

## EXCHANGE RATE OVERSHOOTING

*This article examines the phenomenon known as exchange rate overshooting where exchange rates some times diverge from their long run or 'normal' values.*

### Introduction

Since the move towards a freer system of international exchange rates in the early seventies, the foreign exchange markets have shown a considerable degree of volatility. There has also been a feeling amongst some business people and economists that certain exchange rates have deviated from their long-run or 'true' values for considerable periods of time. For example, during 1980/81 the pound sterling was widely regarded as 'overvalued', while more recently the sustainability of the US dollar exchange rate has been questioned. When an exchange rate persistently deviates from its perceived long-run value it may be said to have 'overshot'.

One form of 'overshooting' sometimes follows an economic shock, such as an increase in the money supply. The exchange rate does not immediately move to its new long-run 'normal' value, but rather moves beyond or overshoots that point. In recent years, beginning with an important article by R. Dornbusch,<sup>1</sup> economists have been attempting to explain why this might happen.

### Overshooting in Response to a Monetary Shock

Consider the case of a hypothetical country which was open to international trade and to international capital flows and which was operating a 'floating' exchange rate. Suppose the central bank allowed the money supply to increase by 10 per cent. In the long run the increased money supply would normally cause a 10 per cent price increase. The rise in the general price level would result in a loss of competitiveness of this economy compared to the rest of the world, since goods produced would be 10 per cent dearer. To restore the

original level of competitiveness — or in other words, to restore the original 'real' exchange rate — the exchange rate would need to depreciate by 10 per cent. Thus the long-run position would be one where there had been no change in the 'real' exchange rate, the rise in money supply and prices having been exactly offset by a fall in the 'nominal' exchange rate.

However, the exchange rate might not move to its new long-run value immediately, and this could happen even if all the participants in the foreign exchange market were fully aware that the long-run value of the exchange rate had changed. The reason for this is that because prices do not react instantly to changes in the money supply, an increase in the money supply would probably lead initially to a temporary fall in domestic interest rates. This would reduce the attractiveness of holding interest-bearing domestic assets.

Participants in the foreign exchange markets, in deciding where to place their capital, would weigh up the interest they could earn on any given currency against the extent to which that currency was expected to depreciate in value. In this instance they would know two important facts; namely, that the new long-run exchange rate was 10 per cent lower, and that the return on holding domestic assets had been reduced. Both of these factors would contribute to an outflow of capital and to a depreciation of the exchange rate. But because the domestic interest rate had been reduced, the exchange rate would have to fall to a point where the expectation of a future increase in the value of the currency was sufficient to compensate investors for the reduced interest rates. In other words the exchange rate would have to fall beyond the long-run level. The exchange rate would fall by an amount in excess of the rise in the money supply, which would amount to a 'real' exchange rate depreciation. The exchange rate would have effectively 'overshot' its long-run value.

This short-run overshooting would have occurred because participants in the foreign exchange market would have fully reacted to the 'news' of the increase in

<sup>1</sup> Dornbusch, R. (1976). Expectations and Exchange Rate Dynamics. *Journal of Political Economy*, pp. 1161-1176.

the money supply before the full effects of the money supply increase had worked their way through the domestic economy. Eventually domestic prices would rise forcing domestic interest rates to return to normal levels. Then and only then would foreign exchange participants no longer demand an 'expectation of appreciation' premium on their holdings of domestic assets, and the exchange rate would move back up to its long-run value.

Briefly, the consequences of the opposite case where the money supply decreased by 10 per cent would be the following:

Foreign exchange market participants would form the view that the long-run value of the exchange rate would be 10 per cent higher. Concurrently interest rates would rise. Arbitrage in the foreign exchange market would cause the exchange rate to appreciate beyond the new long-run value to the point where the higher interest rate earned on domestic assets was just offset by the expectation that the exchange rate would eventually fall back to its long-run level. Once domestic prices and interest rates had fully adjusted to their long-run levels the exchange rate would return to its own long-run level.

### The Basic Cause of Overshooting

What causes the exchange rate to overshoot in this manner?

It is the imbalance that comes about when one market — the foreign exchange market — is quicker to react to new information than the rest of the economy. In the cases outlined above, the 'news' was that there had been a change in money supply, which implied a change in the long-run value of the exchange rate. If all the price setters in the domestic economy had reacted to the change in the money supply by promptly changing their prices by the same amount, interest rates would not have been pushed out of line, and the exchange rate would then have moved straight to its new long-run value. But because the domestic economy is slow to adjust, the 'disequilibrium' that temporarily arises in the domestic economy spills over to affect the exchange rate.

Why is the foreign exchange market likely to react more quickly to news than the domestic markets for goods and services?

It is not necessarily due to foreign exchange market participants being more 'rational' than price setters in the rest of the economy. Rather it comes about from inherent differences in the nature of the respective markets. The exchange rate can be viewed as the price of an asset traded in an organised market. This puts it in the same class as other assets traded in organised markets such as gold and stocks. Typically such markets are heavily influenced by the public's expectations of future events, and when new information comes along there are rapid changes in asset prices to eliminate unexploited profit opportunities through arbitrage. So long as relevant new information continues to occur the asset prices remain volatile.

This 'anticipation' feature of exchange rate setting is not found to the same extent in the markets for goods and services where present circumstances tend to dominate, partly because of the existence of a host of contractual arrangements. In these markets very rapid adjustment of prices is sometimes not practicable.

Obviously if there were restrictions on the flow of capital across national frontiers, or if for some reason the participants in foreign exchange markets were slow to react to new information, then the exchange rate might not overshoot. In fact, to the extent that the foreign exchange market was itself slow to adjust compared to the speed of adjustment in domestic markets, the exchange rate might even undershoot. However, with international controls on capital movements having been largely abolished in the developed world, exchange rates are much more likely to exhibit overshooting than undershooting.

### Complications

Many other factors may be important in determining the extent to which an exchange rate will overshoot in response to a change in the money supply. To the extent that trade flows react to the movement of the exchange rate there will be a current account effect serving to reduce the size of the overshoot. Exchange rate movements also have a feedback effect on the value of holdings of wealth, which may in turn affect the exchange rate. The scale of the overshoot depends also on the size of the initial interest rate response to the change in the money supply. Clearly there are numerous factors which need to be taken into account, making an accurate prediction of exchange rate movements very difficult.

Of course, in reality most countries' money supplies are continually expanding, and the exchange rate of one country follows a long-run 'trend', with its rate of depreciation or appreciation being roughly equal to the difference between the domestic and foreign rates of inflation. The unanticipated 'event' which may cause the exchange rate to overshoot is a change not in the actual level of the money supply, but in the rate of growth of the money supply.

If for instance the central bank suddenly slowed the rate of growth of the money supply — in other words if it 'tightened' monetary policy — this would result in temporarily higher interest rates as well as an expectation of a new long-run trend for the exchange rate. Eventually the economy would shift to a lower rate of inflation and lower interest rates, matched by a stronger exchange rate. But in the short-run, before interest rates had fallen, foreign exchange market participants would bid up the exchange rate to a level above the new long-run trend, the temporarily high interest rates being matched by an expectation that the exchange rate would subsequently fall. Once again the exchange rate would have overshot.

This may have been what happened to the UK exchange rate over 1980/81. Though there are other explanations for the strong sterling appreciation over those years — North Sea Oil for instance — it seems probable that a contributing factor was the move to a tighter monetary policy.

So far this article has considered only the case of overshooting resulting from unanticipated changes in the money supply, which is the case that has attracted most attention. Other events such as a sudden change in the terms of trade can also under certain circumstances cause an exchange rate to overshoot. The principle behind the overshooting phenomenon is in all cases the same: some markets are slow to adjust, the foreign exchange market is not.

## Options for Intervention

Given that overshooting sometimes takes place, is it a problem that requires corrective action from the authorities?

The case for some form of intervention in the foreign exchange market in order to smooth fluctuations in the exchange rate depends on the soundness of three assertions, namely:

1. That exchange rate deviations from their long-run trend have a negative effect on national income or some other policy target.
2. That the authorities can perceive the true long-run trend that the exchange rate should be converging to.
3. That exchange market intervention will be effective and not in itself harmful.

False price signals are implicit in overshooting, and an associated misallocation of resources is likely to be involved. Moreover, to the extent that overshooting adds to the volatility and general unpredictability of exchange rates, it may discourage international trade and capital flows, with a consequent negative effect on national income. This may occur despite the existence of a forward exchange market and risk spreading through asset diversification. Misaligned exchange rates can thus have a negative effect on national income.

But for intervention to be successful the authorities must be able to gauge the extent to which the current exchange rate deviates from its long-run trend. Given the present state of knowledge this can often prove to be very difficult.

There also has to be an effective means of intervening in the foreign exchange market that does not in itself create more problems than it solves. 'Unsterilised' intervention, where the authorities simply buy or sell foreign exchange without offsetting the impact of this on the domestic money supply, may indeed be effective in shifting the exchange rate. The difficulty is that undesirable consequences for domestic monetary conditions may be involved.

It is possible to use 'sterilised' intervention, which involves selling (or buying) domestic securities to offset the domestic monetary consequences of foreign exchange purchases (sales). This leaves the domestic money supply unchanged, but its impact on the exchange rate is unlikely to be strong or lasting.

An alternative to direct intervention in the foreign exchange market is a tax or exchange control aimed at discouraging capital flows in order to prevent the exchange rate from overshooting when monetary policy is tightened. This 'sand in the cogs approach' would have to be of short duration if it were not in itself to be a major distortion. Also it does not solve the problem of knowing when and by how much an exchange rate is misaligned.

A more fundamental objection is that this type of intervention simply attempts to cure one distortion by introducing another. Overshooting arises because certain markets are slow to adjust. An effective policy approach must in the first instance be aimed at increasing the speed of adjustment in these markets, not in ameliorating the consequences elsewhere.

Movements in exchange rates provide useful signals,

which wherever possible should not be overridden and distorted. Policies aimed at removing rigidities in price setting and wage setting and at increasing the flexibility of the labour market offer a better solution to the problem of overshooting. There is, of course, a limit to the extent that such policies will work. These markets, even after unnecessary rigidities had been eliminated, would still be slower to adjust than the foreign exchange market.

In addition, overshooting would be minimised to the extent that the rate of growth of the money supply followed a smooth course, and to the extent that economic policy is set within a reasonably stable medium-term framework. The aim must be to minimise the incidence of unanticipated 'shocks'.

## The New Zealand Context

This article has been mainly concerned to give a theoretical discussion of exchange rate overshooting. It may, however, be interesting to consider briefly the New Zealand context.

The main features that will determine whether or not the New Zealand exchange rate overshoots in response to a sudden tightening or loosening of monetary policy, are likely to be the speed of adjustment of the foreign exchange market compared to the speed of adjustment in the goods and labour markets. Exchange controls have been abolished recently, and there is no longer any reason to doubt that speed of adjustment in the foreign exchange market is reasonably high.

Furthermore, while present Government policies are aimed at increasing the flexibility of goods and labour markets, the domestic economy may still be characterised by a relatively inflexible wage setting system and a persistence of the cost-plus approach to price setting in the markets for goods and services. It seems that, at least in the present environment, the difference in the speed of adjustment in the foreign exchange market and the domestic goods market is unlikely to be less pronounced here than elsewhere. Some overshooting of the exchange rate in response to a sudden change in the rate of growth of the money supply would thus appear to be a strong possibility. Certainly it has been a widely held view that the Government's firm monetary policy has contributed at times over the past year to high exchange rate levels that may be above their longer term equilibrium. While this view cannot be substantiated, the Government does recognise that a high exchange rate, as well as high interest rates, may be unavoidable for a time in order to reduce the inflation rate to a more acceptable level.

## Overshooting and Fiscal Deficits

A factor that can prolong an overshoot of the exchange rate is the persistence of a large fiscal deficit. This can be seen in the case of the United States.

The US dollar has now been considered 'overvalued' for a number of years. It seems plausible that the initial strong appreciation of the dollar resulted from the tightening of monetary policy that took place after the Federal Reserve changed its operating procedures in 1979. This does not, however, explain the continuing overshoot over time unless one believes, somewhat

implausibly, that year after year the US economy has continued to fail to adjust to persistently tight money. It seems likely that the main factor preventing the US dollar from returning to a more 'normal' level is the development and persistence of a large fiscal deficit. A fiscal deficit that is financed by borrowing usually raises interest rates which in turn puts upward pressure on the exchange rate and worsens the current account position. In the sense that US private savings are insufficient to finance the large fiscal deficit, the current account deficit — and the corresponding foreign capital inflow — is unavoidable so long as the large fiscal deficit persists.

## Conclusions

It seems clear that when exchange rates deviate from their long-run trend values this is not necessarily due to 'irrational' behaviour on the part of participants in foreign exchange markets, but is more likely a result of a fast foreign exchange market reaction to important economic news.

A large number of factors were seen to be involved in determining whether or not, and for how long, an

exchange rate is likely to overshoot. These factors include the stance of monetary policy, the extent to which the domestic economy correctly anticipates the monetary policy, the extent of rigidities in price and wage setting mechanisms, and the extent to which fiscal policy puts upward pressure on the exchange rate.

It was also noted that, if overshooting were to be seen as a problem at all, the logical policy approach would be to attack the root causes, rather than to attempt to regulate exchange rate movements which are only symptomatic of the underlying factors. As Dornbusch has recently stated, 'Few would argue that bond markets need intervention just because interest rates are unusually high. It is well understood, at least by those who understand, that this is a reflection of the policies that influence demand and supply conditions in the bond market. The same is true for the exchange market and the answer is more sensible policy mixes (monetary, fiscal and incomes policy), not schemes to fix interest rates or exchange rates.'<sup>2</sup>

2 Dornbusch, R. (1984). The Overvalued Dollar. *Lloyds Bank Review*, pp. 1-12.