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THE CHOICE OF EXCHANGE RATE REGIME

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Foreword

This series of *Handbooks in Central Banking* has grown out of the activities of the Bank of England's Centre for Central Banking Studies in arranging and delivering training courses, seminars, workshops and technical assistance for central banks and central bankers of countries across the globe.

Drawing upon that experience, the *Handbooks* are therefore targeted primarily at central bankers, or people in related agencies or ministries. The aim is to present particular topics which concern them in a concise, balanced and accessible manner, and in a practical context. This should, we hope, enable someone taking up new responsibilities within a central bank, whether at senior or junior level, and whether transferring from other duties within the bank or arriving fresh from outside, quickly to assimilate the key aspects of a subject, although the depth of treatment may vary from one *Handbook* to another. While acknowledging that a sound analytical framework must be the basis for any thorough discussion of central banking policies or operations, we have generally tried to avoid too theoretical an approach. Moreover, the *Handbooks* are not intended as a channel for new research.

We have aimed to make each *Handbook* reasonably self-contained, but recommendations for further reading may be included, for the benefit of those with a particular specialist interest. The views expressed in the *Handbooks* are those of the authors and not necessarily those of the Bank of England.

We hope that our central banking colleagues around the world will find these *Handbooks* useful. If others with an interest in central banking enjoy them too, we shall be doubly pleased.

Needless to say, we would welcome any comments on this *Handbook* or on the series more generally.

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ABSTRACT

This *Handbook* examines the role of the exchange rate in monetary policy and the factors which may determine the choice of regime, in the spectrum from free floating to indefinite fixing, or even surrendering one's own currency. The role of official intervention in the exchange market is reviewed, as is the case for and against controls on foreign exchange transactions.

Here and there, examples of the experience of particular countries are quoted. Some of these may, in time, be overtaken by events, but the basic analysis presented here should, it is hoped, remain valid. No attempt is made to offer policy prescriptions for individual countries, either in general or specific terms. The *Handbook* will have served its purpose if it assists those who are responsible for such decisions to reach them with confidence.

THE CHOICE OF EXCHANGE RATE REGIME

1 What is the exchange rate?

The exchange rate is the price at which the national currency is valued in relation to a foreign currency. It is of direct practical importance to those engaged in foreign transactions, whether for trade or investment. It also occupies a central position in monetary policy, where it may serve as a target, an instrument or simply an indicator - depending upon the chosen framework of monetary policy.

2 Exchange rate as an indicator

The exchange rate affects arithmetically the price of imports when expressed in domestic currency and the price of exports when converted into foreign currency. It therefore has a link to inflation and, in conjunction with other data - such as costs and prices at home and abroad - may serve as an indicator of external competitiveness and hence of likely developments in the balance of payments. However, the exchange rate, being the price at which the country's money exchanges for foreign money, is first and foremost a monetary indicator. It is often a signal of the stance of monetary policy. For example, in the absence of any other changes in economic circumstances, a weakening of the exchange rate (or downward pressure resisted only by official intervention) may suggest that monetary policy is too loose, or at any rate loose relative to policy in the country of the reference foreign currency; and a strengthening, or upward pressure, may suggest that policy is tight, or relatively tight.

3 Exchange rate as a target or instrument

The exchange rate may itself be a target for policy, with a definite rate being set, or a clearly observable formula applied. Alternatively, the exchange rate may be actively managed, in conjunction with other

components of monetary policy, with the aim of achieving desired objectives in the areas of inflation, real activity, or the balance of payments, but without there necessarily being a precise target level for the rate itself. In a market-based economy the exchange rate cannot usually be manipulated without consistent adjustments to, or consequences for, other components of the monetary situation - such as money stock, liquidity or interest rates.

In the short term, changes to the exchange rate may influence the real economy and the balance of payments. In the longer term those effects may to some extent be cancelled out by the feed-back of the exchange rate movement (and associated changes in domestic monetary conditions) on the domestic price level. The extent and timing of such feedback is a matter for academic debate and empirical investigation. In the extreme case, if feedback is complete, it may not be possible to control the *real* exchange rate (ie the rate adjusted for relative inflation rates) in a deterministic fashion beyond the short term. This "monetarist" point of view, which implies that monetary policy does not influence the real economy in the long run, has been a major influence on the conduct of economic policies in recent decades.

4 Evaluating the exchange rate

When monitoring the exchange rate, or when seeking to adjust it in cases where it is regarded as an effective instrument or target of policy, a number of different yardsticks may be employed against which to judge the appropriateness of the rate. Some of the concepts most commonly discussed are outlined in the table below. The list is not intended to be exhaustive of all possibilities.

In practice, while these concepts may be useful for monitoring or analysis of exchange rate movements and of the wider implications of such movements, none can be regarded unequivocally as the appropriate gauge of "equilibrium" for the exchange rate.

Concept	Arguments for	Arguments against[1]
1 Rate which will produce balance in the external current account.	Current account equilibrium often accepted as a reasonable target.	Lacks precision: responses of current account flows to exchange rate are uncertain and subject to lags. Zero balance on current account seldom appropriate: some countries should naturally have surplus (others a deficit) accompanied by capital outflows (inflows), depending on structural and other factors, which will also alter over time.
2 "Fundamental equilibrium exchange rate", defined as that which produces equilibrium for current account plus normal capital flows.	Refinement of (1), which acknowledges that optimum may include some net structural capital inflows or outflows.	Lacks precision as in (1). Also difficult to determine what "normal" capital flows should be, and often difficult to measure them.
3 "Purchasing power parity" rate, which equates overall domestic and international price levels.	A popular concept, and useful benchmark for various comparative economic analyses (eg on standards of living).	Does not necessarily represent external equilibrium, especially because large volumes of goods and services are not in practice tradable internationally, and because of long adjustment lags.
4 Rate which equates export prices with those of competitor countries.	Appears to define equilibrium.	International competition tends to drive export prices to uniform levels, but possibly at markedly varying levels of export profitability between countries - implying disequilibrium in the broader context.
5 Rate which equates domestic and international unit costs (in total or, more commonly, unit labour costs); ideally, calculations are adjusted to eliminate effect of different positions in the economic cycle.	Presents equilibrium in terms of a measure of competitiveness.	Problems similar to (3), though perhaps less severe, but also problems of measurement.
6 Rate which equates domestic and international real wage rates.	Concept of international equilibrium in labour market. May be appealing also in context of social policy.	Given structural rigidities within and between national labour markets, may not be consistent with other macro policy objectives.
7 Path for nominal rate which is consistent with gradually appreciating *real* exchange rate.	Designed to slowly squeeze out inflation by progressive tightening of monetary stance. Applicable in some cases of transition.	Beyond a certain point may damage real economy and competitiveness to unacceptable degree.

[1] These are some of the arguments against the *concepts*. If it were decided to adopt any of the concepts as a *target*, additional questions would arise as to whether and how that might operationally be achieved.

5 Advantages and disadvantages of fixed or floating rates

The principal contrast among exchange rate regimes is between those which are based on a floating rate and those based on a fixed rate. The arguments in favour of a floating rate and those against are shown below.

Floating

For	Against
1 The rate is determined principally by market forces. A cardinal principle underlying the market economy is that markets are successful in allocating resources (including finance) efficiently.	1 Markets seldom operate with perfect efficiency; there is a risk, therefore, of overshooting, which will result in the exchange rate being at a level not warranted by "economic fundamentals", perhaps for a considerable period.
2 If markets operate efficiently and the rate floats freely, there will be no opportunities for speculators to make profits at the expense of the central bank.	2 The future path of the exchange rate will be uncertain, which may create difficulties for businesses in planning and pricing. In certain instances it may be possible to insure or hedge against such uncertainty through the derivative markets (eg forwards, futures or options), but this will invariably involve a cost.
3 Demand and supply for domestic currency against foreign currency (and vice versa) will be balanced in the market. There is no obligation on, or necessity for, the central bank to intervene (other than to execute orders on behalf of its own customers). Generally, therefore, domestic monetary aggregates will not be affected by external flows, and a monetary policy can be pursued which is independent of, and does not need to have regard to, monetary policy in other countries.	3 The freedom to operate an independent domestic monetary policy may be abused: for example, the government, not being impelled to prevent the exchange rate depreciating, may be tempted into inflationary budgetary and monetary policies.

The arguments for and against a fixed rate are to a large degree the mirror image of those relating to a floating rate.

Fixed rate

For	Against
1 A fixed rate, if it is durable and is regarded as durable, provides businesses with a sure basis for planning and pricing, thereby helping to develop investment and international trade. 2 The fixed rate imposes a constraint on domestic monetary policy: if its stance is significantly out of line with that of the country to whose currency the national currency is fixed, unwelcome inflows or outflows may occur, which require intervention by the central bank. Inflows may exacerbate inflation; outflows may drain the country's foreign exchange reserves. This constraint on monetary policy is often regarded as a useful discipline against adopting policies which diverge significantly from the anchor country. 3 A fixed rate will be desirable if one believes that it is possible to adjudge what the appropriate equilibrium is, and wants to hold the rate there. 4 A fixed rate regime which imposes direct discipline on monetary policy (eg as with a currency board) may be preferred in situations where financial instruments and markets are insufficiently developed for the operation of a market-based monetary policy.	1 A fixed rate, if it lacks complete credibility, may be vulnerable to speculative attack; this could have damaging consequences for monetary stability in the economy or for the foreign exchange reserves; ultimately speculation may force abandonment of the fixed rate. 2 There is no sure way of establishing whether a chosen rate is optimal, or sustainable; neither the government nor the central bank can necessarily presume to know better than the markets where the equilibrium lies. 3 While a fixed nominal rate may be important for monetary purposes, it will not determine the *real* rate, which may in some cases be regarded as an important indicator or target (see also footnote 2 opposite). 4 Maintenance of a fixed rate requires that the central bank stands ready to intervene in the foreign exchange market at that rate; decisions are then needed on how to cope with the domestic monetary consequences (eg whether to "sterilise" or not); even with sterilisation it may not be possible entirely to insulate the domestic economy from the effects of intervention. 5 An adequate quantity of foreign exchange reserves is required. 6 Subordination to the monetary policy of another country may not always be beneficial.

Thus, the protagonists of free floating argue that the foreign exchange market is a highly transparent and efficient market, and that market forces should be left unimpeded. Monetary policy should be set autonomously, as deemed appropriate in the domestic context (eg for

achieving stability in the price level), and the exchange rate should be allowed to follow whatever path transpires as being consistent with that.

Meanwhile, the protagonists of fixed rates (meaning fixity against one or more major currencies or main trading partners) draw support from a mixture of political, commercial and economic reasons. The economic argument cites the beneficial role of an exchange rate anchor in imposing monetary discipline (provided that the anchor currency is sound); and a fixed rate is preferred to any form of managed floating because the exchange rate is not regarded as a useful independent instrument of policy in the long run.[2] Whether through shared sovereignty (as prospectively with European monetary union) or in cases where sovereignty over monetary policy is effectively surrendered (the currency board case), the benefits of fixity are regarded as outweighing the costs.

Discussion has often focused on the role of the exchange rate in enabling the economy to sustain output in the face of various sorts of shocks. Thus, it has been suggested that a floating exchange rate best copes with internal shocks to the real economy, because a movement in the rate may then be the most effective way of restoring output to its equilibrium path; whereas a fixed rate best copes with internal monetary disturbances, because inflows or outflows of reserves can serve as a cushion. It has also been argued, on the one hand, that a highly open economy is best served by a fixed rate, because with a floating rate not only may there be considerable volatility in the nominal rate, but also feedbacks from the exchange rate to costs and prices may be so strong that no significant changes in the real exchange rate could be engineered, even

[2] The ability to adjust, at a stroke, the domestic price level in terms of international currencies has at times been regarded as a valuable instrument of policy - for example, with a view to influencing the current account of the balance of payments - but nowadays the consensus is that it may be difficult to achieve a lasting change in a country's international competitiveness (or the real exchange rate) through manipulation of the nominal exchange rate, because, for example, the inflationary impact of a depreciation on the domestic price level eventually cancels out the initial advantage.

if desired; but, on the other hand, that an open economy needs a floating rate in order to insulate it from the monetary consequences of the many external shocks to which an open economy is certain to be exposed.

Given such contrasting prescriptions, and the dependence of each prescription on the particular circumstances or on the particular objectives of policy, it is not surprising that the policy choice in practice is less straightfoward than any theoretical model might appear to suggest.

In practice, moreover, the choice of regime is not a stark one between, on the one hand, a completely free float and, on the other, permanent fixity. There is a spectrum of options, as in the following table:-

Regime	Description	Remarks
Free float	Complete freedom for market forces	Possible in theory but rarely sustained for very long in practice - the central bank usually wants to intervene to some degree.
Managed float	Central bank intervenes, but usually only in attempt to smooth fluctuations	Very common; problem is that central bank does not know whether a movement in the rate is a short-term fluctuation or the sign of a more fundamental trend.
Crawling peg	Central bank intervenes to achieve specific objective of controlled adjustment of rate, often on continuous basis.	Quite common, but only sustainable if market is in broad concurrence with central bank's view as to appropriate path of rate; adjustments may be in accordance with some formula (eg to effect linkage to a basket of currencies, or to reflect inflation differential with competitor countries); formula or other basis for adjustment usually publicised.
Fixed, with margin or target zone	Permitted to fluctuate within margin, but central bank(s) intervene to prevent rate moving beyond margin	As with European Monetary System, which has operated with margins ranging from 2 1/2% to 15%. If rate persists at or near limit, central bank faces same options and challenges as in fixed-rate system.
Fixed but adjustable	Fixed (with central bank support if necessary) for extended periods, perhaps within very narrow margins, but adjusted if in disequilibrium or if there is unwithstandable pressure	"Bretton Woods" system (where maximum permitted margin of fluctuation was 1% on either side of a declared parity against the dollar); widespread 1945-72 when the IMF had to adjudicate cases of "fundamental disequilibrium". May prove costly in terms of intervention if necessary adjustment delayed. Less common nowadays, since mobile international capital enforces adjustments sooner rather than later.
Fixed, by central bank	A stricter version of "fixed but adjustable"	Indefinite fixity intended, but cannot be guaranteed; adjustments may be necessary, even if the possibility is not openly admitted; otherwise required intervention may be prohibitively large. Rare nowadays, but may arise as prelude to European monetary union. Some historical examples of prolonged fixity when capital was less mobile or was subject to controls (eg British pound and Irish pound up to 1979).
Fixed , by currency board (or gold standard)	Base money (= currency plus banks' balances at central bank) must be fully backed by foreign currency (or gold) at fixed rate	Strict and automatic discipline which ensures convertibility of base money at fixed rate and hence, by arbitrage, ensures close tracking by market rate. Nevertheless, resulting pressures elsewhere in economy - eg on banks, on activity, or on prices - may give rise to political pressures for change in rate, or for abandonment altogether of currency board system.
Unified currency	Independent currency is abandoned and some other currency adopted	Question arises whether one country is entirely subservient to the other in terms of determining monetary policy and reaping seignorage, or is allowed a share. Contrast "dollarisation" (de facto partial abandonment of national currency - no influence over US) with proposed single European currency (joint decision making and profit-sharing).

6 Developments in recent years

In recent years the world has witnessed a remarkable diversity of approaches to exchange rate policy. These include:-

(a) The decisions by countries of the former Soviet Union to establish independent currencies. These decisions were inspired in part by political considerations and operational difficulties, and in part by the wish to be detached from what was, at the time, a highly unstable and depreciating rouble (notwithstanding the fact that the majority of the newly independent currencies depreciated, at least initially, by even more).

(b) Continuing preparatory work in the European Union for a single currency, amidst contrasting developments in the member states: for example, the exchange rates of a core group, including Germany and the Netherlands, have remained very stable, whilst several others (Italy, Spain, UK) have departed considerably from earlier narrow ranges. Meanwhile, some aspirant members of the European Union are conscious of the desirability of stabilising their currencies relative to core EU currencies.

(c) A small number of countries (eg Argentina, Estonia, Lithuania) have opted for a fixed rate backed by a currency board.

(d) The world's three leading currencies - dollar, deutschemark and yen - have continued to float against each other, with occasional bouts of official intervention when the rates have been judged to be seriously out of line with fundamentals. The situation may perhaps be described as a managed float, but it is not clear whether central banks have been able to exert any lasting influence through intervention, over and above the effects attributable to adjustments of other policy instruments such as interest rates or fiscal policy.

(e) A number of developing countries have moved towards more freely floating currencies. This trend is evident, even after allowing for completely new currencies, from the following table, based on IMF classifications.

EXCHANGE RATE REGIMES		
	end-1989	end-1995
	Number of countries	
Pegged to single currency or composite	94	67
Flexibility limited in terms of single currency or group of currencies	13	14
More flexible (adjusted according to set of indicators, or managed or independent float)	46	99
	153	180

Source: International Monetary Fund

7 Polarisation

Opinion has tended in recent years to polarise the choice: either float freely or adopt as strict as possible a fixed regime. The reasoning is that any middle course is more vulnerable to speculative attack and instability, and would therefore call for frequent discretionary action by the central bank; but the central bank is presumed not necessarily to be able to make superior judgements to those of the market.

A middle course which has at times attracted serious consideration from some policy makers, as well as in some academic circles, has been some form of target zones or managed ranges, particularly for the major currencies - see 6(d) above. Yet the idea has never won sufficient consensus to be put into widespread practice. The European Monetary System (EMS) has demonstrated that a managed system of bands with periodic adjustments of central rates may in some circumstances be viable, but even there only a small core of the currencies have conformed continuously with the original narrow margins; and the EMS is generally regarded now as a transitional step on the road to monetary union rather than as a preferred mechanism itself for all time.

8 Criteria for deciding whether to fix or to float

Over the years there has been much debate amongst both academics and practitioners as to what are the appropriate criteria by which to judge whether particular countries constitute an optimum currency area and may therefore realistically contemplate fixing exchange rates or, ultimately, unifying their currencies.

The following factors have variously been suggested as relevant:-

Relative size and trade integration	Small country may find it easier to lock onto large one, than would two countries of similar size, especially if it trades heavily with the larger one. See also section 5 above.
Flexibility of economic structures	To the extent that the exchange rate is believed capable of performing as an instrument of macroeconomic adjustment by altering a country's competitiveness (many people argue, however, that this is not possible beyond the short run), a country which abandons that option by adopting a fixed rate will need an efficient alternative mechanism for adjusting relative prices. This means, in practice, that the economy must have internal flexibility in its price and cost structures. In particular, this may require flexibility in the labour market, if activity is to be sustained in the face of external competition.
Factor mobility	Adjustment may be assisted if labour and capital are mobile between the countries in question. In particular, the potential movement of labour to higher wage areas may precipitate or accelerate necessary adjustments to wage rates. In practice, however, labour is unlikely to be mobile enough to cushion short-term shocks, which may reverse.
Ability to absorb or survive shocks	The flexibility or mobility, described above, may help the economy to survive shocks - such as a sudden surge in world commodity prices - without putting the fixed exchange rate under pressure. To the extent that shocks do, however, impose hardship or create other economic or political difficulties, the resilience of population and institutions will be a factor in determining long-term viability of the fixed rate.
Homogeneity of economies	The capacity to withstand shocks depends also on the similarity of economic structure of the countries amongst which the exchange rate is fixed. The more homogenous are the economies, the more even will be the impact of economic shocks and hence the more durable the exchange rate.
Availability of resource transfers for support	If, because of lack of flexibility, absence of homogeneity, or for any other reasons, pressures build up against the exchange rate beyond the limits of tolerance, so that its sustainability comes into question, the regime may only survive, in both economic and political terms, if there is substantive support from one country to another in the sense of real resource transfers - for example budgetary transfers - to compensate for unemployment resulting from an overvalued exchange rate or an inflexible labour market.
Absolute stability; reliability of anchor currency	Finally, if countries are to be linked by a fixed exchange rate, it is important that the collective stance of monetary policy, whether in effect dictated by the dominant partner or decided jointly, should exhibit adequate stability and be directed to goal(s) which are agreed or at least accepted by both - eg holding inflation at bay. Otherwise, one or other partner may wish to sever the link.

9 Criteria for European Monetary Union (EMU)

A rather different set of considerations has been established by the European Union in order to judge whether a sufficiently high degree of "convergence" has been achieved to qualify an individual member country to join in the proposed single currency. These criteria are different because they aim to *measure* whether adequate convergence has in fact occurred, rather then merely to *describe the structural conditions* which might facilitate that convergence. And they are essentially financial criteria, without references to the condition of the real economy. They contain elements of flexibility to enable some discretion by ministers in the final decisions.

EMU Criteria

Measure	**Rationale**	**Comment**
Containment of current size of government deficit relative to GDP (3%), or progressing satisfactorily to that level, or above it only for exceptional or temporary reasons.	Fiscal indiscipline would be presumed to threaten monetary discipline.	Helpful towards monetary discipline, although not essential. Assists other objectives of European integration.
Containment of outstanding government debt relative to GDP (60%), or ratio declining and approaching that level at satisfactory pace.		
Containment of consumer price inflation (close to best performers among other EU countries)	Necessary to support fixed exchange rate or currency union.	Some convergence necessary, but some divergences in inflation may in certain circumstances not be inconsistent with stable exchange rate.
Track record of stability of exchange rate within Exchange Rate Mechanism.	Need for track record before taking final irrevocable step.	-
Convergence of long-term interest rate (close to those in best performers).	Evidence of achieving credibility in financial markets.	-

10 Fixed rate regimes in practice; past, present and future: some examples

In this section a number of practical instances involving fixed rates are examined, with particular attention to the circumstances which may have determined - or may in due course determine - the durability of the arrangement.

Unitary currency zones

It is unremarkable that no country operates more than one currency within its own borders. Despite the fact that economic conditions may vary considerably from region to region, there are no instances of different provinces or regions within one country having different sovereign currencies (although sometimes currency regulations may vary - in the case of special economic zones, for example).

The high degree of interdependence, mutual trade and - though perhaps less markedly - factor mobility that usually exists between the regions of a country, together with obvious considerations of practical convenience and of politics, help to explain the universality of single currencies. But perhaps the most important factor that ultimately sustains such practice and pre-empts any serious consideration of separate regional currencies, is the extent of resource transfers which may be available between regions, through, for example, the budgetary process, in order to alleviate the consequences of insufficient flexibility in cost-price structures. The electorate is normally willing to endorse transfers of wealth between regions of its country on a scale much greater than it would transfers to another country.

Unitary currency or fixed-rate arrangements which have been curtailed

Following the break-up of the Soviet Union, the successor states chose to introduce their own independent currencies. In some cases the break from the Russian rouble was precipitated by operational difficulties in obtaining banknotes or in the payments system, or inability or reluctance to pay Russia for banknotes (the new states wished to retain the

seignorage for themselves); or simply by political considerations. But in a longer-term context it is clear that the rouble was not itself a stable currency (though many of the new currencies initially proved even less stable). Moreover, pre-existing mechanisms, explicit or implicit, for economic support among states were discontinued or much diminished; and interdependence in trade etc, though still considerable, was destined to reduce. For all these reasons too, a currency union no longer appeared desirable or viable.

A somewhat different example is to be found in the former French colonies in Africa, which are grouped into two zones, each with a separate currency which endured for many years at fixed rates against the French franc. For a long time these rates were regarded as inviolable, but in 1994, after a mounting struggle with uncompetitiveness, and growing reluctance of France to provide resources on the increasing scale necessary to support the economies in their resultant plight, the currencies were formally devalued by 50%. They remain pegged, however, at the new rates.

Fixed rates adopted via "currency board" mechanisms

Hong Kong introduced its peg to the US dollar in 1983, and in more recent years Argentina and Lithuania have fixed to the dollar and Estonia to the deutschemark, all by means of currency board mechanisms or variations thereof.

In each case the fixed rate was adopted at a time of some crisis, in the hope of restoring monetary stability. Each has held fast (to the time of writing), assisted by the determination of the authorities to maintain monetary discipline, matched by sufficient tolerance of business and citizens to what has in some cases been a fairly painful adjustment process in the short term. In Hong Kong, possessing perhaps the highest degree of flexibility in its economy, the adjustment was the least painful. For the others, with a shorter track record, the long-run durability of the arrangement is still being questioned in some quarters.

Interestingly, in none of these cases did the economy satisfy the sort of preconditions of convergence, relative to the country to whose currency it was fixing, which are being used by the European Union. And

differences in inflation rates from the anchor currencies have persisted, for structural reasons, long after fixing. Of interest also is the fact that the choice of anchor currencies (US dollar or deutchemark) reflected the strength of US and German monetary policy credentials, rather than the closeness of trading relationships or any prospects of receiving material support from those countries.

Prospective currency unions - the ultimate in fixity

Experience within the European Union is that the greatest stability of bilateral exchange rates has been achieved between countries which possess relatively similar economic structures, or where one is dominated by another in terms of size and trade. Thus, for example, the exchange rate between the deutschemark and Dutch guilder has demonstrated considerable long-term stability, despite divergences in those budgetary measurements which are being formally used to judge convergence. EU countries do not in general possess the internal cost-price flexibility, which is desirable as a substitute for exchange rate adjustment, to the same extent as economies in some other regions. Against that, however, there is a strong political will to make a success of the single currency, when it comes; and cooperation in economic policy, including arrangements allowing limited resource transfers between members - a facility which is not generally available to other countries desiring to hold their exchange rates fixed - should help to underpin the unified currency when it is adopted.

11 Official intervention in the foreign exchange market

Under any exchange rate regime other than a completely free float, the central bank intervenes in the foreign exchange market. The extent of such intervention depends upon the particular circumstances.

Any such intervention has the potential to affect monetary conditions in the economy. Consider, for example, the case where there is upward pressure on the exchange rate, which the central bank decides to resist. It purchases foreign currency in the market, and the local currency which it

creates in exchange (eg by crediting the accounts of commercial banks at the central bank) constitutes an addition to the money supply (monetary base); if this is not matched by an increase in the demand for money it implies an easing of monetary conditions and will be associated with a fall in interest rates, which should forestall any further upward pressure on the exchange rate. In cases where there is downward pressure and the central bank sells foreign currency, the consequences are the opposite.

There may, however, be occasions when the central bank intervenes to influence the exchange market but does not wish the money supply to be affected. In that case the central bank may "sterilise" the effect of its foreign exchange intervention on the monetary base. The means by which sterilisation of inflows may be achieved include operations in the money market or government securities market to absorb liquidity, sales of central bank securities, raising reserve requirements for banks or transferring government balances from commercial banks to the central bank.

However, by thus restoring the monetary base (exclusive of any compulsory reserve requirements) to its original position, the original pressures on the exchange rate may simply re-emerge. Alternatively, if sterilisation is effected simply by selling liquid instruments to banks, the potential for subsequent expansion of monetary base or, more particularly, of broader money or credit indicators, and easing of interest rates, may be significant (in which case one might regard the sterilisation itself as having been incomplete).

Generally speaking, the efficacy of sterilised intervention depends on the extent to which economic agents perceive financial instruments of the country in question to be substitutable for those of other countries, and vice versa; the more perfect are they as substitutes, the less effective is sterilised intervention. In practice, inefficiencies in financial markets, considerations of credit risk and, in some instances, official restrictions on capital transactions mean that there is less than perfect substitutability. This is most likely to be true of less developed economies, for which the balance of opinion seems to be that sterilised intervention may (but will not necessarily) be effective, in meeting twin objectives of having the desired effect on the exchange rate while not unduly disturbing domestic

monetary conditions, in the short-term; but that, even so, it may not be a viable long-term strategy.

As regards more developed countries, the probable greater substitutability of domestic and international assets would suggest a still weaker role for sterilised intervention. In those markets, however, the efficacy of any sort of intervention depends very much on whether it can influence the psychology of market participants. It may be possible to do so, particularly when intervention is concerted among more than one central bank. Even then, however, a lasting impact may only be achieved if the authorities make appropriate adjustments to other elements of policy - and that may imply some curtailment of sterilisation itself. Often a shift in intervention strategy may signal an important shift in monetary policy overall.

Sterilisation of inflows is often costly to the central bank (or, depending on the accounting arrangements, to the government), because the central bank acquires low yielding foreign currency assets in exchange for or backed by higher yielding domestic instruments. In the case of sterilisation via an increase in unremunerated reserve requirements, the banks are "taxed" rather than the central bank or government bearing the cost.

The foregoing discussion has been presented in terms of pressure of capital inflows. In principle, the precise converse applies to outflows. In practice, however, the central bank may be less keen to offset (by reverse sterilisation) the monetary impact of outflows than of inflows, because in the case of outflows an adjustment of monetary policy is more often necessary and desirable - for example, tightening monetary policy to combat inflationary conditions which may have precipitated the outflows. An exception would be if the monetary squeeze was so severe as to give rise to serious problems of liquidity or even solvency for banks; in those circumstances the central bank may prefer to sterilise the monetary impact of outflows.

By contrast, the gold standard or a currency board is a very strict version of a fixed rate, under which intervention is automatic "on demand", so far as exchanging base money for foreign currency is concerned, but sterilisation is in effect prohibited. The consequences of

excessive inflows or outflows for domestic monetary conditions may be extreme. The regime is also quite rigid, in that, for instance, it cannot even accommodate a rise in demand for base money associated with growth in the real economy, unless backed by foreign currency.

The Appendix explores further the process of intervention and sterilisation, and the operation of the currency board.

12 Controls on foreign exchange transactions

The majority of market economies aim to provide unimpeded access for all to the foreign exchange market. Some, however, while declaring that to be their long-term goal, maintain a number of controls for the present.

Where controls are practised, they usually apply to capital transactions rather than current transactions (membership of the International Monetary Fund implies a strong commitment to achieve current account convertibility). Some countries wish to prevent their exchange rate depreciating, and so impose controls on capital outflows, usually on the extent to which the country's residents are permitted to export capital or retain foreign earnings abroad. Other countries may be experiencing upward pressure on their exchange rates and so impose controls on capital inflows - for example, on the extent to which foreigners may invest in the country.

The arguments for and against exchange controls may be summarised as follows:

For	Against
1 To reduce scope for short-term volatility in the exchange rate arising from speculative activity.	1 Markets should be allowed to operate without impediment; this is best for the long-run efficiency of resource allocation in the economy; also it ensures that market signals are seen and necessary adjustments made to overall policy, sooner rather than later.
2 To reduce chances of a more persistent misalignment (overshooting) as a result of the very short-term outlook on which foreign exchange markets allegedly concentrate.	2 Operation of controls may cause unfairness or economic distortions between different firms or sectors.
3 To insulate the economy from the potentially serious domestic monetary consequences of sizeable inflows or outflows.	3 Controls are seldom fully effective; and with the passage of time they are progressively circumvented.
	4 There is a significant administrative cost.
	5 Controls may precipitate retaliation from other countries.

Evidence suggests that controls on inflows may be more effective than those on outflows. This is because it may be easier to monitor and control the destinations of capital coming into the country than the sources of funds moving out of the country. Another reason is that outflows are more likely than inflows to be associated with some sort of serious economic crisis, with people perhaps adopting desperate and devious means to evade any controls.

Nevertheless, regardless of differences between inflows and outflows, the consensus nowadays is that in this era of mobile international capital and sophisticated financial institutions and markets, any controls are probably, at most, effective only in the short-term. Moreover, they may encourage or facilitate delay in much needed policy action on other fronts. Medium-term cycles of, for example, apparent undervaluation of an exchange rate followed by apparent overvaluation may in practice be unavoidable, even with the help of strict controls.

13 Concluding remarks

The aim of this *Handbook* has been to present the issues, rather than to reach firm conclusions. The fact that there currently exists such a diversity of exchange rate practices around the world seems to indicate that there is no simple, universal prescription. The choice must depend upon the circumstances of each country.

Nevertheless, a few general points may be noted:

- a fixed rate may be helpful in establishing a monetary framework based on a firm anchor and a visible discipline, although, in a market economy, it necessarily involves surrender of autonomy over domestic monetary policy; tolerance of a fixed rate is likely to be greatest where the economy exhibits the greatest internal flexibility;

- a floating rate provides for independence in domestic monetary policy, but there is always a risk that this independence may be abused, with inflationary consequences;

- if the rate is "managed", there may be more risk, than in cases where the rate either floats more freely or is convincingly fixed, that uncertainty regarding the central bank's tactics or longer-term intentions will give rise to speculative disturbances;

- intervention in the foreign exchange market by the central bank, if unsterilised, will affect monetary conditions in much the same way as

open market operations in the domestic money market - both having the potential, *inter alia*, to influence the exchange rate;

- sterilised intervention may not be very effective in relieving pressure on the exchange rate beyond the short term, although its effectiveness depends to some extent on the structure of financial markets and instruments;

- capital controls may be a more effective means of limiting inflows than outflows; even so, they may not be effective beyond the short term; moreover, they interfere with market forces in the allocation of finance, and run counter to the global trend towards the dismantlement of all forms of official controls over the economy;

- however, in the narrow context of managing the exchange rate, the limitation of certain external capital flows by means of direct controls may in some circumstances be more effective than permitting the flows and then trying to sterilise them.

APPENDIX

The table below is a simplified, stylised presentation of the monetary consequences of central bank intervention and sterilisation. Suppose, initially, that there is a disequilibrium in the foreign exchange market at the prevailing exchange rate, with, for example, investors wanting to switch 100 units from foreign currency into local currency. Under a floating rate regime, this would result in an upward movement of the exchange rate until equilibrium between demand for and supply of the local currency was re-established. But it is assumed here that the central bank is operating a fixed-rate policy. It therefore intervenes to purchase 100 of foreign currency in exchange for 100 of local currency; the latter is credited in the first instance to the balances of commercial banks at the central bank, and the banks then credit the bank accounts of the investors. This is represented at position A.

Selected balance sheet entries	Positions relative to starting position		
	A	B1	B2
INVESTORS			
Assets			
Local currency deposits	+100	+ 100	-
Local currency securities	-	-	+100
Foreign currency assets	-100	- 100	-100
COMMERCIAL BANKS			
Assets			
Balances at central bank	+100	-	-
Local currency securities	-	+100	-
Liabilities			
Local currency deposits	+100	+ 100	-
CENTRAL BANK			
Assets			
Local currency securities	-	- 100	-100
Foreign currency assets	+100	+ 100	+100
Liabilities			
Balances of commercial banks	+100	-	-
MONEY SUPPLY			
Monetary base	+100	-	-
Broad money	+100	+ 100	-

At A, the banks possess increased liquidity. This would, other things being equal, imply a general loosening of monetary conditions and lower interest rates, which would tend to eliminate excess demand for the local currency and so restore equilibrium in the foreign exchange market at the fixed rate. But the central bank may, for other reasons, want to prevent monetary conditions from easing. It may therefore sell securities from its own portfolio (alternative operations to absorb liquidity, such as raising reserve requirements on banks, would lead to broadly similar end-results for the purposes of this exposition). B1 shows the case where these securities are purchased by banks; and B2 where they are purchased by other investors.

B1 is perhaps the most common example of immediate sterilisation, when the central bank, in its regular money market operations, acts to eliminate the surplus balances of banks. But, if the securities sold to the banks are of the type which also qualify for possible subsequent sale to the central bank, the sterilisation may not be fully effective; and, broad money may still be larger than at the outset; so, monetary conditions may remain easier. In B2 the sterilisation is complete, in that both broad and narrow money are returned to their starting positions.

However, the more successful that sterilisation is in restoring the starting position, the more likely are upward pressure on the exchange rate and inflows to recur, so casting doubt on the wisdom of the whole operation. How long the pressure of inflows may persist in such circumstances depends upon the degree of freedom of investors (particularly foreign investors) to purchase or hold local currency assets, and upon how soon investors may regard their portfolios as saturated (as explained in section 11).

In the case of intervention to stop the rate falling in the face of excess demand for foreign currency, the analysis is the precise converse of the foregoing.

In the case of a “currency board” system, the currency board (or central bank) is obliged to intervene to exchange base money for foreign currency at the fixed rate and, if the system is operated in its purest sense,

sterilisation is not an option. Thus the effect of inflows (or with reversed signs, outflows) is constrained to position A, with full feed-through to domestic monetary conditions. In other words, inflows lead automatically to looser domestic monetary conditions and outflows to tighter; a strictly constituted currency board would not involve itself in domestic securities transactions, and would not be permitted to add to monetary base without foreign currency backing.

It is this discipline that both explains the currency board's comparative success in holding the rate fixed, but also leads to potentially severe domestic consequences in terms of, at the macro level, inflation or deflation and, at the micro level, extreme pressures on the banks. In practice, however, central banks which operate a currency board system may possess some authority and means to manage liquidity through money market operations. Perhaps the most serious problem is likely to arise if outflows result in a severe squeeze on banking liquidity, which the central bank may be powerless to relieve by direct injections of liquidity because it lacks the foreign currency resources against which to create base money.

Further reading

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