

BIS ECONOMIC PAPERS

N° 5 – February 1982

**THE THEORY AND PRACTICE
OF FLOATING EXCHANGE RATES
AND THE RÔLE
OF OFFICIAL EXCHANGE-MARKET
INTERVENTION**

by Helmut Mayer

**BANK FOR INTERNATIONAL SETTLEMENTS
Monetary and Economic Department
BASLE**

Table of Contents

Introduction	3
I. Temporary interest rate differentials	6
II. Differentials in inflation rates	14
III. Temporary current-account imbalances	18
IV. Permanent shifts in underlying economic conditions	21
V. More permanent changes in international interest rate differentials	25
VI. Exchange rate behaviour in the real world	29
Conclusions	43

THE THEORY AND PRACTICE OF FLOATING EXCHANGE RATES AND THE RÔLE OF OFFICIAL EXCHANGE-MARKET INTERVENTION

Introduction

After a short spell of relative calm that gave rise to hopes that the initial teething problems of the floating rate system had finally been overcome, the period since the second half of 1977 has again been one of pronounced exchange-market unrest. Some of the exchange rate movements that occurred during this period were undoubtedly justified by changes in basic underlying conditions and were therefore in the interests of longer-term equilibrium. At the same time, however, there can be little doubt that a substantial proportion of these fluctuations was unnecessarily large or even undesirable and entailed on occasion serious conflicts between external and domestic economic policy requirements. Moreover, this instability occurred despite a level of official exchange-market intervention that sometimes dwarfed the amount of intervention that had to be undertaken under the fixed rate system.

This paper seeks to shed some light on the causes of these problems and to evaluate the case for official intervention or other exchange rate policies by comparing how a floating rate system should ideally respond to certain kinds of "disturbances" with the kind of reaction patterns that are likely to ensue in a world of major economic uncertainties and long lags in adjustment. The approach used is a highly pragmatic one. No heroic effort is made to set up a general equilibrium model of exchange rate determination, and the assumption throughout this paper is that prior to the disturbance the

exchange rates were at some kind of longer-term equilibrium level, or were moving along some sort of longer-term equilibrium path.

Section I deals with *temporary* changes in international interest rate differentials. Section II considers the rôle of international inflation differentials. Sections III and IV explore the effects of disequilibria caused by temporary and permanent changes in the underlying real sector of the economy and Section V discusses the scope for more *permanent* changes in real international interest rate differentials. Particular attention is paid throughout to the rôle of the forward markets and the question of the bias of the forward rate structure. Section VI seeks to illustrate some of the points made in Sections I to V by reviewing recent exchange rate experience. A concluding section attempts to sum up some of the findings.

One assumption that is basic to this paper is that unnecessary exchange rate instability, i.e. movements in real exchange rates that do not contribute to the adjustment process and are not in the interests of longer-term equilibrium, entails very real economic costs and should therefore be regarded as undesirable. For one thing, it will distort international competitive conditions, reduce the efficiency of resource allocation and add to general economic uncertainties. In a world in which the setting-up of new production facilities requires large fixed capital commitments, pronounced uncertainty about one of the most important parameters determining the commercial soundness of such investment, namely the country's real exchange rate level, is bound to substantially increase the uncertainty premium that is necessary to justify the risks incurred. Exchange rate instability and the related uncertainties will therefore have a negative impact on the level of investment and economic growth. This will tend to be a problem particularly in the case of smaller countries where import penetration is very high and where, in view of the narrowness of the domestic market, commercial viability will very often depend on the ability to sell a large part of output abroad. Moreover, for firms heavily engaged in international trade, exchange rate instability may mean that the possible losses or gains deriving from exchange rate movements will

dwarf the revenue from the firm's ordinary business. There will therefore be a danger that foreign exchange management and speculation might absorb a large portion of the prime managerial talent and attention that would otherwise be devoted to innovation in the field of production processes, products and new markets.

Finally, in a world of much less than perfect competition, of widespread oligopolistic market structures, on both the input and the output levels, and pronounced price rigidities in a downward direction, exchange rate instability is bound to give a boost to worldwide inflation. While the domestic inflation rate will tend to react very promptly in those countries with depreciating exchange rates, prices in the appreciating countries will be slow to respond and the response will be a rather muted one. Even within one and the same country an exchange rate depreciation that is subsequently reversed is bound to leave domestic prices at a higher level than would have prevailed had exchange rates remained unchanged in the first place. And similar ratchet effects may arise in the field of restrictive trade practices. There is a real danger that protectionist measures taken at a time when an unrealistically high exchange value of the national currency is threatening the survival of certain domestic industries may not be readily unwound when the real exchange rate returns to a more realistic level.

Despite the importance attached to avoiding unnecessary exchange rate instability, this essay is, however, not intended as a plea for a fixed rate system, which, of course, would not afford protection against undesirable *real* exchange rate movements either. It is the author's view that in the present world environment of pronounced economic and political uncertainties a return to a genuine fixed parity system is out of the question. The sole aim of this paper is therefore to explore to what extent the floating should be "pure" and to what extent there is a case for official intervention and/or for subordinating domestic policies to external constraints.

In fact, to anticipate somewhat the conclusions of this essay, the issue of floating versus fixed exchange rates would seem to have been very much overplayed. A genuine fixed rate system would

undoubtedly be feasible in a stable and predictable political and economic environment, in which a pure floating rate system would function very satisfactorily too. Conversely, in a world such as the present one, in which wide inflation differentials and all manner of uncertainties and instabilities preclude a genuine fixed rate system, pure floating is also bound to produce unacceptable results. Thus, the authorities today find themselves in a kind of "no man's land" that may at times combine the disadvantages of both systems, where it is not possible to rely mechanically on a few simple rules but where survival requires the constant exercise of judgement and discretion, although this necessarily entails the risk of error. Of course, all this may not be very palatable to theoretical purists, but the situation here is no different from any other sphere of social relations. While the yearning for simple "black and white" answers to all the complex questions that arise in modern society helps to explain the appeal of ideologies, the simplistic answers and mono-causal explanations offered by these ideologies are usually spurious ones and divert attention from the real problems. There are no simple, ready-made solutions, and truth has to be conquered anew every day. Genuinely fixed parities and pure floating are undoubtedly both very useful as analytical concepts and tools, but neither of the two systems, if applied exclusively, can provide satisfactory solutions to all the problems of international economic relations that arise in the complex and troubled world in which we live today.

I

Temporary interest rate differentials

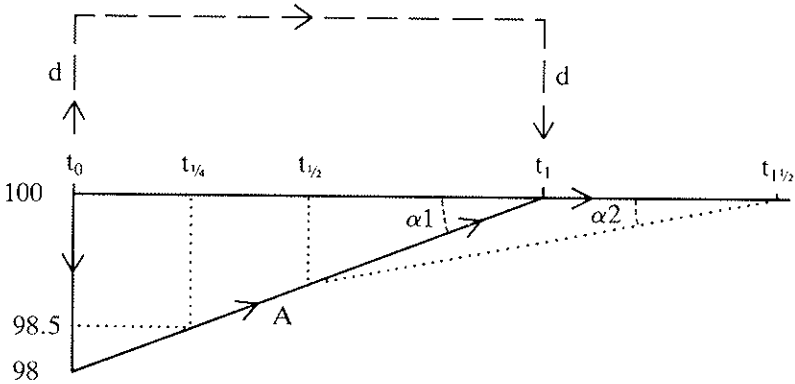
Under a smoothly functioning floating rate system, i.e. in a world of near-certainty in which market participants had a firm, stable and realistic view on the longer-run equilibrium level of the exchange rate, *temporary* and *moderate* international interest rate differentials would not give rise to any major policy conflicts between external and domestic requirements, as exchange rate

movements of *limited* magnitude would act as a substitute for domestic interest rate adjustment. This can be easily demonstrated with the aid of a simple model.

Let us assume that there are two countries, country A, and country B representing the rest of the world; that interest rates in B rise, for example, by 2 percentage points above those prevailing in A; that this interest rate differential will last for one year; and that the other factors affecting country A's balance of payments remain equal so that A's long-run equilibrium exchange rate is not affected. Moreover, unless otherwise stated we shall assume that in the short run exchange rate changes have no impact on current-account balances or on the supply of savings or the demand for investment, which implies that interest rate movements abroad will have no automatic impact on country A's own domestic interest level. Finally, for simplicity's sake we shall ignore the compound interest factor here so that the arithmetical examples can be presented in purely linear terms.

In such a scenario, with international interest rate differentials exogenously determined and the longer-run equilibrium level of the exchange rate remaining unchanged, it will, in line with the interest parity theorem, be solely up to the spot exchange rate to adjust in such a way as to permit a pattern of forward exchange rate premiums (or discounts) that will offset the temporary difference in interest rate levels. Under ideal conditions, this means that a floating rate system would respond to such a decline in country A's relative interest rate level with an immediate 2 per cent. drop in currency A's exchange rate, but with the spot rate, as suggested in the diagram below, gradually returning to its longer-run equilibrium level in the course of the year. In other words, the subsequent gradual appreciation of currency A would compensate for its lower interest yield, since on an annual basis the discount of currency A's spot rate on its longer-run equilibrium level would, at any point on its path back to its longer-term equilibrium level, amount to 2 per cent. Moreover, the exchange rate path, as depicted in Diagram 1, would also correspond to currency A's forward rate structure. On all

Diagram 1



d = interest rate differential in favour of rest of world
 A = adjustment path of spot exchange rate

forward contracts up to the maturity date t_1 (viz. one year in our example), currency A would show a forward premium of 2 per cent. on an annual basis. At point t_0 , for example, when its spot rate was 98, its forward rate for $t_{1/4}$ would be about 98.5, its forward rate for $t_{1/2}$ would be about 99, etc. The fact that currency A's forward rate structure would coincide with its actual future exchange rate path implies that in this highly stylised scenario forward rates would always be an *unbiased* and accurate indicator of future spot rates.

It should be added as a kind of footnote that the time path of the interest rate differential as depicted in the upper half of Diagram 1 is conceivable only for call-money rates. Term rate differentials in the above example would already be beginning to narrow gradually before the date t_1 is reached. For example, the three-month interest rate differential and forward premium would start to decline three months before t_1 , since the maturity date of all subsequent contracts would fall after t_1 . For the same reason, the interest rate differential in the case of one-year contracts would already begin to decline at t_0 ;

by $t_{1/2}$, for example, it would be down to 1 per cent., as would of course the premium on one-year forward exchange contracts (tan $\alpha 2$ in Diagram 1). More generally, the forward premium and the interest rate differential for contracts with a maturity date falling after t_1 would simply be the weighted average of the 2 per cent. differential up to t_1 and the zero differential from t_1 to maturity. This means that in country A the interest yield curve would have a positive slope and that the temporary international interest rate differential would affect mainly short-term interest rates.

The market mechanism which, under the stylised conditions assumed above, would bring about this pattern of exchange rate movements and the corresponding forward rate structure is a familiar and rather simple one. The 2 per cent. increase in the interest rate level outside country A would give rise to covered interest rate arbitrage outflows until the resultant decline in the spot rate and the rise in the forward rate in relation to the spot rate produced a forward premium of 2 per cent. (on an annual basis), which would eliminate the incentive for further arbitrage flows. At the same time, in our model of a world with very little uncertainty, speculation would prevent the spot rate from falling significantly below 98 at point t_0 and the forward rates from rising above the exchange rate path depicted in Diagram 1. For example, if the spot rate fell much below 98 at t_0 , speculators could make a profit by moving into currency A, since the recovery of the exchange rate to 100 per cent. by t_1 would more than compensate for currency A's lower interest yield. Similarly, if arbitrageurs' forward demand for currency A tended to push its forward rate for t_1 above 100, this demand would be met by speculators who could make a profit by forward sales of currency A at a higher price than 100. It should, however, be noted that under conditions of nearly perfect foresight, and with the current-account balance in the short run irresponsive to exchange rate changes, the interest arbitrage flows necessary to restore covered interest parity would be very small, since speculators' demand for currency A at a spot rate higher than 98 would be close to nil, as would their forward supply of currency A at

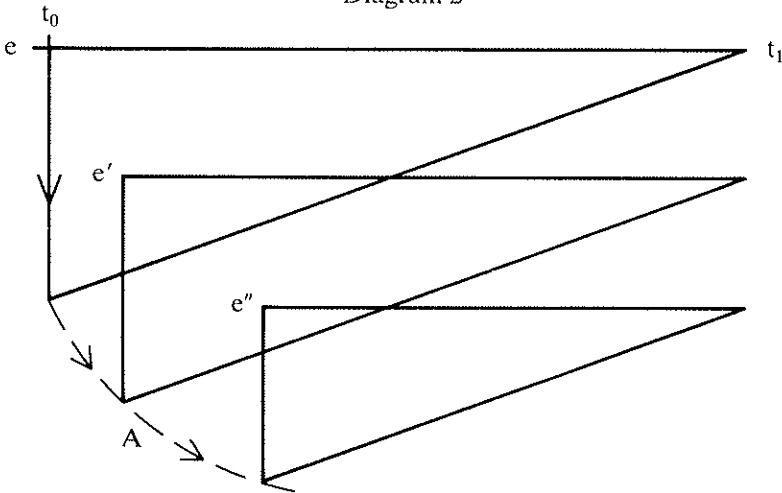
a price below the equilibrium path. This means that the market-makers could adjust the spot and forward rate structure to the new interest differential virtually without any transactions taking place.

To sum up the argument, under ideal conditions the emergence of a temporary negative interest rate differential would lead to a single finite drop in country A's exchange rate, followed by a gradual recovery of the exchange rate to its equilibrium level. While the forward premium or discount would be determined by interest rate differentials, the spot rate would always move in such a way as to make the forward rate quotations an unbiased and accurate predictor of future spot rates.

The most important condition for this "optimal response pattern" to be realised is, however, a highly presumptuous one, viz. nearly perfect foresight on the part of exchange-market participants regarding both the *duration* of the interest rate differential and the *longer-run equilibrium level* of the exchange rate. It need hardly be said that in the present state of the world economy these conditions will hardly ever be met or even approximated. It is doubtful (as we shall argue later on) whether there is actually a determinate longer-term equilibrium level or path of the exchange rate; moreover, the uncertainties with regard to the duration of a given interest rate constellation will usually be very pronounced.

The duration of the interest rate differential is of course of key importance for the shape of the "optimal response pattern". In our numerical example above the spot rate, other things remaining equal, would initially have to drop by more than twice as much if the duration of the interest differential was two years instead of one. But just as important as definite ideas about the duration of the interest rate differential would be a firm view of the future equilibrium exchange rate. If, instead, the necessary fall in the spot rate resulted in downward revisions of the exchange rate expected for t_1 , the spot rate would have to ease one degree further in order to restore to currency A the implied appreciation potential needed to offset its interest rate disadvantage, etc. In that case the future path of the spot rate would be more like the broken line in Diagram 2 and the

Diagram 2



e = expected longer-term equilibrium level of exchange rate
 A = actual exchange rate path

forward rate structure would no longer represent a correct estimate of future spot rates, but would, at least temporarily, display an overvaluation bias. The danger of such repeated downward revisions of exchange rate expectations, and a cumulative decline in the spot rate, would become particularly great if the depreciation resulted in a significant acceleration in country A's rate of domestic inflation or – as a result of J-curve effects – in a temporary deterioration in its current-account balance. A speeding-up of inflation, apart from its negative impact on expectations, would, of course, affect the nominal longer-term equilibrium level of the exchange rate and, because of its impact on resource allocation, probably also the equilibrium level of the real exchange rate as well.

In short, while under ideal conditions the emergence of temporary interest rate differentials would not pose a threat of major exchange rate instability, in the present world setting of imperfect control over inflation and of profound uncertainties with

regard to future economic developments they could trigger excessive and cumulative exchange rate movements. At what point on the scale the response will actually lie between only limited temporary weakening of the exchange rate followed by subsequent recovery, or cumulative decline, will depend in large measure on the underlying strength of the currency concerned. If the currency whose relative interest yield declines is unfavourably viewed to start with – either because of a large current-account deficit, or of inflation proneness etc. – its spot rate may have to fall quite considerably before speculators find that its subsequent recovery potential makes it worthwhile to step in. Conversely, if the currency was thought to be appreciation-prone, it might take only a very slight drop in the spot rate to induce speculators to come in with support. In fact, it is quite conceivable that the decline in the currency's interest rate attractiveness might simply act as a temporary substitute for appreciation and that its exchange rate might show no downward reaction. Thus, in the present world of great uncertainty about future economic trends, virtually anything may happen. As experience with floating exchange rates since 1973 has confirmed (see also Section VI), changes in real interest rate differentials may at times strongly influence exchange rate behaviour, while at other times they may not give rise to any exchange rate movements at all.

Finally, as regards the potential rôle of official intervention in the exchange markets, it is clear that there would be very little room for such intervention in the ideal scenario of nearly perfect foresight on the part of exchange-market participants. Since, under these conditions, any diversion of the spot and forward exchange rates from their "optimal response pattern" would give rise to practically unlimited speculative capital flows, efforts by the authorities to prevent the spot rate from accommodating the change in interest differentials would entail reserve losses (or gains) on a scale that would soon force them to abandon such a policy. Short of direct controls, the only way for the authorities to avoid exchange rate movements under these circumstances would be to prevent the emergence of the interest rate differential to start with.

Perhaps the temptation to forestall the (temporary) decline in the spot rate will not tend to be very great when, as in the above example, the interest rate differential and therefore the required decline is only 2 per cent. But the urge to "stabilise" might become quite strong when the differential is of the order of, say, 5 per cent. and is expected to last more than one year, say for two years. The initial drop in the spot rate then implied by the optimal response pattern would amount to over 10 per cent.; such a drop, despite the favourable forward rate structure for the currency, would already be bound to have a considerable impact on resource allocation, on the domestic pace of inflation and thus on the longer-term equilibrium level of the exchange rate itself. This means that when interest differentials become too large and are expected to last for several years, even a floating rate system cannot provide the monetary authorities with satisfactory insulation from monetary developments abroad. In fact, if the authorities are unwilling to accommodate the temporary spurt in imported inflation and adhere rigidly to a policy of precise monetary targets, interest rates will tend to be pushed up automatically. And unless the tighter credit conditions quickly succeed in pulling down the prices of domestically traded goods there will be bound to be negative effects for domestic employment and economic growth.

The case for official intervention in the exchange markets becomes much stronger in the scenario of widespread uncertainties presented by the current world economic climate. Under these circumstances, when expectations tend to be rather volatile, and when exchange rate movements may therefore foster expectations of a further movement in the same direction and, through their impact on domestic rates of price increases, even be in part self-fulfilling, it can certainly make sense for the authorities to "lean against the wind" once the exchange rate begins to fall too far below the level that can be justified in terms of the temporary interest rate differential. And, even more importantly, the fact that in a world of profound uncertainties speculators' supply (or demand) schedules would be much less elastic with regard to deviations of spot and

forward exchange rates from their imputed equilibrium levels than under conditions of nearly perfect foresight and that there would be bound to be large differences between individual speculators' exchange rate expectations would very much increase the leverage of such official intervention.

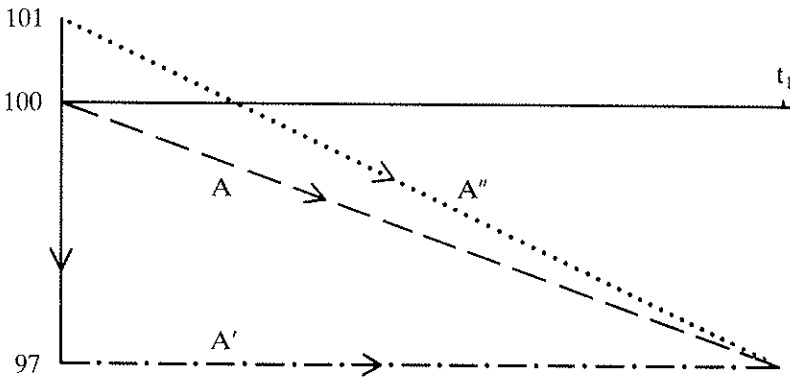
While under conditions of profound uncertainties and resultant exchange rate overshooting there is thus a case for official intervention, it must be stressed that the aim of this intervention should not be to avoid any exchange rate adjustments to start with, but to avoid *unnecessary* instability, which implies that the intervention should increase in intensity the further the exchange rate is pushed away from the realm of reasonableness. Of course, when intervening in the exchange market, the authorities should be convinced of their own determination and ability to adhere to a general economic policy course that makes the implied longer-term exchange rate level a sustainable one.

II

Differentials in inflation rates

A second major reason for movements in nominal exchange rates can be international differences in inflation rates. Let us assume that, while nothing else changes, prices in country A begin to go up by, say, 3 per cent. more at an annual rate than in country B. The first point to be made in this context is that, to the extent that this acceleration in the rate of price increase represents only a nominal phenomenon, it should not affect any real relationships. In particular, in order to avoid a real depreciation, currency A's exchange rate should certainly not drop by 3 per cent. immediately, but should move down gradually so as to offset the increase in country A's nominal price level and to keep real exchange rates constant. At the same time, constant real interest rates imply that country A's nominal interest level should rise by 3 per cent. If these

Diagram 3



A = adjustment path of spot exchange rate

two conditions of constant real exchange rates and interest rates were fulfilled, the equilibrium path of the (nominal) exchange rate would be the diagonal line in Diagram 3. In other words, the downward movement of currency A's nominal exchange rate would compensate for the nominal interest rate premium without affecting real exchange rates. Here again, this path would, at any point in time, be identical with the forward rate structure, which would both fully reflect the nominal interest rate differential and be an unbiased predictor of future spot rates.

If, in contrast, the acceleration of inflation was not accompanied by a corresponding rise in nominal interest rates, the resultant decline in real interest rates would tend to give rise to the same kind of reactions as described in the preceding section. With near perfect foresight and if the 3 per cent. real interest rate differential was to last for one year, the spot rate would immediately drop to 97 and then remain flat during the rest of the year. The real exchange rate would also drop by 3 per cent. to start with, but then recover to its original level in the course of the year, this upward movement compensating for the country's lower level of real interest rates. If,

on the other hand, in order to get inflation under control, the authorities of country A push up nominal interest rates by more than 3 per cent., say by 4 per cent., then the spot rate would initially have to rise (viz. to 101 in our example) before gradually easing to 97 by the end of the one-year period. In all these cases the identity between the actual adjustment path of the spot rate and the forward rate structure as implied by the interest rate differential would be preserved. In short, a change in the inflation differential will have to give rise to immediate exchange rate adjustments only when it is accompanied by a change in real interest rate differentials. Or, in other words, changes in nominal interest rate differentials only should not have real exchange rate consequences.

Here again, these optimal exchange rate response patterns represent a heroically simplified picture of the real world. In fact, uncertainty is a close associate of inflation, which means that, especially in this context, the assumption of nearly perfect foresight on the part of exchange-market participants is an excessively optimistic one. In order to evaluate the level of real interest rates it would be necessary to appraise the path of inflation over the respective interest periods. In the field of longer-term interest rates in particular, this will certainly not be an easy task and opinions about the likely course of inflation may differ widely. Thus, the authorities of country A might be convinced that the acceleration in inflation could soon be brought under control and that it should not be reflected to any large extent in longer-term interest rates. In contrast, exchange-market participants and investors might less optimistically expect continuing high inflation rates with the result that in their view the modest upward adjustment in longer-term interest rates might be too small to compensate for the expected fall in currency A's nominal exchange rate. Moreover, given the uncertainties about inflation and the ability to control it, investors might be willing to shift into the more inflation-prone currency only if its (expected) real interest yield contains a substantial risk premium. For these reasons, the acceleration in country A's rate of inflation, even if in the eyes of the authorities it is offset by an

appropriate increase in nominal interest rates, might result in an immediate drop in the spot exchange rate. Here again, the impact of this real depreciation on country A's inflation rate and the J-curve effects may make the downward movement self-fulfilling and raise the danger of cumulative exchange rate decline.

Of course, the opposite scenario is, as already indicated, also conceivable. If, through its impact on the behaviour of the domestic monetary aggregates, an acceleration of inflation induces the authorities to push up not only nominal but also real interest rates, it is the country experiencing an acceleration in its inflation rate which may witness an immediate appreciation of its currency. The likelihood of this happening will, of course, be particularly great if the country's balance of payments is initially very strong, so that in cost and price terms it could in any case afford some deterioration in its competitive position. In fact, the J-curve effects of the resultant real appreciation may subsequently seem to corroborate this impression, thereby entailing the risk of excessive upward movement and carrying the seeds of future instability. Moreover, in contrast to the highly simplified scenario depicted at the beginning of this section, the imputed real interest rate differential will usually be expected to last not just for one year, but as long as the inflation differential persists. In that case, even on strictly rational grounds, the movement in the spot exchange rate necessary to compensate for the differential in real interest rates might be very large indeed.

Finally, it must of course be recognised that, in contrast to the assumption made in the first paragraph of this section, inflation is hardly ever a purely nominal phenomenon. On the contrary – and this is the reason why the authorities have to worry about it – inflation and the official policy efforts to fight it usually give rise to major redistributive and allocative effects, and these effects are bound to have some impact on the equilibrium level of the country's real exchange rate as well. Since, however, this impact of inflation and of anti-inflationary policies on the real sector, such as income distribution, employment, investment and economic growth, are very hard to predict, an acceleration in inflation and widening

inflation differentials are certainly among the most important factors that make it very difficult for market participants to form a realistic opinion about both the longer-run equilibrium level of the real exchange rate and the equilibrium path of the nominal exchange rate. Thus, while inflation will make recourse to a floating rate system unavoidable, the uncertainties associated with inflation will also be among the most important factors that impair the efficient functioning of such a system.

As regards the rôle of official intervention, the conclusion would seem to be the same as in the preceding section. Under ideal conditions, with few uncertainties and near-perfect foresight on the part of exchange-market participants, there would be hardly any useful rôle for official intervention to play, even if this might, under certain conditions, mean that because of a rise in its real interest level it is the currency of the country with the higher inflation rate that will show some appreciation to start with. However, in a world fraught with uncertainties regarding the future course of inflation and thus "real" interest rates, situations may well arise in which official intervention could make a contribution towards dampening unnecessary exchange rate movements and avoiding the build-up of new future disequilibria as well as unwanted side-effects on domestic rates of price increases. Moreover, with the requisite amount of intervention being at times very large and perhaps not always conveying the right kind of signals, the authorities may not be able to avoid having to adapt their policies to take account of external considerations even if this is not wholly consistent with domestic policy requirements.

III

Temporary current-account imbalances

Transitory shifts in a country's current-account balance or in its capital balance are the types of (ex ante) "disequilibria" with which a floating rate system has to cope virtually on a daily or even hourly

basis. However, there are situations, e.g. as a result of a change in a country's relative position in the international business cycle, in which this kind of disequilibria can become quite large and sustained over a considerable period of time. In this case the necessary accommodating balance-of-payments flows may have to be very substantial. In the absence of official exchange-market intervention, and with the current account showing little positive response to exchange rate changes in the short run, or even displaying a J-curve pattern, the restoration of "ex ante" balance in country A's external payments will depend entirely on equilibrating speculative capital flows.

The mechanism which will induce these equilibrating capital flows is a change in expected relative yields brought about by a temporary departure of the spot exchange rate from its longer-term equilibrium level, with the resultant exchange rate path and the forward rate structure similar to that depicted in Diagram 1 (page 8). For example, in the case of a temporary deterioration in country A's current-account balance, its spot exchange rate will have to decline somewhat below its longer-term equilibrium level to make it a sufficiently attractive investment for speculators.

Here again, the balancing mechanism will tend to function very efficiently in a world of few uncertainties and near-perfect foresight. Under these conditions even a very small decline in country A's exchange rate below its longer-term equilibrium level will render currency A sufficiently attractive to induce the volume of accommodating capital inflows necessary to finance the country's temporary external payments shortfall. Speculation will produce these inflows in two ways: firstly, through uncovered spot investment in currency A; and secondly, through forward purchases of currency A that will tend to push its forward quotations back up towards its longer-term equilibrium exchange rate level, thereby bestowing on it a covered interest rate premium. In fact, with near-perfect foresight, the extent of the temporary decline in the spot rate below its longer-term equilibrium level would be limited by the size of the covered interest premium needed to set the arbitrage inflows

in motion. This amounts to saying that the necessary decline in the spot rate would actually be very small and could not very much exceed the transaction cost of covered interest arbitrage.

Under conditions of considerable uncertainties, however, this narrow limit on the size of the forward premium would not contain the decline in currency A's spot rate, since speculators might be willing to buy the currency forward only at rates substantially below its longer-term equilibrium value. Under these circumstances, the resultant forward rate structure would no longer be an accurate predictor of future exchange rates, and the longer-run maturities in particular would probably display an undervaluation bias.

It should be noted that in such situations of temporary external payments disequilibria a necessary condition for the efficient functioning of the balancing mechanisms under a pure floating rate system will be a sufficiently high degree of international capital mobility and an absence of controls on short-term capital movements. Contrary to widely held views, this is even true in a world of pronounced uncertainties and rapid changes in underlying situations. Without official intervention, and with current-account balances very slow to respond to exchange rate changes, hardly anything but these speculative capital flows (or interest arbitrage flows made possible by speculation) could restore exchange-market equilibrium. In fact, a temporary deterioration in a country's balance of payments could, in the absence of official intervention, lead to a cumulative decline in its exchange rate even without any destabilising capital flows; all that is necessary for such a downward spiralling of the exchange rate would be an absence of stabilising speculation.

At the same time, in a world of strong uncertainties, when expectations tend to be rather volatile, there is of course also the danger that, instead of exerting a stabilising influence, a high degree of international capital mobility may temporarily aggravate exchange rate fluctuations. For example, if currency A's exchange rate has to fall quite considerably before speculators feel that the chance of a return to its former level more than justifies the risks of

investing in it, it is not too unlikely that the drop in the exchange rate might, from a certain point on, give rise to expectations of further decline and destabilising capital outflows. In short, while in the absence of official intervention a sufficient degree of international capital mobility will be a necessary condition for the efficient functioning of a floating rate system, it may at times itself be a major contributor to exchange rate instability.

The danger of cumulative depreciation may be particularly great when the temporary deterioration of a country's current-account balance coincides, as tends to happen quite often in the context of the business cycle, with a (temporary) acceleration in its rate of inflation. In this situation it will be particularly difficult for exchange-market participants to evaluate the currency's longer-term exchange-market prospects, and massive official exchange-market intervention and/or a sharp turn-round in domestic monetary policy may be the only way to prevent an excessive decline in the exchange rate.

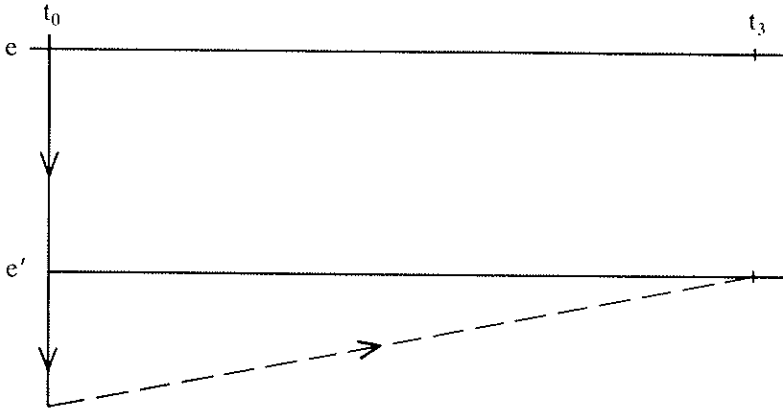
On the other hand, changes in a country's relative cyclical position will, from the point of view of their balance-of-payments consequences, often influence the current-account balance and the capital balance in opposite directions. Thus, a situation of tight demand and a weak current account will often be one of high domestic interest rates, with the result that the temporary worsening of the current balance may be automatically accommodated by an interest rate induced increase in capital inflows.

IV

Permanent shifts in underlying economic conditions

It is conceivable that there may be certain developments, such as the advent of new and more dynamic competitors, that call for a permanent adjustment in a country's real exchange rate. In a world such as the present one, where a considerable amount of time tends to be necessary before depreciation is *fully* reflected in an

Diagram 4



e' = new long-term equilibrium level of exchange rate

improvement in the current-account balance, an external payments disequilibrium induced by such an irreversible change in underlying conditions will require two strata, so to speak, of exchange rate adjustment. Firstly, the exchange rate will have to fall to its new longer-run equilibrium level. And secondly, in order to attract the capital inflows which will be necessary to bridge the time-span between the fall in the exchange rate and the date when it produces its full impact on the current-account balance, there will have to be an additional, temporary decline below the longer-run equilibrium level so as to bestow on the currency (along the lines explained in the preceding section) a sufficiently large yield premium.

This at least is how the adjustment pattern would look in a world of nearly perfect foresight and economic stability. In the present state of the world economy, however, it is not very likely that the actual response pattern will come very close to this ideal since this would require particularly great forecasting skills on the part of exchange-market participants. They would have to evaluate how much of a real exchange rate cut would be needed to restore current-

account equilibrium. They would have to have an idea of how long it would take for the current balance to benefit fully from the depreciation and the resultant improvement in the country's international competitive position. And since the time-span is usually quite long and the *ceteris paribus* assumption hardly ever applies in the real world, they would also have to form some judgement about new developments which might affect the longer-run equilibrium level of the exchange rate in the meantime.

The task of evaluating the longer-term equilibrium level of the exchange rate will be a particularly difficult one when exchange rate movements are to some extent self-fulfilling and, through their impact on domestic inflation rates, seem to validate themselves *ex post*. In that sense, the longer-term equilibrium level of the exchange rate would actually be indeterminate since it would be influenced by the exchange rate movements themselves. This of course applies primarily to nominal exchange rates; but since inflation and the policy responses to which it may give rise usually have an impact on real interest rates, resource allocation and the real sector of the economy, the longer-term equilibrium level or path of the real exchange rate may also be affected by temporary movements of the nominal exchange rate.

What makes it even more unlikely that the adjustment mechanism will function smoothly in the case of a permanent shift in the parameters is that the time dimension involved in evaluating the new longer-term equilibrium level of the exchange rate would seem to go far beyond the horizons of most exchange-market "makers", participants and speculators. As regards the banks themselves, the necessary longer-term position-taking would be viewed in many instances as too dangerous, or even as unethical, and in several countries the taking of open foreign exchange positions by banks is either narrowly circumscribed or ruled out almost entirely by official regulations. Even in countries where there are no such regulations, the banks' open foreign exchange positions may tend to be of an extremely short-term nature, being limited to the minimum that is necessary for the efficient conduct of their daily exchange-market

business, so that nearly all of these open positions may be unwound by the end of the business day. Moreover, exchange-market participants are primarily interested not in guessing the "right" exchange rate level but imminent exchange rate movements. They are therefore interested in the fundamentals mainly to the extent that these may influence the behaviour of other exchange-market participants or have an immediate direct impact on the demand and supply constellation in the exchange market.

What is more, since both the size of earning margins and turnover tend to be positively correlated with exchange rate instability, the market-makers will have no vested interest in exchange-market stability. Rather than seeking the longer-term equilibrium rate, they will be happy to ride the tide wherever it goes, particularly when they feel that they can change horses in time and will also be able to profitably ride the tide on its way back later on. It may therefore not be too surprising that the market-makers sometimes number among the staunchest supporters of a pure floating rate system, and in fact there has been a tendency in recent years for foreign exchange earnings to account for an increasing share of banks' revenues.

In short, in the case of a major permanent shift in the parameters determining exchange rate equilibrium, a smooth and efficient adjustment process would, without official policy support, seem to be highly unlikely in present conditions. And here again, the risk that in the above example the downward movement of the exchange rate might become cumulative as J-curve effects and inflationary repercussions induce yet further downward adjustments in the expected longer-term equilibrium exchange rate will be particularly great. In many cases, therefore, the authorities of country A will themselves have to form some judgement about what could be a reasonable longer-term equilibrium level of the exchange rate and start to provide some kind of support and policy backing once the exchange rate falls too far below this level.

It may be added that in a longer-term framework there may be a considerable danger that exchange rate overshooting could produce

exchange rate and balance-of-payments cycles of large and possibly increasing amplitudes. In the above example, an exaggerated fall in currency A's exchange rate below what could be regarded as its longer-term equilibrium could, if it lasts long enough, have major repercussions on resource allocation and international market shares, which could after several years give the country an excessively strong current-account position. This could then be the beginning of cumulative appreciation and overshooting in an upward sense, thereby sowing the seeds of new disequilibria. In the field of exchange rates and current-account balances, this danger of longer-run instability may be particularly great, since by comparison with the kind of response lags that tend to produce the famous pig-cycle, for example, or the general business cycle, the lag in the full response of current-account balances to exchange rate changes may be a particularly long one. Moreover, in view of the huge number of economic and political factors that affect exchange rates, forecasts in that area are exceptionally difficult to make and are enveloped in an especially dense cloud of uncertainty.

V

More permanent changes in international interest rate differentials

A permanent change in a country's real interest rates relative to those prevailing abroad is in a way the most difficult scenario to approach analytically, since in a world of near certainty it is inconceivable. At first sight it might appear that if a country's interest rate level declines in relation to that of the rest of the world, the ultimate improvement in its current-account balance engendered by the depreciation in its real exchange rate would compensate for the higher level of capital outflows. However, as long as the interest rate differential persists, this kind of adjustment would still leave the

problem of an inconsistent forward exchange rate structure. Since, after its initial drop, the spot rate would remain constant, forward sales of the currency by speculators would theoretically become infinitely large once the forward rate began to show a significant premium over the spot rate. On the other hand, the absence of an adequate forward premium would assure interest arbitrageurs of a risk-free profit on an unlimited volume of capital exports, which means that the downward pressure on the spot rate would continue ad infinitum. The fact that lasting international interest rate differentials are inconsistent with an unbiased pattern of forward exchange rates necessarily leads to the surprising conclusion that under ideal conditions of nearly perfect foresight, full freedom of capital movements and an absence of political risks, a floating rate system would not permit a country to maintain permanently an interest rate level significantly different from that of the rest of the world. Although this conclusion is of course in full harmony with the classical model of an international economy in which long-term capital flows eliminate international interest rate differences and shape the pattern of current-account balances, it seems to be a far cry from the real world.

The equilibrium mechanism which in the absence of official intervention would, in a world of near-perfect foresight, restore exchange-market equilibrium and a consistent and unbiased forward rate structure would work via the current-account balance on the level of domestic interest rates. Thus, currency A's exchange rate would depreciate until the resultant current-account surplus finally became so large that, through its downward impact on the supply of savings available for domestic use and possibly its upward impact on domestic investment demand, it would pull up the country's interest rates to the international level. It is therefore not the improvement in the current-account balance as such, but the interest rate effects of the increase in real capital exports implied by it, that will provide the adjustment mechanism. Official efforts to keep interest rates low while maintaining the exchange rate would perpetuate the exchange-market disequilibrium virtually indefinitely.

This amounts to saying that even under a floating rate system the authorities would in the long run have no autonomy with respect to the choice of the longer-term real interest rate level. All that would be possible would be relatively short-term deviations from the internationally determined level. In the present world institutional set-up where, owing to the rôle of the US dollar as the base money for the rest of the world and the size of the US domestic markets, US domestic monetary policy is largely free from external constraints, this would mean that even under a system of pure floating the real international interest rate level would be largely determined by US interest rates.

However, whereas with the kind of imbalances discussed under the preceding headings it was rather the imperfections of the markets and general uncertainties that prevented the authorities from reaping the full benefits of a floating rate system, in the field of long-term international interest rate differentials it is these very same imperfections and uncertainties that will afford the authorities a certain degree of autonomy. With only very limited foresight, it is in fact unlikely that, once the exchange rate has fallen far enough to produce a substantial improvement in the country's current-account balance, a nearly infinitely elastic forward supply of the currency by speculators would prevent the emergence of forward premiums large enough to restore covered interest rate parity, and to prevent further interest rate arbitrage outflows, even though the exchange rate forecast implied by this forward rate structure may be an unrealistic one.

It is thus conceivable that a forward premium could develop that would be a systematically biased predictor of future spot rates. The fact that under these circumstances the forward rates, at least for the longer maturities such as six months or more, would be consistently higher than actual future spot rates would not cause any problems for interest arbitrageurs and it would certainly please speculators who could regularly make their profits. In a world of strong risk aversion and pronounced uncertainties, a situation in which forward rates showed an overvaluation bias could continue for a fairly long

time, at least if the interest rate differentials, and therefore the forward overvaluation bias, were not too large. Moreover, in such a world the spot rate level would in any case not be a very stable one, so that speculators would on occasion just break even or make losses, although over time they would be sure to average profits proportional in size to the width of the interest rate differential.

Furthermore, the lasting international interest rate differentials may be primarily limited to the long-term sector. In this sector uncertainties about inflation make it very hard to evaluate the true level of real interest rates and interest rate differentials; moreover, no well-developed forward markets exist for long-term maturities; and, finally, portfolio constraints and the presence of various kinds of prudential risks – whose assessment is necessarily highly subjective – prevent interest arbitrage from playing such an important rôle as in the field of liquid short-term assets.

On the other hand, this uneasy equilibrium might give rise to other kinds of distortion. Thus, the alignment with international interest rates in the short-term sector combined with autonomy in the longer-term maturity range would, in the above example, mean that country A's yield curve would become less steep than that of the rest of the world or would even show a negative slope. As a result, longer-term yields might no longer make adequate allowance for the greater uncertainties connected with longer-term investments. The resultant diversion of savings to shorter-term instruments and the concomitant interest rate effects would themselves tend to lead to further downward exchange rate pressures and/or exert upward pressure on longer-term interest rates, which the authorities would have to offset by means of a kind of "operation twist", i.e. by restructuring their own borrowing towards the short-term maturities.

In short, in contrast to the scenario of nearly perfect foresight, the operation of a floating rate system in a world of major uncertainties would not seem to preclude long-lasting real international interest rate differentials. This, however, is not to deny that the initial depreciation of a currency's spot rate in response to

an unfavourable movement in interest rate differentials might threaten to become self-sustaining, as in the case of the other types of disequilibria discussed in the previous sections. It is in fact quite possible that it would take a very substantial amount of official intervention before the spot exchange rate stopped its slide and forward rates began to assume that benign biased pattern that would allow the country to maintain indefinitely a relatively low domestic longer-term interest rate level.

VI

Exchange rate behaviour in the real world

The graphs on the following pages seek to illustrate, with reference to the development of certain key exchange rates, some of the points that have been discussed in the preceding sections.

The graphs, which are divided into three parts, trace three basic influences conditioning exchange rate behaviour: current-account balances (bottom part), nominal and real interest rate differentials (middle part) and the inflation differential (top part), as well as the interaction of these factors with the development of nominal and real exchange rates (top part). The top part of the graphs, moreover, provides a comparison between forecast exchange rates (i.e. three-month forward rates) and actual spot rates for the respective dates. Finally, the middle part of the graphs permits a comparison between interest rate differentials and forward rate biases.

Needless to say, this form of presentation suffers from a number of imperfections. The most serious problem probably concerns the choice of an appropriate price deflator for the purposes of computing real exchange rates and real interest rates. Unfortunately, a certain degree of arbitrariness in this area is unavoidable. The method adopted here was to use consumer price indices – firstly, because of the fairly good statistical quality; secondly, because it would seem to be the price variable on which exchange-market attention is most strongly focused; thirdly, because

the movement of the consumer price index may have a strong influence on wage claims; and fourthly, because consumer prices are less strongly influenced by exchange rate movements than industrial wholesale prices and export and import price indices. The main drawback in using the consumer price index is that it is certainly not a reliable indicator of the development of countries' international competitiveness and, in this respect, the "real" exchange rates obtained in the graphs with the aid of this deflator may in some respects be rather "unreal" ones.

Similar reservations apply to the use of the consumer price index for the computation of "real" interest rates. Moreover, there is the question of which inflation period should be used for deflating nominal interest rates. In an *ex post* sense, the inflation period should probably be identical with the interest period. But in an *ex ante* sense, which is more relevant in this context, the future rate of inflation over the life of the interest contract is not known and, as in most fields, past inflation rates will be used by market participants as a guide for evaluating real interest rates. The method adopted here attempts to take into account the influence of both experience and anticipation by using a six-month centred annualised rate.

Another problem relates to the choice of the appropriate interest rate differential. Ideally, a whole range of interest rates and the whole maturity spectrum should be taken into account. However, for simplicity's sake, only one differential was chosen here, viz. that between three-month Euro-deposit rates for the currencies concerned. These rates have the advantage of a high degree of homogeneity, but the disadvantage that their movements may not always exactly mirror interest rate developments in the domestic markets of the two currencies. Finally, the relevance of these comparisons may be impaired by the fact that the development of the bilateral exchange rates shown in these graphs may be influenced by developments in third markets. Similarly, the movements in current-account balances will not only be affected by these bilateral exchange rates, but also by movements in multilateral weighted exchange rates.

Nevertheless, despite all these imperfections and shortcomings, it is hoped that these graphs will give a very rough idea about some of the factors influencing exchange rate movements and the efficiency of exchange-market performance.

Starting with the Deutsche Mark/dollar rate, and leaving aside the most recent months, it is possible to distinguish three stages in exchange-market developments for the period depicted in the graph: the period of pronounced dollar weakness from the spring of 1977 to late 1978; the year 1979 when the dollar began to show signs of recovery; and the period of dollar strength from early 1980 up to August 1981 (Graph 1).

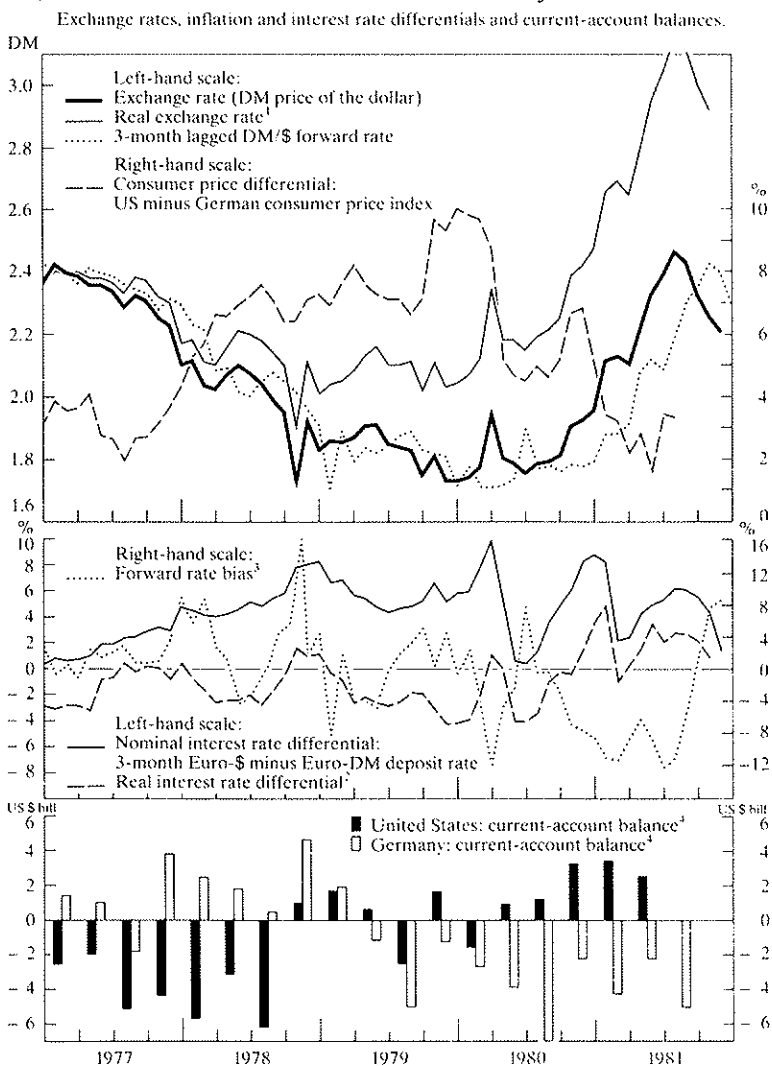
The graph on the following page shows that in the first period three influences worked against the dollar and for the Deutsche Mark: a widening inflation differential, a sharp worsening of the US current-account balance and, during parts of 1977 and 1978, real interest rate differentials in favour of the Deutsche Mark. Under these circumstances, it may not be too surprising that after a while the downward movement of the DM/\$ spot exchange rate began to exceed the inflation differential between the two countries.

In the earlier part of 1977 a widening of the nominal interest rate differential in favour of the dollar secured a forward rate structure that was consistent with the downward path of the dollar's exchange rate, and up to the end of the third quarter of 1977 three-month forward rates proved to be fairly accurate predictors of future spot rates. This situation began to change in the fourth quarter of 1977, when the drop in the DM price of the dollar began to accelerate. The nominal interest rate differential in favour of the dollar no longer implied sufficiently low forward dollar quotations and, with the exception of a period around mid-1978, the forward rates consistently gave too optimistic a forecast of the future DM price of the dollar.

After the decline in confidence in the dollar had led to a near collapse on the exchange markets, in the final two months of 1978 a comprehensive official dollar support package, together with heavy official intervention in the exchange markets, finally succeeded in

Graph 1

United States and Germany



¹ Exchange rate adjusted for relative development of US and German consumer price indices.

² Interest rate differential adjusted for consumer price differential.

³ Difference between lagged forward rate and actual spot rate expressed as a percentage of spot rate.

⁴ Figures not seasonally adjusted.

stemming the tide of adverse expectations. By the beginning of 1979 the dollar was again able to stand on its own feet. With nominal interest rate differentials strongly in its favour and in the absence of strong expectations of further exchange rate deterioration, the dollar improved substantially, particularly in real terms, despite very appreciable official intervention to mitigate the uptrend. The authorities' scepticism regarding undue dollar euphoria was proved valid when the dollar again came under considerable pressure in the exchange markets around mid-year. The US current account had by then improved markedly, but the market again became worried about the US inflationary outlook, while German domestic monetary policy was increasingly geared towards fighting inflation.

It was not until early 1980 that the sharp deterioration of the German current account and the relative strength of the US current account (both undoubtedly partly due to the earlier overshooting of the exchange rates), belief in the new US Administration's determination to bring inflation under control, and various other world economic and political factors began to free the Deutsche Mark and the dollar from their auras of chronically appreciation-prone and depreciation-prone currencies respectively. Market participants apparently then began to feel that some upward adjustment of the real exchange rate of the dollar was warranted and, despite the continuing inflation differentials, were no longer convinced that the much higher dollar interest yields would be offset by further exchange rate depreciation. As a result, the nominal, rather than the real, interest rate differentials began to dominate exchange rate developments. Except for an interruption caused by the temporary plunge of US interest rates in the spring of 1980, the dollar consequently started to rise steeply and, despite heavy official intervention nearly throughout this period, its real exchange rate in the summer of 1981 stood far above the level of early 1977. Here again, the exchange rate movements seem to have nourished expectations of further movements in the same direction, and by the time forward exchange contracts came to maturity, the implied exchange rate forecasts were totally out of line with current

thinking. Thus, except for a brief intermezzo around mid-1980, three-month forward rates for the dollar consistently displayed a strong undervaluation bias.

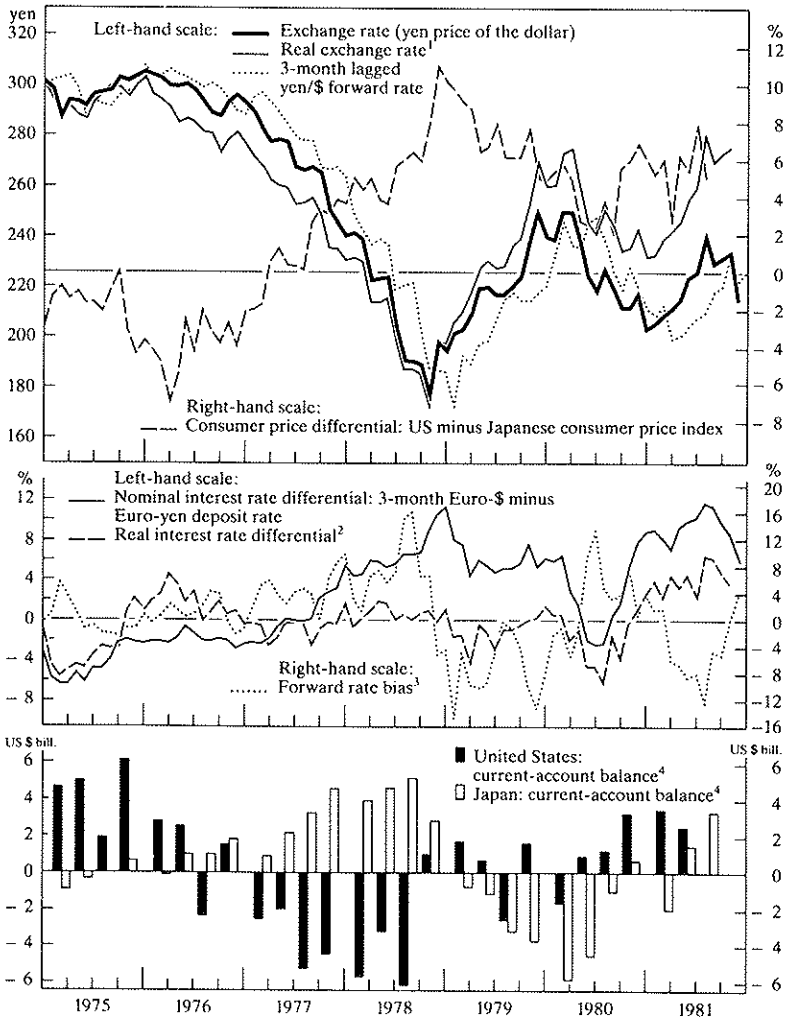
In the same way as the DM price of the dollar, the yen/dollar exchange rate did not simply passively mirror the inflation differentials between the two countries but produced strong movements of real exchange rates which at times seem to have acquired a life of their own (Graph 2). The sharp appreciation of the yen by nearly 70 per cent. in real terms (shown in the graph as a 41 per cent. depreciation of the dollar) from the beginning of 1976 to October 1978 helps to illustrate this kind of behaviour. The main reason for the initial strengthening of the yen in 1976 was an improvement in Japan's current-account balance, whereas inflation and real interest rate differentials seemed to speak for the dollar. However, by the second half of 1977 the favourable impact of the yen's appreciation on domestic price stability and J-curve effects, together with a change in relative cyclical conditions, had shifted inflation differentials and current-account balances strongly in Japan's favour, thereby boosting expectations of further yen appreciation. As a result, the rise of the yen gained further momentum and in 1978 it took heavy official intervention and other policy measures to prevent the situation from becoming explosive and to finally turn the tide.

Nominal interest rate differentials had begun to move in favour of the dollar in the second half of 1977. While it was of little avail in the first nine months of 1978, the dollar's nominal interest premium became the dominant exchange-market influence once official action had succeeded in turning the tide of market sentiment, since, in view of the strong appreciation that had already occurred, there seemed to be little likelihood of further yen appreciation despite the much lower inflation rate in Japan than in the United States. As a result, the yen began to ease sharply against the dollar and despite large-scale official intervention and a number of other support measures was back in real terms to its early-1977 level within a period of little more than twelve months. This exaggerated reaction to the

Graph 2

United States and Japan

Exchange rates, inflation and interest rate differentials and current-account balances.



¹ Exchange rate adjusted for relative development of US and Japanese consumer price indices.

² Interest rate differential adjusted for consumer price differential.

³ Difference between lagged forward rate and actual spot rate expressed as a percentage of spot rate.

⁴ Figures not seasonally adjusted.

preceding appreciation bestowed on the yen a massive competitive advantage, particularly over the European currencies, which during that period held steady or appreciated even further against the dollar. The resultant drastic change in international competitive positions and the repercussions on market shares were subsequently a forceful influence behind mounting protectionist pressures.

Here again, the depreciation of the yen, through its inflationary impact on domestic prices and its contribution, via J-curve effects, to the deterioration of the current-account balance, reinforced the downward momentum of the exchange rate. Given the large nominal interest premium of the dollar, forward exchange rates during this period were way out of line with actual exchange rate developments and the overvaluation bias of the yen at times exceeded 10 per cent.

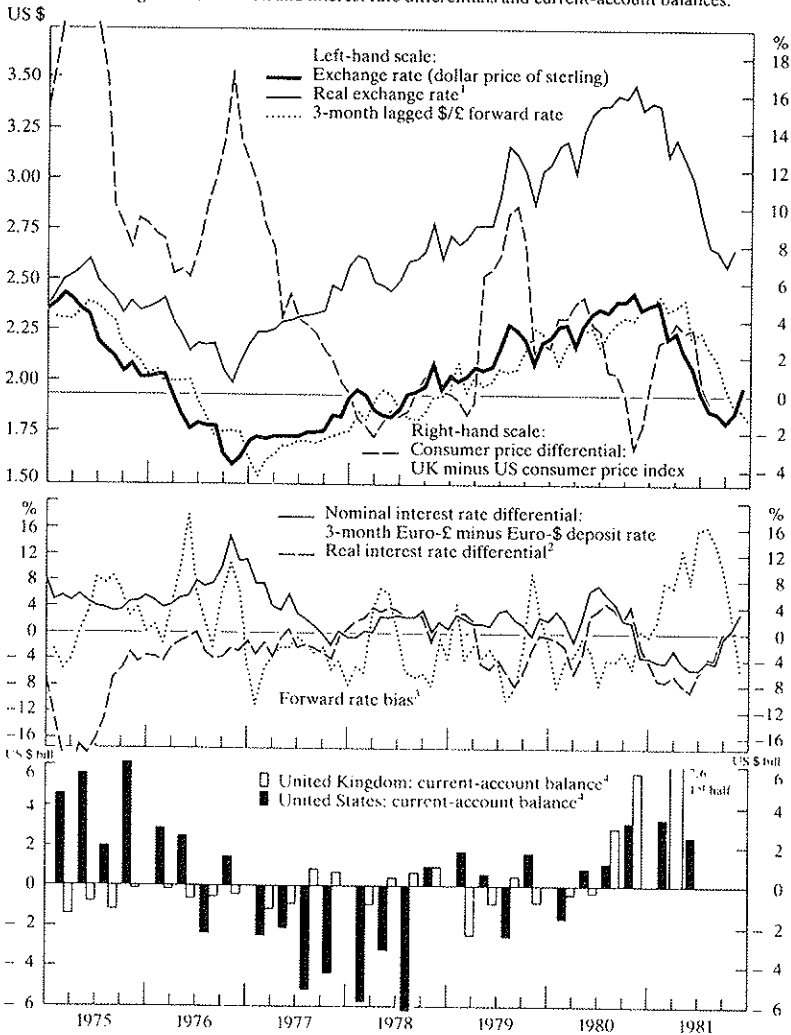
A sharp hike in Japanese interest rates, a pronounced slowdown in the domestic economy and the inflation rate, and, with some delay, signs of an improvement in the current-account balance led in the last nine months of 1980 to a significant recovery in the yen rate. But 1981 brought renewed weakness and by the summer the yen was back in real terms to where it had been in late 1976.

The development of the sterling/dollar rate since 1975 also seems to provide evidence of self-perpetuating exchange rate movements (Graph 3). While the depreciation of sterling in the course of 1975 was undoubtedly justified in view of the weak current account, a wide inflation premium and a negative real interest rate differential vis-à-vis the dollar, in 1976 the deterioration of the sterling exchange rate threatened to get out of hand, although by this time the UK current-account balance had shown signs of improvement and the real interest rate differential in favour of the dollar was much smaller than the year before. In nominal terms, sterling commanded a very substantial interest rate premium vis-à-vis the dollar throughout 1975-76, but the implied downward slope of the forward exchange rate pattern was flatter than the actual slide of sterling and forward rates were therefore nearly consistently off the mark, in view of the further deterioration of the market climate. Here again, it took

Graph 3

United Kingdom and United States

Exchange rates, inflation and interest rate differentials and current-account balances.



¹ Exchange rate adjusted for relative development of UK and US consumer price indices.

² Interest rate differential adjusted for consumer price differential.

³ Difference between lagged forward rate and actual spot rate expressed as a percentage of spot rate.

⁴ Figures not seasonally adjusted (OECD estimates, 1981, 1st half).

massive official intervention and drastic support packages to stop the cumulative worsening of expectations and finally produce a turn-round in market sentiment in the autumn of 1976.

Once the markets were no longer convinced of a further decline in sterling, it was the nominal and not the real interest rate differential which became the dominating influence on the exchange rate. Since the downward forward rate schedule implied by sterling's high nominal interest premium no longer corresponded to market expectations, it now took heavy official intervention to brake the upward reaction of the currency. However, owing to the favourable UK oil situation and temporarily lower domestic inflation rates, sterling continued to be strong even after the nominal interest rate premium in its favour had largely disappeared in the second half of 1977. Here again, the persistent appreciation of sterling in the subsequent three years seems to have taken most market participants by surprise and the rather flat, or even slightly negative, forward rate schedule mostly gave too pessimistic a picture of future sterling exchange rates; obviously, the upward movement of the spot rate was paralleled by an ex post upward revision of expected future sterling exchange rates.

The turn-round in the exchange market in early 1981 came after a four and a quarter years' climb of the spot rate and domestic inflation rates which were mostly higher than in the United States had led to a dramatic appreciation of sterling's real exchange rate vis-à-vis the dollar. It was undoubtedly the realisation that sterling was overpriced, in spite of the oil boon, which made the newly emerging nominal and real interest premium of the dollar the dominant exchange rate influence, and, notwithstanding a strong improvement in the UK current account and a slowing domestic inflation rate, sterling began to turn down. The positively upward-sloping forward rate schedule implied by the negative interest rate differential vis-à-vis the US dollar was, under these circumstances, a totally unrealistic one, with the overvaluation bias of three-month forward rates ranging between 8 and 16 per cent. (on an annual basis) in the summer of 1981. In fact, it testifies to the prevailing

degree of uncertainty in the exchange markets that such a high bias in forward exchange rates and opportunities for large speculative gains could persist for some months without a larger volume of forward sales of sterling and the resultant interest rate arbitrage outflows producing a much quicker drop in the sterling exchange rate.

Turning to the Deutsche Mark/Swiss franc rate (Graph 4), the strong appreciation of the franc up to the early autumn of 1978 also provides evidence of cumulative upward revisions of exchange rate expectations as a result of the exchange rate movements themselves. By early autumn 1978 the situation was threatening to get out of control and it took strong official reassurances to reverse the trend. Once market participants ceased to believe in a constantly appreciating franc, the influence of the negative interest rate differentials began to assert itself, although this influence was mitigated by the relative strength of the Swiss and the weakness of the German current-account positions. In fact, partly as a result of this favourable current-account constellation and a temporary re-emergence of a substantial stability premium, the franc began to resume its upward trend in the spring of 1980 and, notwithstanding a renewed pick-up of the domestic inflation rate, showed very considerable strength relative to the Deutsche Mark during the rest of 1981.

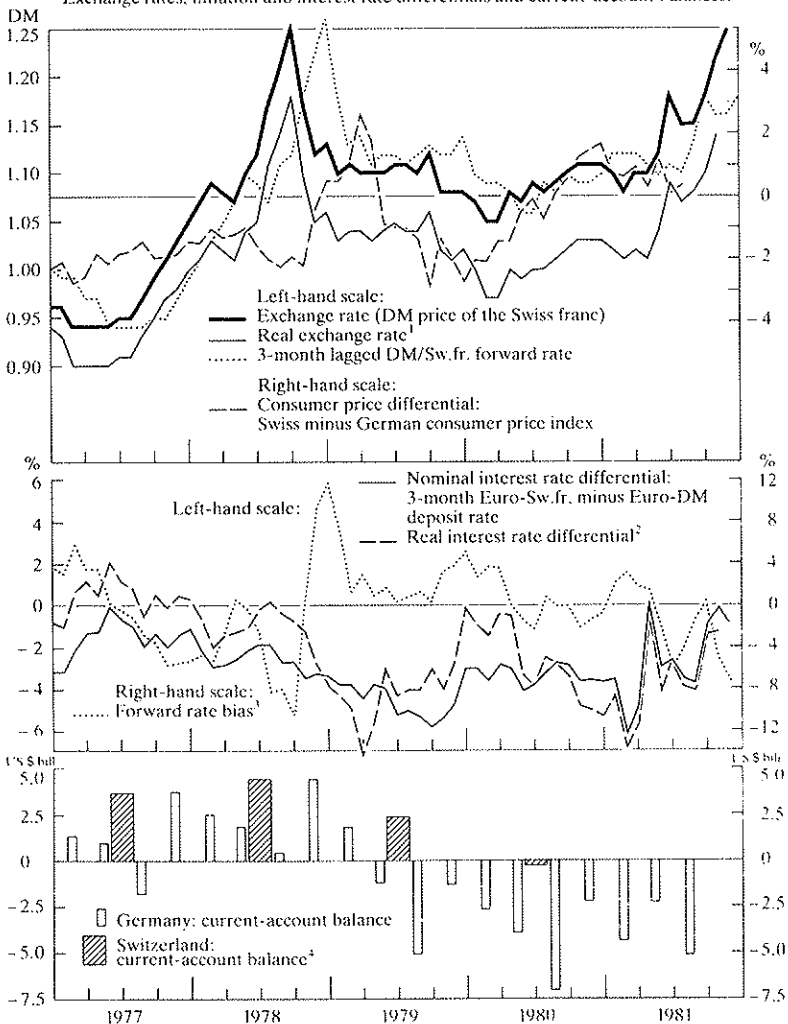
The DM/Swiss franc rate is a particularly interesting case, since from early 1978 the Swiss franc has not only shown a persistently negative nominal but, somewhat along the lines discussed in Section V, even a negative real interest rate differential. This implies that unless the Swiss franc appreciates in real terms vis-à-vis the Deutsche Mark, its forward rate structure is a consistently biased estimator of future DM exchange rates, a constellation which is undoubtedly due to Switzerland's very strong current-account position and its special rôle in international finance.

Summing up, it can probably be said that the message of these graphs is that the exchange markets did not behave very much according to the textbook. There was certainly no evidence that

Graph 4

Switzerland and Germany

Exchange rates, inflation and interest rate differentials and current-account balances.



¹ Exchange rate adjusted for relative development of Swiss and German consumer price indices.

² Interest rate differential adjusted for consumer price differential.

³ Difference between lagged forward rate and actual spot rate expressed as a percentage of spot rate.

⁴ Figures not seasonally adjusted.

market participants had fairly definite views about equilibrium exchange rates, and, to the extent that they did, their views were adjusted flexibly along with the movements in spot rates. In view of the short-run insensitivity of current-account balances to exchange rate changes, these floating views about the equilibrium exchange rate level meant that the stabilising mechanisms did not work. On the contrary, once the exchange rates had begun to move, there were apparently strong influences – J-curve effects and repercussions on domestic inflation rates – that tended to perpetuate these movements. This, in turn, apparently tended to persuade market participants that instead of placing their stakes on longer-run equilibrium levels the safest assumption was further movements in the same direction. Thus, instead of gravitation towards equilibrium zones, the dominant influence on exchange rate behaviour for most of the time appears to have been the endogenous dynamics of the exchange rate movements themselves.

In fact, on several occasions the only kinds of stabilising mechanism that did exist seem to have been official intervention in the exchange market, external borrowings or redemptions by the public sector, use of foreign exchange regulations and the gearing of domestic monetary policy to external requirements. It is difficult to say how large the fluctuations would have been in some periods without this official commitment to avoid at least the worst kind of exchange rate excesses; and it was in several instances only market participants' belief that the authorities would finally take strong enough action to prevent the exchange rate from continuing further in the same direction that was able to turn exchange rate expectations.

This dependence of the exchange markets on the stabilising rôle of the official sector did, however, mean that floating did not provide national policy-makers with the kind of autonomy from external influences promised by the textbooks. In fact, it appears that on occasion the impact of external factors on the domestic economy and policy was amplified rather than dampened via the exchange market. The absence on the part of exchange-market

participants of firm views about equilibrium exchange rates meant that the movements of nominal exchange rates were in large measure independent of inflation differentials and, therefore, that at times it was nominal rather than real interest rate differentials that had a dominant influence on exchange rate behaviour. Thus, a country with a low domestic inflation rate could be confronted with a situation in which high nominal interest rates abroad left only the choice between importing inflation by allowing the exchange rate to fall, or introducing a degree of monetary restraint which was tighter than that implied by these high nominal interest rates in their country of origin. In other words, the cutting loose of nominal exchange rate movements from inflation differentials meant on occasion that monetary restraint bit less where it should have bitten, but hit especially the countries with lower domestic inflation rates.

While, short of a general return to a much greater degree of national monetary stability, the only hope of reducing the volatility of expectations and achieving a more meaningful performance of the floating rate mechanism would appear to be a firmer official stand against excessive exchange rate instability, this is not to claim that official exchange rate policy in the past has always been optimal. It could perhaps be argued that, instead of permitting quick adjustment and building up a wall of defence only when the adjustment was threatening to go too far, the authorities sometimes resisted the exchange rate movements at too early a stage when they could still be regarded as justified. This might not only have spread out the adjustment over time, thereby permitting the gradual build-up of expectations of further movements in the same direction, but may have tended to deprive the authorities of the ammunition they would have needed later on when the exchange rate movements were getting out of touch with reality. However, even this criticism is a highly tentative one, since it cannot be taken for granted that the centrifugal forces built up by a quick adjustment would have been weaker and easier to contain than those arising out of protracted one-directional exchange rate movements.

Conclusions

As its name suggests, a floating rate system is one in which the balance-of-payments adjustment mechanism depends heavily on changes in nominal exchange rates. Even under fairly stable and ideal economic conditions, the efficient functioning of such a system would imply substantial exchange rate movements, though undoubtedly on a much smaller scale than has been observed in recent years. The logic of the system might at times even imply a temporary (and limited) depreciation of the less inflation-prone currency, which, however, should certainly not be regarded as a sign of underlying weakness but simply as a temporary technical adjustment entailing correspondingly greater exchange-market strength later on.

Despite the reliance on exchange rate movements as an adjustment mechanism, even a smoothly functioning floating rate system would not permit the authorities to conduct their domestic economic policies in total disregard of external considerations. While a floating rate system could cope efficiently with moderate and fairly temporary international interest rate differentials, excessively large and more persistent real interest differentials would, especially under ideal conditions of near-perfect foresight, require exchange rate movements of an order of magnitude that might be considered unacceptable because of their allocative and real income effects and because of their impact on the domestic rate of price increases.

At the same time, it should be stressed that, contrary to widely held beliefs, a high degree of international integration of financial markets does not in itself present an obstacle to the smooth functioning of a floating rate system. On the contrary, under ideal conditions of realistic and therefore stable exchange rate expectations, a high degree of capital mobility would ensure that the magnitude of exchange rate movements necessary to cope with temporary balance-of-payments disequilibria is kept to a minimum. And in fact, in a world such as the present one, in which it may take

as much as five to six years before exchange rate changes produce their full effect on current-account balances and where J-curve effects tend to prevail in the short run, there is hardly anything else but short-term capital flows that can provide a stabilising mechanism in the absence of official intervention or other exchange rate policies.

It is of course true that a high degree of international capital mobility may reduce the leverage of official exchange-market intervention, as the amount of official currency sales (purchases) necessary to attain certain exchange rate goals might become virtually infinite. However, as correctly stressed by advocates of the floating rate, in an efficiently functioning floating rate system official intervention in the exchange market would in any case make little sense (except in the case of political and social disturbances). The only kind of "intervention" policy, short of outright controls on capital movements, that would seem to be needed on occasion, would be to prevent the domestic interest rate level from becoming too far out of line with the rest of the world to start with. Autonomous changes in current-account balances would be smoothly accommodated by exchange rate movements without requiring even a temporary adjustment in the country's interest rate level.

Unfortunately, a floating rate system loses quite a few of its charms, and a number of the above conclusions have to be modified, when it is transposed from the somewhat idyllic conditions usually assumed by theorists to a world economic setting characterised, as is the present one, by a large measure of economic and political instability and uncertainty. A high degree of international capital mobility under these circumstances will still be a necessary condition for the efficient functioning of the system, but no longer a sufficient one, and on occasion this high degree of international capital mobility might aggravate exchange rate instability. Official intervention in the exchange markets, backed by other policy tools geared to external balance, will at times be the only way to avoid excessive exchange rate movements, although this might sometimes

entail serious conflicts with domestic policy goals. Fortunately, however, in such a muddled scenario official intervention will not only be more meaningful than in a world of stability and certainty, but, in addition, its leverage will tend to be larger, since the pronounced uncertainties will reduce the elasticity of supply of speculative and interest arbitrage funds. Moreover, in a world of pronounced uncertainties there would seem to be more scope than under ideal conditions of near-perfect foresight for a certain degree of national autonomy in the field of long-term interest rates.

The reason why the actual performance of the floating rate system has fallen so far short of the promises of pure theory is that the factors that led to the ultimate collapse of the fixed rate system in early 1973 – large differences in national rates of inflation, pronounced uncertainties about inflation and governments' ability to cope with it, as well as socio-economic developments in general – were not congenial to the smooth functioning of a floating rate system either. Moreover, since the end of 1973 a new destabilising set of influences has emerged, viz. the various consequences of the oil price explosions. The impact of these oil price increases on the magnitude of international balance-of-payments disequilibria, inflation and more general economic uncertainty would undoubtedly have severely tested the viability of any fixed exchange rate system too.

The crucial conditions for the smooth functioning of a pure floating exchange rate system are (i) a determinate longer-term equilibrium level (or path) of the exchange rate, and (ii) the ability of exchange-market participants and operators to evaluate this equilibrium exchange rate level realistically. Any unnecessarily large deviation of the exchange rate from its equilibrium level (or path) would in such a scenario elicit stabilising speculative position-taking and would therefore be quickly reversed or even forestalled.

Unfortunately, it is doubtful whether under present economic circumstances it is even meaningful to speak of a determinate (nominal) equilibrium level of the exchange rate and whether, even if it did exist, exchange-market participants would be able to identify

it with any degree of confidence and to count on its ultimate realisation. With J-curve effects, and with domestic monetary authorities not in full control of inflation, exchange rate movements will not only tend themselves to affect the longer-term equilibrium level of the exchange rate, but will tend to produce market forces and a psychological climate that will favour further exchange rate movements in the same direction. There may thus be a danger of exchange rate changes becoming cumulative, of overshooting, and – as in other fields where the equilibrating reactions take a long time to work themselves through – of cyclical types of exchange rate movements with wide amplitudes of fluctuation. Experience since 1973 seems to provide ample illustration of this kind of danger.

In such an environment, where exchange rate movements may become partly self-justifying, or can be a source of new disequilibria rather than being part of an equilibrating mechanism, a satisfactory degree of exchange rate stability may, as already stressed, at times be attained only with the aid of substantial official intervention in the exchange markets, and some gearing of domestic policies to external requirements. It is true, of course, that the authorities may not themselves have superior judgement and foresight and that there is a danger that these interventions and accommodating policies may come under the influence of pressure groups and political considerations. However, unlike market operators and market-makers who will usually have to work with relatively narrow time horizons, the authorities should be able to base their interventions and policies on the kind of long-term analysis that will be necessary in view of the length of the adjustment process and the response lags involved. Moreover, the authorities should have a better view than most market participants of one of the most important sets of influences governing future exchange rate developments, viz. their own economic strategies and policy intentions. In fact, when the (nominal) longer-term equilibrium level or path of the exchange rate becomes indeterminate in the sense that it will itself be strongly influenced by exchange rate movements and their consequences for the country's price performance, it can be meaningful only as a

policy target rather than a unique constant that could be objectively calculated and identified if all the necessary information was available. And once the authorities have chosen a realistic target range, they should usually be in a position through appropriate conduct of domestic economic policy to make this target a sustainable one. Moreover, by showing that the authorities are concerned about what is happening in the exchange market, official intervention, even if carried out on a relatively modest scale, may have a calming influence on exchange rate expectations. Finally, unlike certain market-makers, whose trading margins and turnover tend to be positively related to the size of exchange rate fluctuations, the official sector does not have a vested interest in exchange rate instability. All this, however, does not imply that the authorities should try to suppress all exchange rate movements; but what they should try to do is to prevent the real excesses.

From the point of view of pure economic theory, official intervention is of course not very attractive. It cannot be nicely fitted into models; and it means the substitution of discretion and judgement for simple and automatic formulae that appear to provide neat and simple answers to any problem. However, the case for official intervention and other exchange rate policies is purely a reflection of the imperfections and "messiness" of the real world. The achievement in the main industrial countries of a more stable and predictable economic and monetary environment would certainly be a most important step towards reducing external constraints and the need for official intervention. In the present world of the "second-best", however, "first-best" policies such as "pure" floating may only yield "third-best" results.

