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EXCHANGE POLICIES FOR LESS DEVELOPED COUNTRIES IN A WORLD OF FLOATING RATES

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INTERNATIONAL FINANCE SECTION

DEPARTMENT OF ECONOMICS

PRINCETON UNIVERSITY

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PETER B. KENEN, *Director*
International Finance Section

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Exchange Policies for Less Developed Countries in a World of Floating Rates

1 Introduction

The adoption of a system of floating exchange rates by the world's leading industrial nations in March 1973 has posed two serious questions for many of the world's less developed countries (LDCs). The first concerns the position they should take in international monetary negotiations vis-à-vis the continuation of worldwide floating rates. The second is how their own exchange policies should adapt to the realities of the floating-rate system with which they are now faced.[1] As Helleiner has pointed out, "A more detailed consideration of the theoretical and practical merits and disadvantages of flexible exchange rates in less developed countries is by now certainly called for."

This essay is devoted to an analysis of the choice of exchange policies, either pegged or floating, by LDCs under the assumption that the world's major currencies will continue to float for the foreseeable future. While the theoretical benefits of a floating exchange rate are not necessarily limited to developed countries, the *feasibility* of such an exchange-rate policy for less developed countries depends on (a) the development of adequate domestic financial markets integrated with world markets and (b) the willingness of their governments to allow the exchange market to operate at least relatively free of the multitude of controls, special rates, and other devices so frequently utilized by less developed countries.

For one reason or another, most of these countries have rejected floating and have chosen to tie their exchange rates to one of the world's major trading currencies: the dollar, the pound, or the franc. While the decision to peg avoids certain problems, it raises a number of others. As the Joint Economic Committee's Subcommittee on Inter-

[1] The first issue has been examined by Helleiner (1974) and Cline (1975), while some aspects of the second issue have been explored by Díaz-Alejandro (1975).

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national Economics pointed out in its August 14, 1973, Report, "Among such costs are the need to adjust to exchange rate changes that result from events wholly external to developing nations and that may shortly be reversed." In testimony on June 21, 1973, Ricardo Arriazu of the International Monetary Fund pointed out numerous other difficulties, including shifts in the direction of trade induced by tying to particular currencies, effects of fluctuations in the tied rate on the domestic money supply and price level, fluctuations in the values of external assets and debts, a need to diversify holdings of reserves, and effects of the increased cost of covering short-term exchange risks.

Discussion of these problems and the designing of policies to deal with them have been hampered by the lack of an adequate theoretical and institutional framework in which to consider them, and yet the tools with which to construct it are readily available. Accordingly, this essay attempts to lay out such a framework and to evaluate policies in that context.

In the next three sections, the macroeconomic implications of the choice between different types of exchange-rate policies for the adjustment problems of less developed countries are analyzed in a framework of internal and external balance.

Section 2 develops the "small country" model of traded and nontraded goods for the case of a less developed country. The responses of the model to various shocks under pegged and floating exchange rates are studied in section 3. Section 3 broadens the framework to include worldwide multilateral floating rates and examines formulae for effective exchange rates. Section 4 then considers the effects of alternative exchange-rate policies on the economy, as measured by the variance of domestic prices of traded goods relative to prices of nontraded goods. The alternative policies include free floating, managed floating, pegging to a single currency, and pegging to the SDR.

Section 5 discusses the institutional structure of money markets and exchange markets in less developed countries. The implications of poorly developed exchange markets and money markets are then examined, especially those deriving from the depth, efficiency, and stability of the exchange market, as well as its responsiveness to internal and external disturbances.

Section 6 combines the institutional analysis of section 5 with the macroeconomic analysis of section 4 in a cost-benefit discussion of five specific exchange-rate policies. Section 7 deals with a number of alternative financial policies, such as development of forward markets, diversification of debt and reserve assets, clearing arrangements, and borrowing versus adjustment to the oil situation. Finally, section 8

uses data on variances of effective exchange rates for one hundred less developed countries to discuss the effects of alternative exchange-rate policies in the period 1970–74.

2 A Model of Internal and External Balance for Less Developed Countries

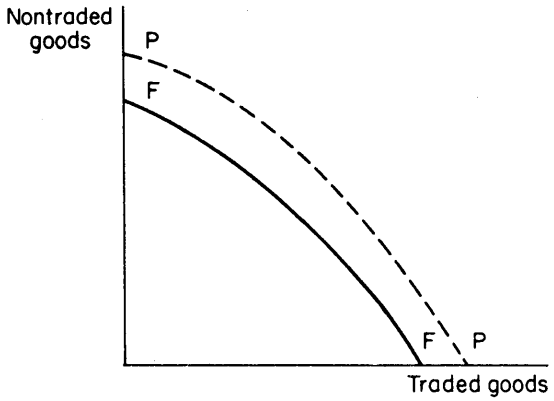
In order to analyze the effects on less developed countries of floating exchange rates among the developed countries, we need a model of the typical less developed country. Of course, there is no such thing as a "typical" less developed country because there are vast differences among them in culture, structure of production, resources, education, health, climate, etc. Nevertheless, in this essay all these long-run factors are taken as given. Furthermore, I assume that the exchange markets and financial markets have the six general characteristics (discussed in section 5) that lead to low capital mobility. For most less developed countries, it will also be appropriate to assume that the economy is open but is too small to be able to affect the world prices of its exports or imports. In addition, domestic resources may be underutilized relative to standards of efficiency applied to developed countries, but more efficient utilization may be difficult because of local culture, tradition, habits, and training, as well as distortions in markets.

It is obvious that the standard model of internal and external balance, which assumes high capital mobility, a developed financial market, and Keynesian supply conditions (Stein, 1963, or Argy and Porter, 1972) cannot realistically be applied to such economies. Therefore, the following simple model of a small, open, underemployed economy with a poor capital market has been put together from the ideas of Salter (1959), Hansen (1973), and Prachowny (1973).[2]

Since the terms of trade cannot be affected by changes in the domestic economy, exportables and importables can be collapsed into a single tradable good. Because relative prices are fixed, moreover, there is no difficulty in dealing with exports that do not compete in consumption or imports that do not compete in production. Such goods become part of the composite "tradable." There is also a nontradable good. The country's supply functions of the tradable and nontradable goods are assumed to depend on relative prices. In some cases, it may be desirable to assume that supplies also depend to some extent on real money balances, on the grounds that availability of finance may be

[2] See section A-1 of the Appendix for a formal development of this model, which has also been analyzed by Mundell (1971, Chap. 9) and Dornbusch (1974).

FIGURE 1
FEASIBLE PRODUCTION



a real constraint on production (McKinnon, 1973, Chap. 6). This production structure is described by a "feasibility locus" (*FF*) in Figure 1, indicating that resources may be underemployed. Full-production possibilities (*PP*) can be realized only by some thoroughgoing structural changes.

Domestic demand for each of the two goods is assumed to depend on relative prices, real income, and real money balances. The price of nontradables is assumed to be sufficiently flexible to equate the demand for nontradables with the supply. In the tradable-goods market, a perfectly elastic world demand guarantees that (a) the domestic-currency price of the traded good is always equal to the product of the exogenous world price and the exchange rate of the local currency and (b) net exports always adjust immediately to the excess of domestic production over consumption of the traded good.

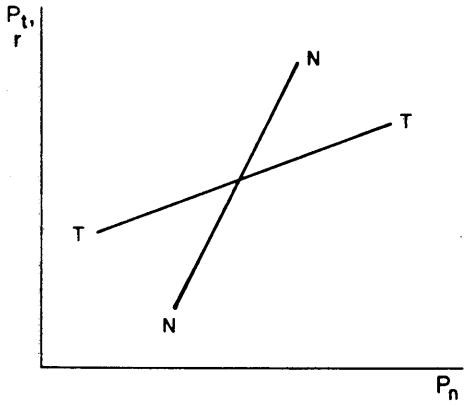
The balance of payments equates the sum of net exports and net capital inflow to the net inflow of reserves, all valued in terms of domestic currency. The foreign-currency value of net capital flow is assumed to be exogenous, unless manipulated by government policy as a tool to influence the exchange rate. Pegged exchange rates can be achieved in this model in any of three ways: (a) reserve movements, resulting from government intervention in the foreign-exchange market (the absence of such intervention will imply zero reserve movements); (b) official borrowing to finance deficits, which makes capital inflows endogenous and reserve movements zero; and (c) a system of import controls, which assures that net exports will always equal the exogenous net capital inflow but breaks the equality between the

domestic and world prices of traded goods. In the absence of such efforts to peg the exchange rate, it will adjust to equate net exports (the country's excess supply of the tradable goods) with the exogenous net capital inflows.

Finally, the money supply is assumed to depend on the government budget deficit, the accumulation or loss of foreign-exchange reserves, and the extension of credit to the domestic business sector via the banking system. In less developed countries, government budget deficits are generally financed either through money creation or spending of foreign-exchange reserves, because of the difficulty of issuing government bonds in an underdeveloped financial system. Growth in the money supply is of course crucial in affecting domestic demand for traded and nontraded goods, and hence the prices of these goods in domestic markets and the exchange rate.

The market-clearing process of the model, given the stock of money, can be seen in Figure 2 (originally developed in Mundell, 1971, Chap. 9) for the case of flexible exchange rates. In this model, internal balance requires equality of supply and demand for the nontraded good, since the infinite elasticity of foreign demand for the tradable good implies that disequilibrium in that market can easily be resolved. Thus the internal-balance curve (*NN*) is the locus of domestic prices of nontraded goods (p_n) and traded goods (p_t) that equilibrate the market for nontradables. Given the world price of traded goods ($\bar{p}_t^f$), movements in the domestic price of traded goods are of course equivalent to movements in the domestic price of foreign exchange (r). Similarly, the *TT* curve in Figure 2 is the locus of domestic prices of nontraded

FIGURE 2
EQUILIBRIUM WITH A FLEXIBLE EXCHANGE RATE



goods and traded goods that satisfies external balance, given by the balance-of-payments condition that the excess demand for traded goods must just equal the exogenous net capital inflow.

One can demonstrate easily that the slope of the *NN* curve is greater than unity, while the slope of the *TT* curve is less than unity, under the behavioral assumptions of the model. The argument goes as follows: A proportional increase in both prices (along a 45-degree line through the intersection point) would leave supply unaffected and reduce demand in both markets, because of the exogenous money supply. Equilibrium in the market for nontradables therefore requires the price of nontradables to rise *less* than proportionately, as shown by the steep *NN* curve. Likewise, equilibrium in the balance of payments requires the price of tradables to rise less than proportionately to sustain the demand for traded goods, as shown by the flat *TT* curve.

Under pegged exchange rates, achieved either by reserve movements or borrowing, the *TT* curve no longer determines the domestic price of traded goods but is replaced by a horizontal line determined by the fixed exchange rate times the exogenous world price of traded goods. The *TT* curve still determines external balance, in the sense that positions above or below the curve indicate a reserve inflow or outflow via a balance-of-payments surplus or deficit. If exchange controls are used to peg the exchange rate, a modified version of Figure 2 can still be used to determine the *domestic* prices of traded and nontraded goods based on conditions of demand and supply in the *domestic* markets for traded and nontraded goods. Foreign trade will be transacted at international prices and producers of exports will receive the world price in domestic currency, but this will be considerably less than the domestic price of exportables. Producers of importables will receive the (high) domestic price, and the resulting distortion of production away from export goods will reduce their aggregate supply compared with the results expected under floating rates.

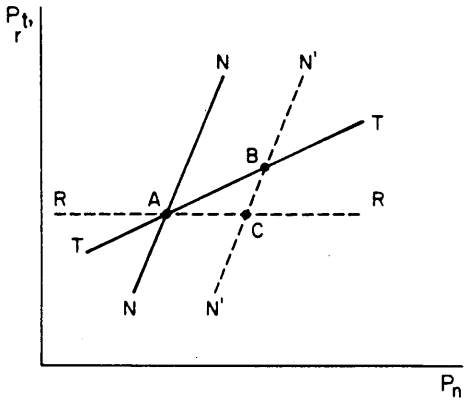
3 Internal and External Balance: Response to Shocks

Let us now consider several types of shocks to the economy and the effects of pegged versus floating exchange rates.

a. Domestic Crop Failure

As shown in Figure 3, a reduction in supply of the nontraded good caused by a domestic crop failure can be regarded as a rightward shift in the *NN* curve, leading to a depreciation of the exchange rate from *A* to *B* under flexible rates. The price of the nontraded good rises more

FIGURE 3
CROP FAILURE



than that of the foreign good, increasing the consumption of the foreign good and shifting resources toward more production of the nontraded good. If the crop failure is expected to be temporary, a more appropriate exchange policy would be to peg the exchange rate at the initial level given by the dashed horizontal line through A, by either a reserve loss or foreign borrowing. By holding down the domestic price of tradable goods, more demand could be shifted to the traded-goods sector, reducing hardship in the country. The balance-of-payments deficit is indicated by the fact that point C is below the external-balance line TT. The reserve outflow at C would reduce the money stock, shifting $N'N'$ and TT left and down, respectively. Pegging via exchange controls would *not* reduce the variance of prices and consumption in this way, since domestic prices would still be determined by TT and NN, and could even increase the variance of imports of capital goods as consumption imports fluctuate.

b. Differential Inflation Rates

If world prices rise more rapidly than domestic prices, this can be shown as a (relative) rise in the world price of tradable goods. (The opposite case would yield a fall in the world price.) Assume that the country is a capital importer with a trade deficit. The real value of the capital inflow in terms of traded goods falls and the TT curve shifts up. Under a flexible rate, the country's currency appreciates, but by less than the rise in world prices in order to earn the additional foreign exchange needed to replace the lost real capital inflow. The domestic prices of traded and nontraded goods rise. If the exchange rate were

pegged, the rise in the domestic price of traded goods would generate a surplus in the balance of payments, leading to reserve gains and monetary expansion.

c. Fall in Terms of Trade

As Salter (1959) has shown, a fall in the terms of trade changes the definition of the traded good. Therefore, it is necessary to go back to first principles.[3] Consider first a rise in import prices. The supply of foreign exchange is reduced as supply shifts from exportables to importables. The demand for foreign exchange rises or falls according to whether the demand for imports is inelastic or elastic, since the supply of imports is infinitely elastic in this model.

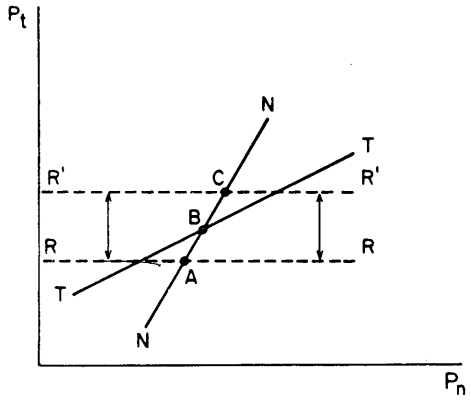
If the demand is inelastic, the exchange rate depreciates, further raising the price of imports, and that of exportables as well. The result is probably a shift of demand toward nontraded goods and of supply away from nontraded goods, thus raising their price as well, although the result depends on the strength of substitution and/or complementarity relations between the three types of goods in both production and consumption. With pegged exchange rates and an inelastic demand for imports, all prices would rise less, since the depreciation is avoided (or postponed).

If the import demand is sufficiently elastic to overcome the reduction in export supply, the exchange rate appreciates, reducing the magnitude of the increase in import prices and lowering the domestic price of exports. The price of nontraded goods rises by less than in the inelastic case, if at all. Pegged exchange rates would cause import prices to rise more and prevent export prices from falling.

Now let us consider a fall in export prices. The reduction in foreign-exchange earnings will result in a depreciation of the exchange rate, partially offsetting the reduced domestic price of exports and raising the price of imported goods. The price of nontraded goods may rise or fall, depending on the strength of the substitution toward exportables and away from imports. Pegged exchange rates would eliminate the depreciation, so that import prices could not rise. In this case, demand would shift toward exportables and supply toward nontradables, reducing the price of nontradables.

[3] See Meade (1951, Chap. VIII) and Kemp (1970) for discussion of the terms-of-trade effects of devaluation, which can be manipulated to give the exchange-rate effects of changes in the terms of trade. The elasticities used here are "total" elasticities, including the effects of induced changes in the price of nontraded goods, as in Kemp. Some might prefer to restate the following results in the equivalent language of real balance effects (see Kemp for the connection).

FIGURE 4
FLUCTUATIONS IN INFLATION RATE

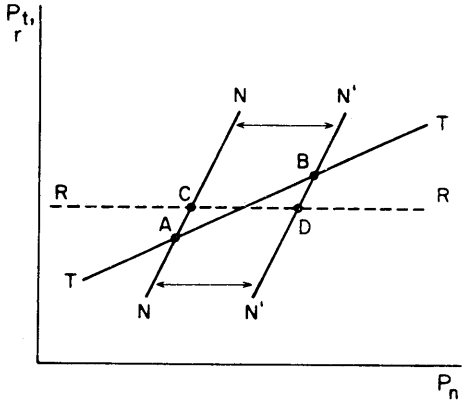


d. Exchange-Rate Policies for Stabilization

Since any economy is frequently buffeted by random shocks of various types, stabilization policies can be defined as policies devoted to maintaining internal and external balance in the face of such shocks. In the context of this model of a less developed country, the optimal exchange-rate policy from a stabilization point of view depends on the type of shock to which the economy is most frequently exposed. For example, if most shocks are generated by changes in the level of world prices relative to domestic prices, the goals of internal and external balance will be served best by a flexible-exchange-rate policy, as it will tend to insulate domestic prices from the effects of fluctuations in world prices. For example, in Figure 4 a country with no net capital imports is faced with random fluctuations in world price levels. A flexible exchange rate could allow the *TT* curve to remain unaffected by the world-price fluctuations. But a pegged exchange rate would cause domestic prices of tradables to fluctuate, say from *RR* to *R'R'*, so that prices, including those of nontradables, would fluctuate from point *A* to point *C*.

If instead most shocks come from temporary fluctuations in harvests or other domestic production, a pegged-exchange-rate policy achieved by use of reserves or borrowing is optimal. In Figure 5 we consider fluctuations in domestic production of the nontraded good. It is obvious that price fluctuations will be substantially reduced by pegging the exchange rate at a level indicated by the line *RR*, since the range is reduced from *AB* to *CD*. This result holds with much more force in the

FIGURE 5
FLUCTUATIONS IN DOMESTIC PRODUCTION



case of fluctuations in domestic production of the traded good, since the pegged exchange rate can wipe out the effects on prices of shifts in the *TT* curve.

If most shocks come from temporary shifts in the terms of trade, the situation is more complex. Let us begin with the case of sufficiently elastic demand for imports and assume that either export prices fall or import prices rise. Pegging the exchange rate prevents the other traded-good price from moving in the opposite direction, but prices of nontraded goods will move *more* under pegged exchange rates, as will the *average* price of traded goods. If import demand is inelastic, however, a rise in import prices will raise all prices under flexible exchange rates. Pegging the exchange rate will prevent the increase in the domestic price of the traded good whose world price has not changed and will therefore lead to a smaller movement in the price of nontraded goods.

e. The Effects of Worldwide Floating Exchange Rates

When the exchange rates of most of the major trading nations are floating, the model developed above needs to be modified to take account of the multiplicity of foreign price levels for tradable goods. The standard technique for dealing with a group of floating rates is the concept of an "effective exchange rate" (*Economic Report of the President,* 1974, pp. 220–226).

The effective exchange rate for a country can be defined as a weighted average of the exchange rates of its trading partners, with all rates being measured relative to some base year. An index can then be computed by comparing the *actual* dollar exchange rate of the country

to the weighted average of the dollar rates of its trading partners. The simplest type of weighting system is a *bilateral* system of weights, using export shares or import shares or an average of both. For example, an export-weighted effective-rate index can be defined as

$$e_j = \sum_{k \neq j} E_{jk} r_k, \qquad \text{index} = r_j / e_j ,$$

where the rates r_k are defined as units of currency k per dollar and E_{jk} = share of j's total exports going to k. Similarly, an import-weighted index, where M_{kj} = share of j's imports coming from k, can be defined as

$$e_j = \sum_{k \neq j} M_{kj} r_k , \qquad \text{index} = r_j / e_j .$$

These indexes give extremely useful information concerning the effect of shifts in world exchange rates on the competitive position of a given country. Nevertheless, they have at least two major shortcomings from the point of view of this essay. One generally acknowledged drawback is that bilateral-weight indexes ignore the effects of competition between the products of countries j and k in *third markets*. An additional problem is that an index of exchange rates is not a price index of tradable goods. Both of these limitations can in principle be resolved through the use of the IMF's Multilateral Exchange Rate Model (MERM) (Artus and Rhomberg, 1973).

When a less developed country is a major factor in the world market for one of its primary-product exports, it can indeed be shown that more complicated weights based on the MERM system are needed to measure the effects of exchange-rate changes on the prices of traded goods. But when the country can be regarded as a price taker for its imports, the import-weighted index given above is a good measure of the effects of floating rates in other countries on the less developed country's import prices. Similarly, if the country is one of a group of price takers with respect to its exports, an export-weighted index gives a useful measure of the effects of other countries' exchange-rate movements on its export prices (Black, 1976). The use of such measures is suggested in the next section.

4 Types of Exchange-Rate Policy in a World of Floating Rates

Utilizing the results of the previous two sections, we can now turn to the analysis of the various types of exchange-rate policy for a less developed country in a world of floating rates. The main focus is on the design of exchange-rate policy for stabilization with respect to external and internal disturbances, as discussed in section 3. The *variance* of the domestic relative price of tradable goods is taken to be the main,