

Occasional Papers No. 5

**THE IMPACT OF EXCHANGE RATE CHANGES
BETWEEN KEY CURRENCIES ON THE DEBT
STRUCTURE AND DEBT SERVICE BURDEN
OF DEVELOPING COUNTRIES.**

Helmut W. Mayer



The South East Asian Central Banks (SEACEN)
Research and Training Centre
Kuala Lumpur, Malaysia
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FOREWORD

The SEACEN Centre, in collaboration with Bank Indonesia as the host central bank, conducted the Seminar on the Impact of Exchange Rate Changes in Key Currencies on the Balance of Payments on 22-24 October 1987 at Denpasar, Bali, Indonesia. The Seminar was attended by senior officials of central banks and monetary authorities of the South East Asian Central Banks (SEACEN) group. This forum provided the participants an opportunity to exchange views and experiences on the impact of the changes in the exchange rates of the major currencies of the world on trade, capital movements and external debt as well as on the policy responses taken by their authorities in addressing the effects of these changes.

As with other seminars organized by the Centre, the resource persons invited in this Seminar shared their expertise and experiences on the topic, and led the discussion of the various issues on hand. Dr. Helmut W. Mayer, Assistant Manager and Head of the International Division of the Monetary and Economic Department, Bank for International Settlements (BIS), was one of the resource persons for this particular Seminar. He led the discussion on two major issues; one dealt on the impact of exchange rate changes in key currencies on the external debt of developing countries, which is the main focus of the article in this Occasional Papers No. 5. Among others, Dr. Mayer presented in this paper a systematic way of analysing the impact of a strongly depreciating U.S. dollar vis-a-vis other major currencies on the external debt structure and debt service burden of developing countries. Dr. Mayer, who has been with the BIS since 1963, has two doctorate degrees, one in business economics from the University of Commerce in Vienna, and the other in economics from Stanford University. He has numerous publications on various topics under his name, especially in the fields of international banking and exchange markets.

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December 1987

THE IMPACT OF EXCHANGE RATE CHANGES BETWEEN KEY CURRENCIES ON THE DEBT STRUCTURE AND DEBT SERVICE BURDEN OF DEVELOPING COUNTRIES

Helmut W. Mayer

The past ten to twelve years have been a period of pronounced and nearly continuous exchange rate instability between the currencies of the major industrial countries. Expressed as an index, and after adjustment for inflation differentials, the Japanese yen appreciated between late 1976 and 1979 from 100 to 140 per cent against the U.S.dollar, subsequently eased back to 85 per cent in early 1985, but has since risen to over 160 per cent. Dollar movements were even more pronounced in terms of the Deutsche mark and sterling, with the amplitude of fluctuations reaching nearly 100 per cent (in an upward sense) in recent years (see Charts 1, 2 and 3).

It is obvious that changes in real exchange rate relationships of that order of magnitude cannot fail to have strong repercussions on the economic situation of the industrial countries directly concerned. But what are the economic consequences of this very high degree of medium-term exchange rate instability for the developing countries? How can the impact of the sharp depreciation of the U.S. dollar vis-a-vis other major currencies over the past two and a half years on the international payments position of these countries be evaluated? How, and to what extent, can the developing countries protect themselves against the negative consequences, if any, of a high degree of exchange rate instability between the currencies of the main industrial countries? These are the questions on which this paper tries to shed some light. While it cannot claim to be exhaustive or to have the ultimate answers, it does seek to provide some food for thought and fuel for further discussion.

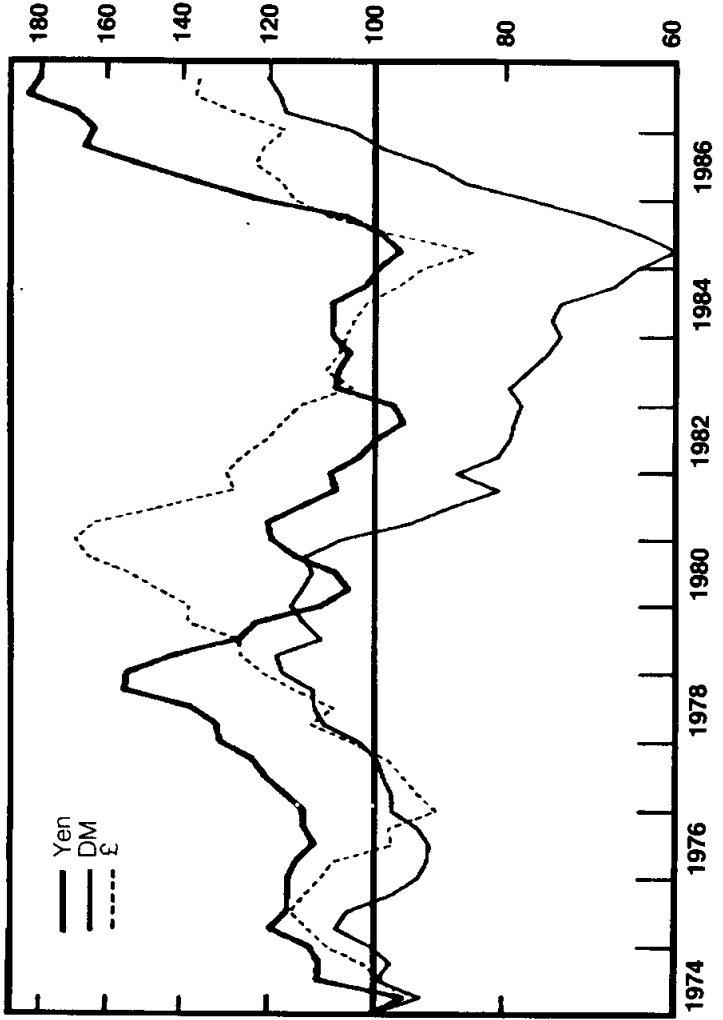
I

In order to avoid straying into generalities, let us begin by singling out a situation which may be regarded as typical for many developing countries: namely, a very substantial volume of net external debt, the bulk of it denominated in U.S.dollars and the rest of it mainly in other major currencies such as the yen, the Deutsche mark and sterling. How will the external debt structure and debt service burden of such a country be affected when, as during the past two and a half years, the U.S. dollar depreciates strongly against the other major currencies?

Unfortunately, the answer is not that simple or even clear-cut. There are basically two effects of opposite sign. Firstly, a positive one, namely, as a result of its depreciation, the international purchasing power of the dollar, *i.e.*, the currency in which the bulk of the country's debt is

Chart 1

REAL BILATERAL EXCHANGE RATES FOR SELECTED CURRENCIES AGAINST THE US DOLLAR, 1974 - 87*
(Quarterly averages, 4th quarter 1973 = 100)



* In terms of unit labour costs

Chart 2

**BILATERAL EXCHANGE RATES FOR SELECTED CURRENCIES
AGAINST THE US DOLLAR, 1985 - 87**
(Weekly averages, end-1984 = 100)

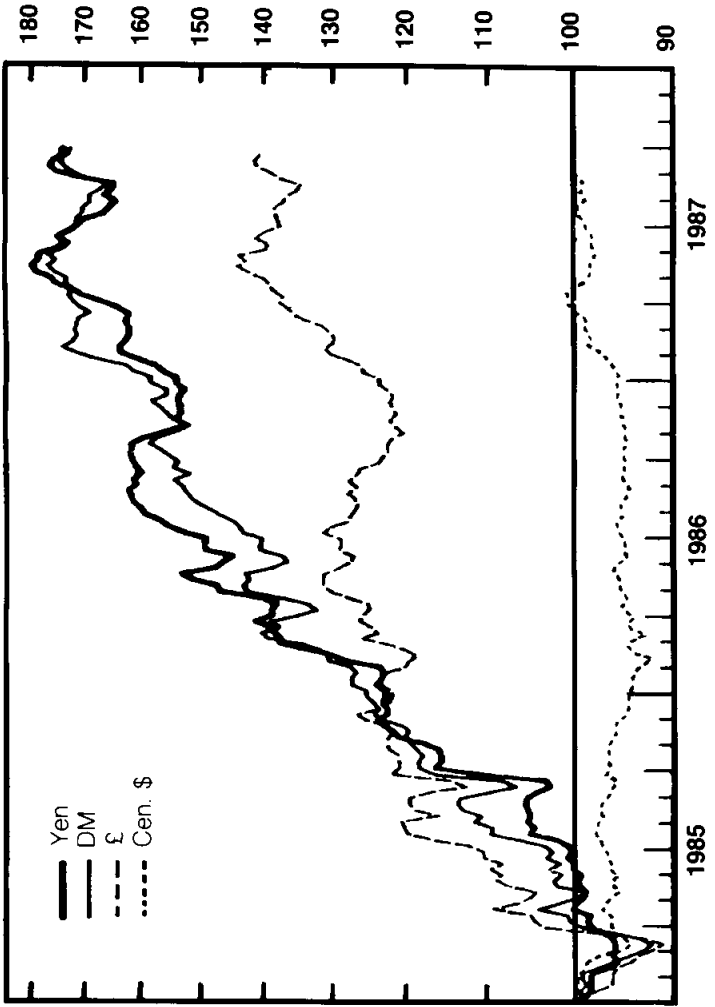
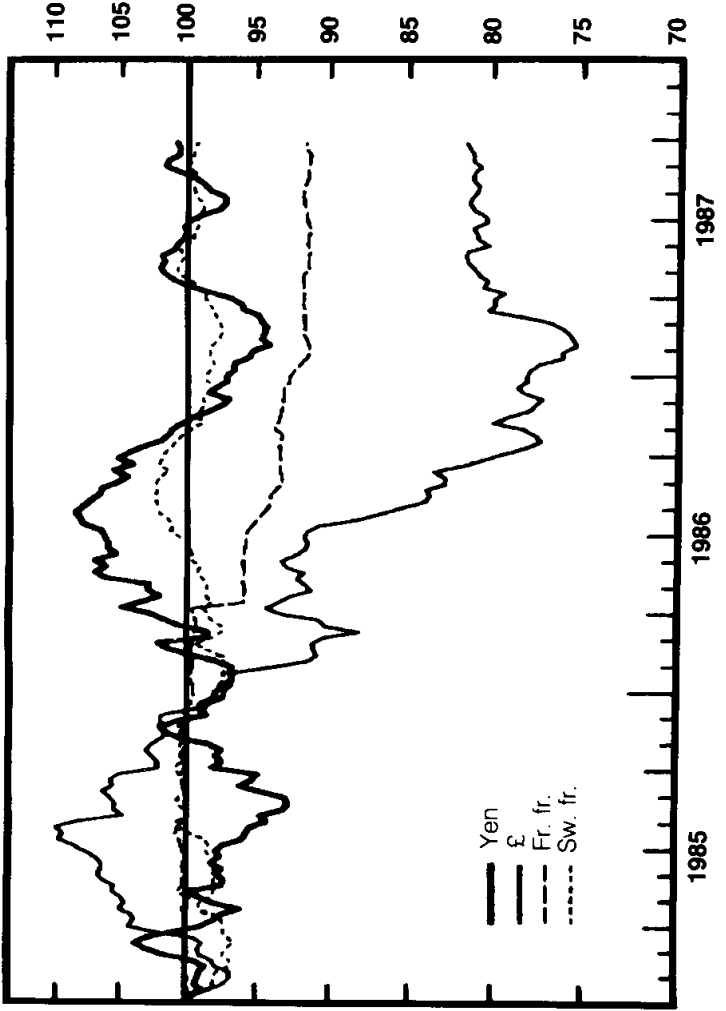


Chart 3

**BILATERAL EXCHANGE RATES FOR SELECTED CURRENCIES
AGAINST THE DEUTSCHE MARK, 1985 - 87**
(Weekly averages, end-1984 = 100)



denominated, will decrease. This means that in order to service and repay the dollar debt, a smaller amount of goods will have to be sold abroad. The decline in the real value of the dollar and of countries' external debt is reflected in the fact that in terms of the appreciating currencies, such as the yen, the country's debt and debt service burden will decline. Secondly, the negative effect of dollar depreciation is that the dollar equivalent of that portion of the country's debt which is denominated in other currencies will increase as a result of their appreciation vis-a-vis the U.S. dollar. In short, the dollar depreciation will boost the dollar size of the country's external debt, but the real value of the dollar itself will decline. Which of these two effects – the greater dollar figures but the smaller weight of the dollar – will be the more important one for the country's external payments and debt situation? The answer to this question will depend on a number of factors:

- 1) the share of the country's non-dollar debt. If, contrary to our assumptions, the whole of the country's debt were denominated in dollars there would only be the positive effect of the decreased value of the dollar, whereas the negative effect of the increase in the dollar equivalent of the non-dollar debt would be absent and there would, even in nominal terms, be no increase in the country's external debt and debt service obligations. In real terms, *i.e.*, measured in terms of the dollar's international purchasing power, they would even decline, although normally by less than the dollar depreciation. Conversely, on the other extreme and highly unlikely assumption that the country's external debt were all in non-dollar currencies whose international purchasing power would increase as a result of their appreciation vis-a-vis the dollar, the debt service payments in terms of dollars would go up by the same percentage as the depreciation of the dollar vis-a-vis these currencies and there would also be a lesser increase in the real value of the country's debt and debt service burden. Virtually, all cases will lie between these two extremes. This means that there will be both positive and negative effects, so that the real net impact of the dollar depreciation on debt and debt service burden cannot be identified in *a priori* terms. Given the currency distribution of the country's external debt, it will, in fact, depend on a second set of factors:
- 2) the reaction of the country's export/import prices and volumes, which will determine the impact of the dollar depreciation on the country's current-account balance. It is these highly complex price and volume effects of dollar depreciation on the country's terms of trade and external trade performance, and thereby on the real weight of its external debt and debt service burdens, which will occupy us for much of the rest of this paper.

II

If we assume that the country's own currency is pegged to the dollar, that all its exports and imports are denominated in dollars, that dollar export and import prices and volumes do not change, and that the country's whole debt is in dollars, the dollar depreciation would obviously have no real impact on the country. Except for the peg to the dollar, this is, however, an extremely unrealistic set of assumptions to make, and in order to gain a better understanding of the situation, we will not dismiss these assumptions one by one.

Before we can do this, however, we have to make some further assumptions about the structural composition of the country's current account. We will basically discuss two scenarios: one in which the country is mainly an exporter of raw materials and an importer of industrial products and services; the other one in which the country is in a fairly advanced stage of economic development, being a net exporter of industrial products and a net importer of raw materials.

To begin with the first scenario, namely, the raw material exporting country, let us, moreover, assume to start with, that excluding interest payments on its external net debt, the country's current-account balance is in equilibrium, so that the proceeds from the raw material exports fully finance the imports of the industrial goods. This, of course, also implies that the country is a net capital importer to the extent of its interest payments and that there are therefore no "net resource transfers".

After spelling out these assumptions, let us now go into the question of how dollar depreciation will affect the country's export and import prices and volumes. Let us begin with the export side, namely, the raw materials.

A dollar depreciation will, other things remaining equal, have an upward impact on the demand for and prices of raw materials in dollar terms. The explanation of this phenomenon is simple. If the dollar price of the raw materials were to remain unchanged this would mean that in the countries whose currency had appreciated against the dollar, the domestic currency price of these raw materials would decline. This decrease in the real price of the raw materials would tend to push up the demand for them and thereby, other things remaining equal, also their dollar price. The magnitude of the upward price and demand effects in turn, would depend on a large number of factors: the elasticity of demand for these raw materials in the consumer countries, the appreciating countries' share of the total demand for these raw materials and, last but not least, the supply situation.

It is not easy to make generalisations about the size of these parameters and we will therefore limit ourselves to only a few remarks. At least in the short- to medium-term, the demand for raw materials may tend to be fairly price-inelastic or rather closely related to the level of

economic activity in the consumer countries, although the situation may be temporarily influenced by changes in inventory policies or by commodity speculation. Excluding these temporary influences, the upward impact of dollar depreciation on the demand for and the dollar price of raw materials, therefore, may be quite modest. Moreover, a rise in the dollar price of raw materials would tend to reduce the demand for these raw materials in the United States and in other dollar-based countries. Finally, the size of the dollar price increase will depend also on the supply situation. When there is a surplus in supplies of this raw material, with buffer stocks or production rationing entailing essentially a horizontal supply curve, there may be no price effect, but the exporters would benefit from the larger volume effects.

In short, while on a *priori* grounds, one might expect dollar depreciation to lead to an increase both in the price of raw materials and in the volume of raw material sales (we are still assuming that the raw material exporting countries are pegged to the dollar), the quantitative significance of these effects is by no means certain and will be different in each case. It may be added that up to mid-1986, we had the most unusual situation of a depreciation of the dollar being accompanied by a decline in the dollar prices of raw materials. However, this was due to the special situation in the oil market, relatively slow economic growth in the industrial countries and certain structural factors. In other words, without dollar depreciation, this decline in raw materials prices would have been even more pronounced.

Let us now turn to our country's net imports of industrial products. To the extent that these imports come from countries whose currencies are appreciating against the U. S. dollar, their prices will go up in dollar terms, although probably by less than the amount of the appreciation, because in order to stay competitive, the exporters in these appreciating countries will tend to be willing to make some price concessions. But even dollar prices of imports from the United States or other countries whose exchange rates are tied to the dollar may increase somewhat, since, because of the improvement in their competitive position and stronger demand for their products, exporters in these countries may be tempted to put up the prices of their exports. Nevertheless, prices of imports from the dollar countries are, in general, bound to increase less than those from the appreciating countries, and the developing country may be able to keep down, to some extent, the increase in the average price of its import by shifting its purchases from the appreciating countries to the dollar countries.

On the whole, in light of these considerations, it would seem likely (although by no means certain) that the dollar depreciation would have a stronger upward impact on the average dollar price of the developing country's imports of industrial goods than on the price of its raw material exports. This would mean that its terms of trade and real income would deteriorate. Moreover, in the absence of volume effects, this deterioration

of the country's terms of trade would also entail a deterioration of its trade balance.

Fortunately, these positive volume effects are unlikely to be zero or near zero. We have already mentioned that the dollar depreciation will tend to have some positive volume effects on our developing country's exports of raw materials. Such volume effects may also be significant as regards its net imports of industrial products. The reason is that, in view of the country's fixed exchange rate vis-a-vis the dollar, its own industries will gain in competitiveness vis-a-vis the appreciating⁴ countries. The higher prices of imports from the appreciating countries may lead to some import substitution in our developing country and some reduction in the demand for these imports in general. Moreover, the improvement in its competitive position may also facilitate the building-up of some export industries.

In short, the volume effects of dollar depreciation are bound to be quite positive for the trade of our developing country. Whether there will be an overall improvement in its current-account balance (excluding interest payments) will depend on the extent of these positive volume effects relative to the possible deterioration of the country's terms of trade. If this terms-of-trade deterioration is quite small, or there is no such deterioration, the developing country might show quite a considerable improvement in its trade balance as a result of depreciation of the dollar vis-a-vis other major currencies.

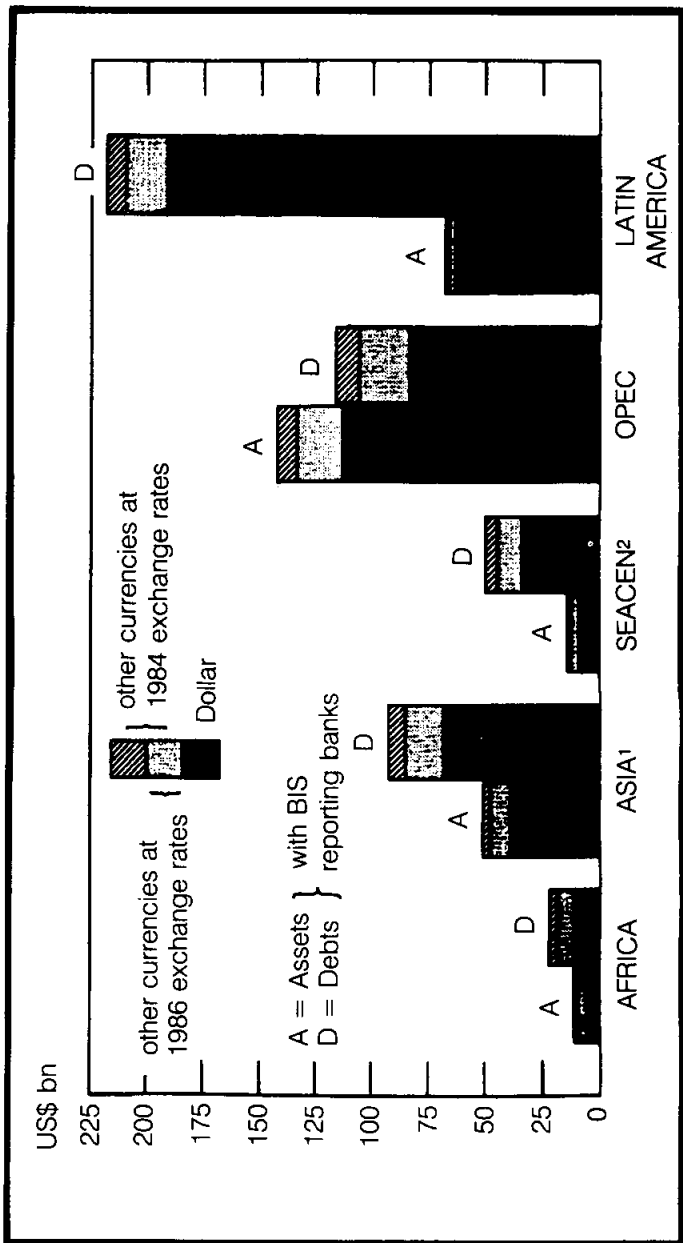
It should be noted in this connection that the relative importance of the volume effects versus the price effects is partly a function of the time span under consideration. Whereas the negative price effects tend to occur quite rapidly, the volume effects depend on a re-allocation of resources and investments that may take years to materialise fully; and in part, it also depends on shifts in consumption patterns and trends that are also very slow to come about. For these reasons it is quite conceivable that at first, the negative terms-of-trade effects, if any, of dollar depreciation will prevail, but that, as time goes on, the volume effects will become more and more important until the country's trade balance begins to improve belatedly – the so-called J-curve effect – in response to the depreciation of the dollar vis-a-vis the other key currencies.

Whether the country's overall current-account balance and therefore its international payments position will improve as a result of the dollar depreciation depends, however, on yet another factor. As already mentioned, insofar as some of the country's net external debt is denominated in appreciating currencies and not all in dollars, the dollar value of the interest service on this non-dollar debt will go up automatically in line with the appreciation (see Charts 4 and 5). To achieve an overall improvement in its current-account balance and a reduction in international borrowing requirements, the improvement in our country's trade

Chart 4

CURRENCY COMPOSITION OF THE EXTERNAL BANKING DEBT OF DEVELOPING COUNTRIES

(As at end-December 1986, in billions of US dollars)



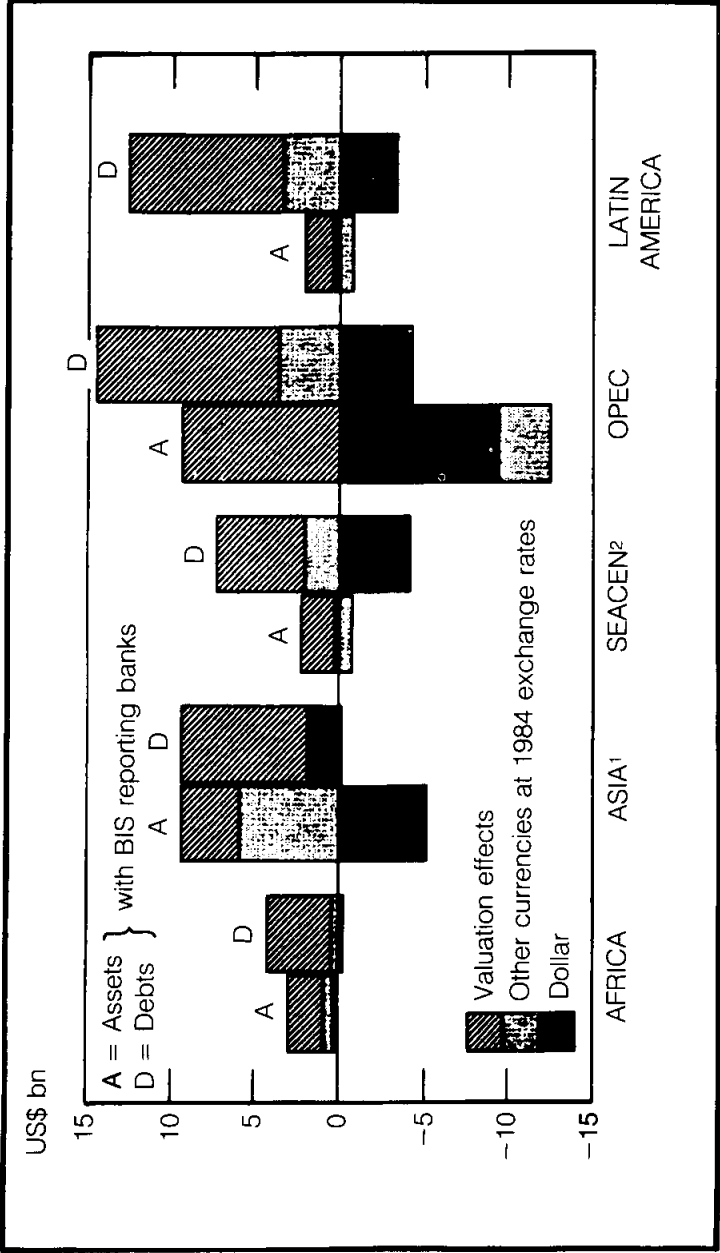
1 excluding Taiwan

2 excluding Singapore

Chart 5

CHANGE IN EXTERNAL BANKING DEBT OF DEVELOPING COUNTRIES

(From end 1984 to end 1986, in billions of US dollars)



1 excluding Taiwan

2 excluding Singapore

balance will have to be large enough to offset this increase in debt service.

So far we have assumed that, apart from interest payments, the developing country's current account is in balance. Let us now drop this assumption and suppose that the country has a surplus large enough to enable it to meet its interest payments without capital imports or even to amortise some of its debts. Closer inspection will show that this change in scenario will leave the results of our above analysis basically unchanged, except that, at least in the short-run, the chances of a positive balance-of-payments impact of the dollar depreciation may be somewhat better. The explanation is that the country's export surplus in raw materials will now be much larger than its net imports of industrial products. But in the field of raw material exports, both the volume and price effects of dollar depreciation will tend to be positive, even if not very large. As regards net imports of industrial products, on the other hand, the volume and price effects will, as already explained, work in opposite directions, so that at least in the short-term the net balance-of-payments impact of dollar depreciation might be negative.

Greater modifications will have to be made to our conclusions when we now turn to our second scenario of a country which has a net export surplus in the field of industrial products while being a net importer of raw materials. As regards its gross exports of industrial goods, both the volume and price effects will be favourable (we still assume that our country's currency is pegged to the dollar). Because of the improvement in its competitive position vis-a-vis the appreciating countries, our developing country will be able to expand its exports and might also charge rather higher dollar prices. As regards its imports of industrial products, the volume and price effects will, as already explained, tend to move in opposite directions, whereby the magnitude of the negative price effects will depend, to a considerable extent, on whether these imports come mainly from the appreciating countries. The positive import substitution effects will tend to be larger than in the previous scenario since the country according to our assumption, will have a relatively dynamic and diversified industrial sector. In short, as regards the impact on the country's trade surplus of industrial goods, there will be three positive effects from the dollar depreciation - the expansionary volume effects on exports, the contractive volume impact on imports, and the probably moderate upward price impact on exports; and one negative effect - the rise in import prices. The likelihood is that, particularly in the longer-run and where imports of industrial goods are relatively small in relation to their exports, the three positive effects will outweigh the negative one and that the country's trade balance in industrial products will show a considerable improvement. South Korea and Taiwan are good examples of this kind of phenomenon.

As regards the net imports of raw materials, there may be, for

reasons already explained, some upward impact on prices, but in that case there will also tend to be some positive volume effects as these higher prices might give rise to some import substitution and economies-in consumption. On the whole, the trade deficit in the field of raw materials may go up somewhat, particularly in the short-run, but this deterioration is unlikely to be dramatic and will probably not be large enough to affect the improvement in our country's trade balance in the field of industrial products.

Summing up our analysis thus far, it can undoubtedly be said that it is very difficult to generalise about the impact of dollar depreciation on developing countries' international payments and debt situations, since very much will depend on the currency composition of the debt and the particular circumstances of the individual countries. To the extent that some proportion of the country's external debt is denominated in currencies other than the dollar, the dollar value of the external debt and of the debt service payments will go up, but at the same time, the real value of the dollar will have declined. This is reflected in the fact that the increase in the debt service obligations will quite often be offset, or more than offset, by a positive impact of the dollar appreciation on the country's current-account balance (minus interest payments). This positive trade effect is, however, by no means certain. It is likely to be important mainly:

- 1) in countries which are large net exporters of goods and services;
- 2) in countries which are net exporters of industrial products and net importers of raw material, i.e., the NICs; and,
- 3) in countries whose imports come mainly from the United States or other countries with currencies tied to the U.S. dollar and whose exports go mainly to the appreciating countries.

Conversely, in countries (a) where exports and imports and goods and services (excluding interest payments) are of roughly equal size, or which have even a trade deficit, (b) where there is a net import of industrial products and (c) where these imports come largely from the appreciating countries, the improvement in the current balance (excluding interest payments) may be smaller than the increase in interest payments in dollar terms, or there may actually be no such improvement. In that case, these countries would suffer considerable damage as a result of dollar depreciation.

III

The analysis, so far, takes into account only the direct demand, supply and price implications of exchange rate changes. Dollar depreciation, particularly if it threatens to get out of hand, might, however, also have broader implications for world economic growth, interest levels and inflation rates, which might affect the results of the above analysis. Perhaps the most obvious influence would be the impact of dollar depreciation on U. S. interest rates. If the decline of the dollar becomes so

excessive as to pose serious inflationary dangers for the United States, or to produce an unrealistic exchange rate structure that would ultimately have to be corrected, the United States might be persuaded to tighten monetary conditions and push up interest rates in order to extend support to the dollar. Moreover, such an impact on interest rates, particularly in the longer-term field will tend to come about automatically if investors, for reasons based on exchange rates and related inflation fears, lose their confidence in the dollar and withhold their funds until a further depreciation of the dollar. Because a very large proportion of developing countries' international debt – particularly insofar as it is owed to commercial banks – is at floating interest rates, this rise in dollar interest rates will be fairly quickly translated into an increase in debtor countries' interest obligations. Especially in countries where the external debt is very high in relation to exports and where nearly all this debt is denominated in dollars, this increase in debt service burdens could easily outweigh the trade benefits, if any, which the country might derive from the depreciation of the dollar.

A second influence could be exerted via the impact of dollar depreciation on the level of world economic activity. In the appreciating countries, resultant loss of competitiveness would tend to have a negative impact on investment activity; moreover, economic activity in these countries would tend to be impaired by the eventual reduction of their current account surpluses (in terms of domestic currency). In the United States, by contrast, the expansionary effects of the decline in exchange rates and the resultant gain in competitiveness might be offset by higher interest rates. In that case, the depreciation of the dollar would be likely to result in lower growth in the industrial countries. This, in turn, would tend to lead to a weakening in the demand for raw materials and of their prices and also a reduction in the demand for developing countries' industrial exports. As a result, the likelihood that the developing countries' external payments situation might benefit from dollar depreciation would be reduced further.

Of course, to the extent that the dollar was overvalued to start with, a correction was unavoidable and undoubtedly in the long-term interest of a more balanced and stable development of the world economy. What, however, would be clearly undesirable is an exaggerated decline of the dollar well below its longer-term equilibrium value. We will come back to this problem of exchange rate instability in the next section.

IV

What has been said above about the impact of dollar depreciation on developing countries' current account balance also applies, with signs reversed, to the impact of dollar appreciation. It may benefit some developing countries and hurt others, and in countries pegged to the

dollar, the short-run effects may tend to be more positive than the longer-run ones. However, the main point to be made here is that exchange rate instability, particularly of the medium-term kind, will be a nuisance in itself. Even when in the very long-term the exchange rates between the main industrial countries do not change very much, large medium-term fluctuations of exchange rates around their equilibrium path is bound to do a lot of damage. They will provide wrong signals for resource allocation, will create temporary trade dislocations, will encourage protectionist measures and, by creating additional uncertainties, will make investment decisions more risky and difficult. For these reasons, medium-term exchange rate instability will tend to have a dampening effect on international trade and economic growth in general, which is of course a particularly serious concern for the developing countries. Moreover, as already explained, exchange rate movements will have almost instantaneous effects on the dollar value of countries' debt service obligations.

What can developing countries do to protect themselves against these negative consequences of exchange rate instability between the currencies of the main industrial countries?

One strategy which immediately springs to mind would entail the developing countries pegging their currencies not solely to the U.S. dollar but to a basket of major currencies, whereby the weight of the individual currencies might be governed by the share of the respective currencies in the country's exports. This policy would especially make sense in countries where a large proportion of exports does not go to the United States or to countries pegged to the dollar. It would tend to preclude, or at least reduce, the terms-of-trade and real income effects resulting from very large movements in dollar exchange rates.

On the other hand, although preferable to a fixed dollar peg, a basket-orientation of exchange rate policy would not act as a fully effective shield against dislocations and misleading allocation signals produced by distortions in the real exchange rate relationships between the dollar and the currencies of other industrial countries. Moreover, it could not provide any protection against changes in debt service burdens resulting from the exchange rate movements between the dollar and other major currencies. This latter consideration would seem to suggest an additional step that might be taken, namely an alignment of the currency composition of the external debt with the currency orientation of exports, since it is out of export proceeds that the external debts would ultimately have to be serviced. However, on closer inspection it is not clear whether this criterion is really a meaningful one. For one thing, it is by no means obvious whether gross or net export shares would be relevant for this purpose. If, for example, a country is a large gross exporter to a given currency area but an even larger importer from this area, it is not clear, particularly in the short-term, whether appreciation of this currency would result in an improvement in our country's balance of pay-

ments vis-a-vis that area. Secondly, for countries that are mainly exporters of raw materials whose prices are internationally determined, changes in exchange rates between industrial countries may not have very much impact on export proceeds, so that this policy would not be able to provide much hedge against fluctuations in debt service obligations.

Since the two types of strategies discussed so far provide only partial protection against exchange rate fluctuations between industrial countries, one might consider an additional strategy: active exchange risk management, which entails changing the currency composition of external debts in response to exchange rate developments. Since the currency composition of developing countries' external gross debt, even in countries with good credit standing, cannot easily be altered to any large extent in the short-run, this essentially means shifts in the currency composition of the country's external assets, *i.e.*, basically its official reserves. For example, in late 1984 and early 1985, when dollar overvaluation was at its peak, it would have made a lot of sense for debtor countries with a substantial proportion of their debts denominated in currencies other than the dollar to cover these non-dollar liabilities by diversifying their reserve assets out of dollars into these other currencies. A similar result could be achieved through operations in the forward exchange market.

The problem with such an active risk management policy is that its success depends on the ability to outguess the markets. In general, this will only be possible in the longer-run and at times when exchange rates are clearly out of line, as was the case in late 1984 and early 1985. Short-run shifts in coverage ratios in individual currencies in response to relatively minor exchange rate movements and speculative considerations would probably be too risky a policy which could quickly entail exchange rate losses that most developing countries could not afford.

Summing up, there can be little doubt that the external payments situations, debt burdens and the more general growth outlook of developing countries will tend to be significantly affected by major exchange rate swings between the currencies of the main industrial countries. At the same time, the policies available to the developing countries to protect themselves against the economic implications of these exchange rate swings would appear to be only of limited effectiveness. This leads to the conclusion that the developing countries do have a strong interest in the greater stability of the real exchange rates between the currencies of the major industrial countries.

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