

# International Economics Policy Briefs

## Exchange Rates for the Dollar, Yen, and Euro

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Exchange rates are often described as overvalued or undervalued. But how do we make these judgments, and how do we assess by how much an exchange rate is misaligned? These questions have reemerged as central to the international macropolicy debate as the dollar continues to appreciate, the yen plummets, and the euro comes into being.

In *Real Exchange Rates for the Year 2000* Rebecca Driver and I try to answer these questions by calculating Fundamental Equilibrium Exchange Rates (FEERs) for each of the G7 countries. The concept of the FEER was first put forward by John Williamson in 1983, and it has since become the main competitor to Purchasing Power Parity (PPP) as a method of calculating medium-term trends in exchange rates. The last set of comprehensive FEER calculations by the Institute was published in 1994, and so in this study we bring the analysis up to date for the G7 economies.

What do we mean by an "equilibrium" exchange rate? At its simplest it is the real exchange rate that would emerge in the

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medium term once the influence of the business cycle has been played out. We can describe this situation as the economy being in "internal balance". This means not only that output goes to trend, but also that the ability of monetary policy to influence real interest rates, and therefore the real exchange rate, also disappears. This is in sharp contrast with the short term, where actual and expected interest rate differentials have a critical impact on day-to-day or month-to-month movements in exchange rates.

### Why PPP Is Misleading

The most commonly used measure of an equilibrium exchange rate is PPP. These measures are derived by comparing a bundle of goods in one country with the same bundle in another, and calculating PPP as the exchange rate that would make the two bundles cost the same amount. They are widely published: for example the OECD estimates a 1997 figure for PPP of around 170 yen/dollar, or 2 deutsche mark/dollar.

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The problem with this measure, besides generating implausible results, is that it is based on a fallacy. The fallacy is that, if goods are priced differently in different countries, then consumers would simply switch to buying the cheaper good, thereby moving the exchange rate towards PPP. In reality, transactions costs normally prevent such arbitrage taking place. In addition, most trade in G7 economies is in differen-

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tiated manufacturing goods operating in imperfectly competitive markets, where price is just one attribute alongside other factors like quality and reliability. We know from countless studies that the response of trade to movements in real exchange rates is limited, contradicting the simple notion of arbitrage embodied in PPP.

Once we recognize this, it has to be the case that a range of macroeconomic factors will influence the real exchange rate in the medium term. FEER analysis tries to capture these influences. It is sometimes thought that FEERs are intimately bound up with the target zone international policy proposal put forward by C. Fred Bergsten, John Williamson, and others. It is certainly the case that this policy proposal needs a FEER, but the opposite is not true. FEERs are of much more general interest. They represent the real exchange rate that will emerge in the economy *whatever* policy regime is in place. In that sense they are much more akin to a medium term forecast of where exchange rates are heading.

#### How We Calculate FEERs

There are a number of different ways to calculate FEERs. We could, for example, use a complete macroeconomic model and project it into the medium term. Once the model suggested that the economy is at internal balance, we could use its projections for the real exchange rate as the FEER. The problem with this method is that the calculation is only as good as the model, and it may be difficult to look at issues of sensitivity and robustness.

The method we use in this study is a more partial equilibrium approach, in the sense that we calculate some key inputs into the analysis "off model", before using a model of trade to calculate the FEER. As a method this ignores some feedbacks that may exist in the economy, but what evidence we have suggests that these feedbacks are relatively small and can safely be put to one side. The advantage of our approach is that it is clear where our results are coming from, and it is also easy to look at some issues of sensitivity.

What are the crucial off-model assumptions? The first concerns the level of internal balance of trend output. Here we mainly use figures calculated by the OECD. We assume, for example, that in 1997 output in the US was 1-2 percent above trend. The UK was roughly at trend, but all the other G7 countries were 2-3 percent below trend.

The second key assumption concerns the medium-term current account. We do *not* assume that in the medium-term current accounts must balance. This would be unrealistic both historically and theoretically. There are a number of reasons why national saving may exceed or be less than national investment for long periods of time. For example, different demographic profiles mean that Japanese consum-

ers have on average been saving more than US consumers for many years. In addition, the government may run deficits or surpluses over a number of years.

John Williamson and Molly Mahar have calculated our assumptions about medium-term current accounts in an appendix to our study. They suggest that, using published data, the US will have a trend current account deficit of around 2 percent of GDP in 2000, while Japan will have a similar surplus. Both Germany and the UK will be in rough balance, but France and Italy will be running surpluses, partly in an effort to fulfill the fiscal conditions for European Monetary Union (EMU).

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Once these assumptions have been made, we then use an econometric model of trade to calculate the real exchange rate that will generate this medium-term current account once the economy is in internal balance. This real exchange rate is the FEER. Our econometric model has to do a number of things. First, it must assess how much of today's current account is generated by temporary movements in trade, or by the dynamic effects of recent exchange rate movements. These need to be eliminated to calculate the FEER. Second, we need to assess the effect that moving to internal balance will have on imports and exports. Finally we need to know what impact the exchange rate has on the current account to assess how far it must move to achieve the medium-term current account.

#### Results

The following table presents the consistent set of bilateral exchange rates for the G7, which we calculate will be FEERs for the year 2000. The most noteworthy figure is for the yen/dollar, where we calculate a FEER of 80-95 yen/dollar. Compared to recent exchange rates, this implies an undervaluation of the yen of around 40 percent. The dollar is overvalued against the deutsche mark as well, but less so.

Within Europe, the current cross-rates for the franc and lira against the deutsche mark appear to be well within the range we calculate for the FEER. Conversion to the euro at current rates would therefore not cause problems for these economies. However, our results suggest that sterling is currently overvalued against the deutsche mark by around 30 percent, and so the UK is correct not to be entering European Monetary Union at this time. As the dollar is also overvalued, however, the current sterling/dollar rate is not seriously out of line with the FEER.

### Fundamental Equilibrium Exchange Rates in 2000

	Sustainable current account (percentage of GDP)	FEER (against dollar)
UK	-0.2	0.60 - 0.74
US	-2.0	-
Germany	-0.3	1.35 - 1.65
France	1.5	4.59 - 5.61
Italy	3.0	1391-1700
Japan	1.9	77 - 95
Canada	-1.9	1.40 - 1.72

We have also calculated a FEER for the euro, based on our results for Germany, France and Italy. Our FEER for the dollar/euro rate is in the range 1.4-1.15, compared to a current implicit parity around 1.1. As the current rates for the franc and lira against the deutsche mark are close to FEERs, then our results for the euro/dollar are similar to those for the deutsche mark/dollar, implying an overvaluation of around 15 percent.

#### Uncertainties

Our results have been expressed in terms of ranges to emphasize the uncertainties involved in calculating FEERs. These uncertainties are of two types. The first area concerns the inputs into the calculations, and in particular our assumptions about the trend level of output and the medium-term current account. For this type of uncertainty we are able to quantify the sensitivity of our estimates.

Suppose we have underestimated the trend level of output in one of these economies by 1 percent. Higher output will imply higher imports, which will worsen the current account, requiring a depreciation in the FEER to restore external equilibrium. For most of the G7 the depreciation required is in the order of 1-2 percent.

The sensitivity of the FEER to changes in the medium-term current account is larger, and differs between countries to a greater extent. If the US could only sustain a current account deficit of 1 percent of GDP in the medium term, for example, then the FEER for the dollar would initially need to depreciate by 5 percent compared to our central estimates. Over time the magnitude of this depreciation would slowly fall, because the lower deficit would reduce interest payments overseas, leading to a gradual reduction in the depreciation required to sustain this current account. Nevertheless, our calculations suggest that the FEER is very sensitive to our assumptions about medium-term current accounts.

The second area of uncertainty in our estimates concerns the trade model we use. Equations for the volume of exports and imports are central to our model, but unfortunately they are not the most reliable macroeconomic relationships. Japan provides

a good example of the difficulties that can occur. The 1990s have seen a substantial reduction in Japanese output growth. There are theoretical reasons for believing that this could be accompanied by a shift in Japanese trade, with more rapid import growth following an opening up of domestic markets, and a slowing down in exports as more production locates overseas. There was only marginal evidence for this effect in the data we had available, but nevertheless we did make some adjustments to our model to take account of this. If the adjustments we made were too little or too much, our estimates for the Japanese FEER could be significantly out, and there would be knock on effects on the other G7. Unfortunately it is almost impossible to know the magnitude of these structural changes before they occur.

While it is important to recognize these uncertainties, it is also crucial that we do not draw the wrong conclusions from them. Although we have presented our estimates as ranges, they are best viewed as distributions, where the mid-point of the range is our best guess of the most likely outcome. More importantly, the fact that PPP calculations are not subject to similar uncertainties does not make them more reliable as a guide to equilibrium exchange rates. It is a foolish person who, having dropped gloves in a darkly lit street, decides to look for them in a brightly lit square.

#### Reactions and Implications

One reaction to these calculations may be that they cannot be correct, because our FEER estimates are so far from current parities. However this is to misunderstand the nature of the FEER itself. The FEER represents where exchange rates are heading over the next five or so years, and there are good reasons why actual exchange rates may depart substantially from them. In particular we would expect countries like the US and UK, with strong economies where monetary policy is or is expected to be relatively tight, to have overvalued exchange rates relative to the FEER.

The current Asian crisis is also bound to be influencing current parities for the yen. Our estimates for the FEER, however, are "crisis free," in the sense that we have assumed that it will have no effect on medium-term levels of growth, trade, or capital flows. While this is not an unreasonable best guess, there remains a small chance that the crisis will have long-term effects, and current exchange rates will reflect this possibility until the situation stabilizes.

It is also worth noting that in 1995, actual exchange rate parities were quite close to our FEER estimates. In fact in our study we calculate FEERs for both 1995 and 2000. In both cases, they are the exchange rate that would result if the economy had moved to internal balance at that date. FEERs do

change through time for a number of reasons, but in fact our estimates for FEERs in 1995 and 2000 are not very different. Equally, actual exchange rates were all within our calculated FEER range in 1995.

A more serious criticism of our results is that they are inconsistent with the actual level of G7 current account balances. If the United States was really so overvalued, would its current account deficit not be much larger? The problem here is timing. It is true that our estimates imply that, if current parities were maintained into the medium term, the US deficit would be much larger than it is now. However, it takes time for overvalued exchange rates to translate into large deficits. Initially firms may attempt to maintain market share by cutting margins, particularly if they believe appreciation is temporary. As a result, current accounts are a lagging indicator of exchange rate

misalignment. We should also note, however, that very recent trade data do show a sharp increase in the US deficit and Japanese surplus, which is exactly what our calculations would predict.

As the relationship between current parities and the FEER is the one we would expect, given the relative position of the G7 in the business cycle, it is difficult to draw any clear policy conclusions from our results. Given the low levels of unemployment in the United States, it would be incautious to recommend lower US interest rates, while the recession in Japan hardly encourages higher Japanese interest rates. Our results therefore reinforce the importance of correcting the cyclical imbalances across the G7 as a means of reducing the serious extent of misalignment in current exchange rates.

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