

THE IMPACT OF EURO NOTES AND COINS

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At the beginning of next year, euro notes and coins will be finally introduced into the euro area. Although this is likely to be a major upheaval for the euro-area economy, it does not have any obvious implications for the exchange rate. However, new research on exchange rate determination suggests an unexpected and powerful exchange rate impact of changes in currency demand. This implies that changeover could be strongly euro positive.

- The model explains much of the decline in the euro in terms of change in demand for Deutschmarks.
- It also explains some other puzzling currency moves such as the strength of sterling.

All in all, although the model should be used predominantly to gauge longer term movements in exchange rates, it does suggest the euro is currently undervalued. Indeed, it estimates that a more appropriate value for the single currency given the current monetary conditions is 0.99 cents. Furthermore, it predicts that, as a result of the introduction of euro notes and coins, the euro could rally by as much as 20 cents.

The augmented portfolio balance model

The portfolio balance model of the exchange rate, which attempts to explain the exchange rate in terms of asset demands, has, like most elegant theories of the exchange rate, an appalling track record in actually explaining currency moves. However, a recent extension of that model looks to have a far more impressive track record.¹ The extension is a simple one and is based on the idea

that currency demand has a significantly greater currency impact on the exchange rate than any other type of asset demand. The intuition behind the model is simple: Currency is the only asset whose price cannot change in local currency terms and so is much more important to the exchange rate.

Take the example of the U.S. and German equity markets. If investors in the U.S. start demanding more German equity but no more supply is forthcoming, there are three possible price adjustments that can bring back the balance between demand and supply:

- U.S. share prices can go down (making them cheaper and thus more attractive);
 - German share prices can go up (making them more expensive and thus less attractive);
- or
- the DEM can rise against the dollar, making German shares more expensive to international investors relative to U.S. ones.

The same mechanisms are available to equilibrate the demand for bonds. Now look at an increase in demand for German notes and coins. The only direct price channel that can stifle that demand is a change in the exchange rate, as their price in DEM terms is necessarily fixed. As a result changes in the demand for notes and coins have a significantly greater impact on the exchange rate than any other asset demand since the exchange rate is the only equilibrating mechanism for changes in demand. Therefore, although the stock of notes and coins is tiny in comparison² with the stock of other financial assets, their exchange rate impact is significant.

Explaining exchange rate movements

While the dominant role of currency demand is an intriguing idea, in order to be taken seriously it needs to be able to explain actual exchange rate movements. Here the model does surprisingly well. Its first success is in explaining the fall in the euro. This it can explain easily as the prospective intro-

*Lehman Brothers. "Global Foreign Exchange Strategies", August 1, 2001. Reprinted with permission of the authors.

¹ Sinn and Westermann (2001). "Why has the euro been falling? An investigation into the determinants of the exchange rate" *NBER WP 8352*.

² For example in the U.S., there are about \$ 600 bn notes and coins in circulation, while the size of the bond market in the U.S. is \$ 8.5 tr and the size of the equity market in the U.S. is about \$ 12 tr.

CHART 1
GERMAN CURRENCY DEMAND & DM EFFECTIVE
EXCHANGE RATE



duction of Euro notes and coins has significantly reduced the demand for DEM in recent years – this change has been attributed to a reduced demand for currency, particularly in Eastern Europe.³

As the chart shows, this reduction in demand for DEM notes and coins has a remarkable correlation with the fall in the euro.

Unfortunately, this is not a very strong test since the theory was actually inspired in the first place as an attempt to explain the decline in the euro. As a stronger test of the theory, we have looked at a range of other countries which have not been analyzed in this framework before. The table below shows the estimated relationship between currency demand (Ms) and the exchange rate for a range of DEM cross rates and USD cross rates. The results are quite encouraging.

We proxy currency demand by the supply of notes and coins since almost all the countries we look at practice interest rate targeting which leaves the money supply demand determined (Japan currently and Switzerland historically are the only exceptions as they have practiced some form of money base growth rules).

³ For more details on the developments in the demand for DEM, see Sinn and Westermann (2001) as well as Eichengreen and Wyplosz (1993) "The Unstable EMS" *Brookings Papers On Economic Activity* 51-143.

We also control for other portfolio balance effects including relative share prices (SP), relative bond yields (YD) and relative price levels (P). Generally speaking, money demand has a significant impact on the exchange rate, with higher demand raising the exchange rate – just as the theory predicts. The two notable exceptions are Japan and Switzerland, which, as previously noted, have experienced periods when the supply of currency was not demand determined and so cannot be easily analysed in this framework.

As far as the euro is concerned, two main conclusions stand out, First, the model currently estimates the value of the euro should be \$ 0.99, i.e., approximately 13% above its current value. Second, we estimate that, if the introduction of euro notes and coins return currency demand to pre-EMU levels, then the euro could see up to a 20 cent boost in its value.

Some caveats

The chart overleaf shows one specific example, the relationship between the demand for UK notes and coins and the rise and fall in sterling. The chart captures two of the key elements of this relationship:

- The relationship is long term not short term; deviations between cash demand and currency moves can last for years.
- The predictive power of cash demand is not totally reliable. In the late 1990's sterling started to move well before currency demand.

This means that the above mentioned model can be used as a long-term guide, and not to predict short-term currency movements.

Portfolio Balance Regressions

	Coefficients					
	USD/ DEM	JPY/ USD	JPY/ DEM	GBP/ DEM	GBP/ USD	CHF/ DEM
Ms – Ms ^f	-1.03**	1.48**	-0.33*	-1.12**	-0.50**	0.01
SP – SP ^f	0.05	-0.33**	-0.13**	0.16**	-0.05	0.01
YD – YD ^f	-0.07**	-0.04**	-0.01	0.08**	-0.01	0.02*
P – P ^f	1.35**	3.39**	3.12**	0.37**	-2.14**	1.49**
R ²	0.77	0.89	0.64	0.82	0.36	0.65

Regressions include a constant.

** indicates a 99% level of significance, * 95% level of significance.

The analysis uses monthly data between February 1983 and April 2001.

Furthermore, both the dependent and explanatory variables are in logs.

f superscript indicates foreign variable (i.e. DEM for columns 1, 3, 4 and 6 or USD for columns 2, 5 and 7).

CHART 2
UK CURRENCY DEMAND & STERLING EFFECTIVE
EXCHANGE RATE



The introduction of euro notes and coins

Although the evidence is not overwhelming, the support for this model is sufficient to make it worth watching. One prediction it makes is certainly intriguing. If the introduction of euro notes and coins sends total euro-area cash demand back up to pre-EMU levels – which it should if the fall in demand from East Europe was caused by a fear of currency changeover – then the euro itself could appreciate by up to 20 cents.