starts. More specifically, we shall show that a "covered interest rate parity"-like relation holds between the two ECU and the underlying interest rates. In addition, this relation is independent of the conversion

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rates of each currency which will be set (see Frachot (1997) for a full discussion concerning conversion rates).

This paper is in line with previous attempts to compute a probability of EMU and probabilities of each country's membership (see for example De Grauwe (1996) and JP Morgan (1997)). However, we don't calculate such probabilities because they are difficult to recover and necessitate some strong (untestable) assumptions[1] leading to ambiguous results. In particular, the resulting probabilities are never constrained to be positive nor lower than 1. On the contrary, our approach doesn't need any specific assumptions except a No Free Lunch hypothesis which states that financial markets are efficient enough to eliminate any free lunch.

2. A COVERED INTEREST RATE PARITY RELATION

Our computations are extremely simple. We investigate how financial markets currently capture the information that private and official ECU will be exchanged at par the day EMU is launched. Let us denote this day by T and the exchange rate of currecny i against dollar by $S_{\$\,/\,i}$ (i.e., 1 unit of $i = S_{\$\,/\,i}$ dollars). Furthermore let us assume that $T = 1/1/1999$ has not full credibility but, whatever T is, financial markets are perfectly convinced that:

$$S_{\$\,/\,private\ ECU}(T) = S_{\$\,/\,official\ ECU}(T)$$

that is, the at-par rule will be respected. Note that this relation is not supposed to hold for any other date (either before or after T). From the definition of the official ECU, markets thus assume that:

$$S_{\$\,/\,private\ ECU}(T) = \sum_i \omega_i S_{\$\,/\,i}(T) \tag{1}$$

where i belongs to the set of currencies of the basket[2] and ω_i is the amount of currency i in the basket (see appendix 1).

At time t ($t < T$), let us consider a trader who can invest either in the private ECU or in the currencies of the basket. Let us denote $r_i(t,T)$ (respectively $r_{ECU}(t,T)$) the (zero-coupon) yield for currency i (resp. private ECU) and for maturity date T. Investing $S_{\$/i}(t)/\left[1 + r_i(t,T)\right]^{T-t}$dollars at time t ensures that 1 unit of currency i is obtained at time T. Consequently, if markets remove efficiently any free lunch then the following relation should hold:

$$\frac{S_{\$\,/\,private\ ECU}(t)}{\left[1 + r_{ECU}(t,T)\right]^{T-t}} = \sum_i \omega_i \frac{S_{\$\,/\,i}(t)}{\left[1 + r_i(t,T)\right]^{T-t}}$$

or:

$$\frac{S_{\$\,/\,private\ ECU}(t)}{S_{\$\,/\,official\ ECU}(t)} = \sum_i p_i(t) \left[\frac{1 + r_{ECU}(t,T)}{1 + r_i(t,T)}\right]^{T-t} \tag{2}$$

[1] This kind of computations considers that the current state of the economy is a combination of a "No EMU" and a "EMU" states where each of theses states is weighted by its likelihood. For obvious reasons, the estimation of what the pure "No EMU" and "EMU" states are, raises some important problems as none of these states is observed in practice.

[2] Incidently we also assume that markets don't expect any change of the definition of the basket. Indeed, according to the Maastricht Treaty (Article 109g), the composition of the basket is frozen.

where $p_i(t)$ is the weight of currency i in the basket:

$$p_i(t) = \frac{\omega_i S_{\$\ /\ i}(t)}{S_{\$\ /\ official\ ECU}(t)}$$

with $\sum_i p_i(t) = 1$.

According to the master formula (2), the difference between the private and the official ECU can be seen as a weighted average of the spreads between the currency-i interest rates and the ECU interest rate. As a by product, one may compute the time T which solves equation (2). This duration reveals the horizon considered by financial markets to build their hedging strategies regarding the run-up to EMU. As a consequence, **this duration may be interpreted as the time before EMU starts as reflected by hedging strategies of the market participants.**

3. Empirical Implementation

The previous duration can be easily computed provided that zero coupon yield curves are available. We then use the zero coupon yield curves as given by Reuter. These curves are derived from the swap market and smoothness is achieved through cubic spline interpolation. They are continuously updated and are available for all countries of the basket except for three countries: Ireland, Portugal and Greece. Fortunately, these three currencies don't weigh heavily in the basket. However, we make the following approximation: Portugese and Irish yield curves are approximated by the Spanish yield curve while the Greek curve is approximated by the English yield curve. Of course, these approximations may seem quite arbitrary. However, in the case of Ireland and Portugal, we relied on the fact that their 10-year yields (in the bond market) are close to the Spanish 10-year yield. For Greece, nothing can be said. So we arbitrarily took the English yield curve but the influence of the Greek curve is negligible in all our computations.

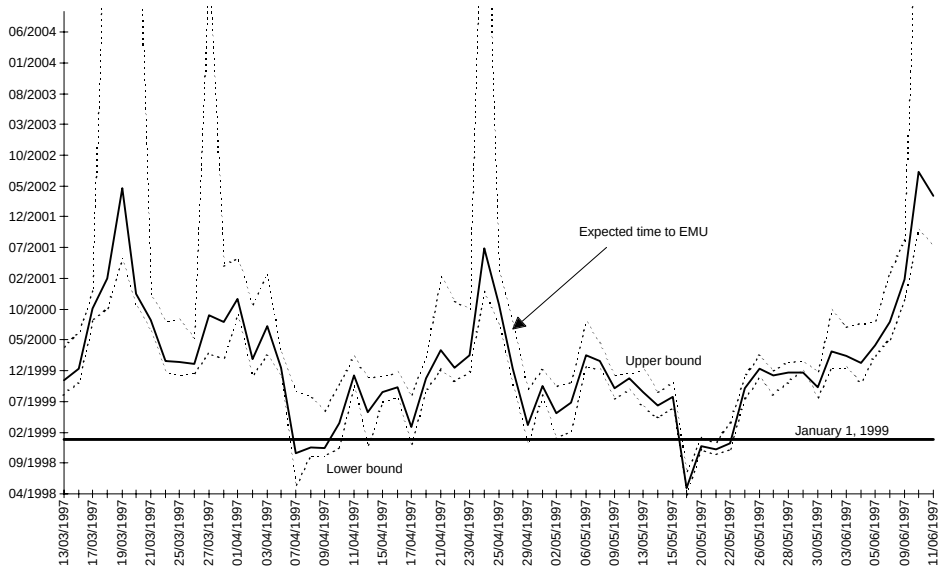
Furthermore, to assess the validity of these approximations, we derive a lower and an upper bound for the expected time T. These bounds are computed by assuming that, whatever they are, these three yield curves lay above the ECU curve and below the italian curve. Economically, it simply means that Irish, Portugese and Greek yields are generally below the italian yields but above the ECU yields. Obviously this assumption should be reconsidered if important moves of these yield curves ever happened.

Graph 1 illustrates this framework. As we can see, markets generally expect a 2 years and 3/6 months before the EMU starts, which is roughly speaking, consistent with a monetary union starting on time. However, from March 14 until March 20, this duration increased and returned back to normal after March 24. As a matter of fact, this period coincides with the debate about whether the monetary union would be delayed due to insufficient convergence of Maastricht Treaty criteria (especially the budget deficit ratio). In particular, many german officials claimed that, if criteria couldn't be satisfied, EMU might be postponed.

On the other hand, things went back to normal on April 7, 1999 following the meeting of Finance ministers on April 5/6. They decided the time-table for annoucement of memberships and then showed their commitment to respect the scheduled time for EMU. More generally, the appendix gives a brief account of Reuter headlines and one can see that our indicator is in line with these headlines.

As a conclusion, our indicator may be a valuable tool to assess markets expectations regarding EMU. Furthermore, if bad news were released in the forthcoming months (con-

Figure 1: Expected time before EMU



cerning for example the budget criterion) , it would be worth following this indicator in order to see how markets react to these news.

APPENDIX: Reuter Headlines

During week March 17-March 21, some officials have publicly considered the hypothesis of a postponement of the EMU if Maastricht criteria weren't strictly satisfied. Following is a sample of Reuter headlines related to this period:

- (March 14) Tietmeyer states that the EMU should be restricted to countries satisfying the criteria.
- (March 17) Meister (Bundesbank) states that the stability of the euro will depend on a small core of homogeneous countries.

- (March 18) Kuehbacher (Bundesbank) considers that a postponement is the only solution if Germany doesn't fulfill the criteria. He also adds that Germany should take a rapid decision about postponement.

By the end of March 19, things get back to "normal":

- (March 19) Tietmeyer claims that EMU will start on January 1, 1999.
- (March 21) Waigel ensures that Germany will satisfy Maastricht criteria.
- (March 24) Kinkel claims that EMU must start on time.

  On March 25, the Federal Reserve raises its Fed Funds rate and a future increase of german rates become more likely. As it could endanger the whole path to EMU, the expected time to EMU increases as well.

  On April 5/6, Finance ministers meet at Noordwjik and detail the time-table for announcement of memberships. As it could be interpreted as a strong commitment to respect the scheduled time, the expected time to EMU becomes very close to January 1, 1999.

References

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