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## The Theory of Devaluation

### An Interpretation of the Theory

The topic of devaluation<sup>1</sup> has exerted a strong attraction for both theoretical and applied economists. The complexities inherent in any analysis of a devaluation have come to light one by one, leaving behind them innumerable controversies and obsolete formulas. Why is it that after many years of studies on this topic, starting with Marshall in the nineteenth century, economists have found it so difficult to give a complete and unanimous theoretical answer to the question of devaluation and exchange rate stability? The answer must be found in the peculiar blend of relative price and real income effects produced by a devaluation. From considering devaluation as just a device affecting relative prices, economists swung to regarding it simply from the point of view of its impact on real expenditure, or "absorption." Only recently have both aspects of a devaluation been brought together into cumbersome marriages involving fearsome formulas and embracing concepts developed in microeconomics, defined holding income constant (for example, price elasticities), as well as concepts developed in macroeconomics and defined holding all prices constant (for example, the marginal propensity to save). And now we deal not with just one country but with at least a pair of countries.

One way to handle a purely theoretical analysis of the effects of devaluation would be to construct a complete general equilibrium model.<sup>2</sup> But such a model would inevitably get us lost in a "sea of

<sup>1</sup> Resulting from either a movement of an adjustable peg or a change in a freely fluctuating exchange rate.

<sup>2</sup> But the use of a general equilibrium model assuming full employment at all times, flexible prices, and Walras' Law presents some difficulties. It clearly becomes useless for the analysis of devaluation under conditions of unemployment. Furthermore, Walras' Law and deficits or surpluses in the balance of

coefficients." To get manageable results, simplifying assumptions are then in order. The history of the devaluation literature may be characterized as the continuous process of accusing one more simplifying assumption of destroying or at least limiting the validity or usefulness of previous results. More specifically, the theory has advanced by dropping some of the early assumptions regarding constancy of expenditures out of a given money income, and constancy of income itself. Such evolution provides a simple way of dividing the effects of devaluation on the trade balance into (a) the initial effect, associated mainly with the effects of the devaluation on relative prices; and (b) the reversal effect, associated mainly with real income changes. Although we shall discuss later the possibility of certain income effects occurring before the initial relative price effect, the traditional two stages will be examined first.

### *The Initial Effect*

Until 1950, all discussion regarding the impact of devaluation on the trade balance<sup>3</sup> could be summarized by the well-known partial-equilibrium formula involving the price elasticities of the somehow defined aggregate supply of exports and the equally aggregated demand for imports of each country<sup>4</sup> (usually two: "our" country and

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trade cannot be reconciled without some special and artificial assumptions. While in Keynesian models deficits or surpluses in the balance of trade are compatible with equilibrium in the national income, such is of course not the case with a general equilibrium model using Walras' Law.

<sup>3</sup> Most discussions have ignored capital movements that may be regarded as autonomous. The most important contributions to the devaluation literature up to 1950 are A. Marshall, *Money, Credit and Commerce* (London: Macmillan, 1924), Appendix J; C. F. Bickerdike, "The Instability of Foreign Exchange," *Economic Journal*, Vol. XXX, No. 1 (March 1920), pp. 118-122; Joan Robinson, "The Foreign Exchanges," *Essays in the Theory of Employment* (London: Macmillan, 1937); A. P. Lerner, *The Economics of Control* (New York: Macmillan, 1944), Chapter XXVIII.

The conditions for improvement in the balance of trade when devaluation takes place with a deficit or surplus, in either foreign or domestic currency, were worked out by A. O. Hirschman in "Devaluation and the Trade Balance," *Review of Economics and Statistics*, Vol. XXXI, No. 1 (February 1949), pp. 50-53.

<sup>4</sup> It was recognized, however, that these elasticities depend on the more fundamental elasticities of domestic demand and supply for importables and exportables within each country. The partial equilibrium formula may be found in L. A. Metzler, "The Theory of International Trade," in *A Survey of Contemporary Economics*, Vol. I, Howard S. Ellis, ed. (Homewood, Ill.: Richard D. Irwin, Inc., 1948).

The use of models involving only two goods avoids the index-number difficulties of defining aggregate demand and supply schedules for imports and exports.

the rest of the world). By assuming perfectly elastic supplies and a balanced trade before the devaluation, the formula reduces to the classic condition that a devaluation will improve the trade balance if the sum of the elasticities of the demand for imports and exports has an absolute value of more than one. If supply schedules are less than perfectly elastic, the requirements for a successful devaluation are less demanding. As a matter of fact, if the supply schedule of our exports has a zero elasticity, a devaluation can never worsen the trade balance in terms of foreign currency; but, of course, neither can it improve it by very much, unless there is an extraordinary elasticity in the demand for imports.

Whether because of the pleasing simplifications allowed by it or because the large amount of unemployed resources during the nineteen-thirties made it sound plausible, the assumption regarding perfectly elastic supply schedules for imports and exports soon was taken for granted, and economists divided into warring camps depending on their optimism or pessimism regarding the sum of the demand elasticities.

Much of the discussion<sup>5</sup> between optimists and pessimists centered around the precise meaning of elasticities. Confusion existed as to whether they should include only the initial price effect or the total impact of the devaluation, allowing income and other variables to change. Pessimists were mainly concerned with short-run price elasticities, which they deemed not high enough to meet the requirement for a successful devaluation. Optimists pointed out that one should look at both the elasticities of the goods already being traded and all the exports that would become feasible after a devaluation. Attempts by econometricians to settle the issue by empirical studies opened up fresh areas for debate and research, but settled nothing regarding the size of the elasticities.<sup>6</sup>

<sup>5</sup> For a sample of the discussion see A. J. Brown, "Trade Balance and Exchange Stability," *Oxford Economic Papers*, No. 6 (April 1942), pp. 57-75; P. T. Ellsworth, "Exchange Rates and Exchange Stability," *Review of Economics and Statistics*, Vol. XXII, No. 1 (February 1950), pp. 1-12; G. Haberler, "The Market for Foreign Exchange and the Stability of the Balance of Payments," *Kyklos*, Vol. III, No. 3 (1949), pp. 193-218; P. Streeten, "Elasticity Optimism and Pessimism in International Trade," *Economia Internazionale*, Vol. VII, No. 1 (February 1954), pp. 85-112; J. E. Meade, *The Balance of Payments* (London: Oxford University Press, 1951), and P. A. Samuelson, "Disparity in Postwar Exchange Rates," in *Foreign Economic Policy for the United States*, S. E. Harris, ed. (Cambridge, Mass.: Harvard University Press, 1948).

<sup>6</sup> Although early studies resulted in low price elasticities, more recent econometric research on United States and Canadian imports has yielded

Some optimists have based their opinion on purely theoretical grounds. It is pointed out that in a general-equilibrium setting, which assumes Walras' Law, static instability in the foreign-exchange market is not compatible with domestic stable markets.<sup>7</sup> Furthermore, it has been observed that even if a certain range exists at which the foreign-exchange market is unstable, movements from the unstable region must eventually find stable equilibrium points at *either* direction.<sup>8</sup>

The previous arguments, buttressed by the residual nature of foreign-trade demand and supply schedules, yield a strong theoretical presumption in favor of a high sum of the partial and static price elasticities, and thus for a favorable first effect. However, their potency in reassuring us of a substantial favorable total effect of the domestic devaluation on a trade balance is considerably reduced by their failure to take fully into account, along Keynesian lines, the income and price changes induced by a successful first effect.

It should be observed that the recovery of European economies and the removal of bottlenecks in production, which gave rise to price inelasticity in the immediate postwar period, suggest that the number of elasticity pessimists has diminished considerably since the 1945-1950 years. But as we now shall see, elasticity optimism assures us only of a successful first effect, not of a successful devaluation.

Other authors have pointed out that the lack of perfect competition in export industries will tend to assure us that a devaluation will not result in a deteriorating trade balance. Devaluation can at

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fairly high price elasticities of demand. The research on Canadian and United States imports has been done by M. C. Kemp and R. R. Rhomberg, respectively. It will be remembered that devastating criticism was levied against the initial estimates of price elasticities in foreign trade by G. Orcutt and others. For a bibliography on empirical studies on foreign trade elasticities, see Hang Sheng Cheng, "Statistical Estimates of Elasticities and Propensities in International Trade: A Survey of Published Studies," *Staff Papers*, Vol. VII, No. 1 (April 1958), pp. 107-158.

<sup>7</sup> E. V. Morgan, "The Theory of Flexible Exchange Rates," *American Economic Review*, Vol. XLV, No. 3 (June 1955), pp. 279-295.

<sup>8</sup> Egon Sohmen, *Flexible Exchange Rates* (Chicago: University of Chicago Press, 1961, pp. 5-17). Sohmen works with total elasticities in a general equilibrium context, which also assumes Walras' Law. Keynesian difficulties and complications are absent from such formulation. Minor theoretical objections to the necessity of finding stable equilibrium points in *either* direction have been raised within the framework of Sohmen's analysis by J. Bhagwati and H. G. Johnson, "Notes on Some Controversies in the Theory of International Trade," *Economic Journal*, Vol. LXX, No. 277 (March 1960), pp. 74-93. See also P. A. Samuelson, *op. cit.*, pp. 409-410.

worst leave unchanged the total expenditure of our country in terms of foreign currency on imports, and our monopolistic exporters will assure us that they will never work on the inelastic range of the foreigners' demand schedule for our exports.<sup>9</sup>

The widespread use of the assumption of perfectly elastic supply schedules in models considering only two goods, importables and exportables, has led to some unfortunate consequences. As we have seen, it has led to an exaggerated emphasis on the importance of demand elasticities for exports and imports, in the sense that it neglected to explore further the conditions in the domestic economy giving rise to such elasticities. When it is assumed that each country specializes in the production of only one good while consuming two, the further assumption of a perfectly elastic supply makes it difficult to introduce considerations of domestic income redistribution arising from the devaluation. The simple models assume constant costs and thus a constant domestic price for the good produced locally; constant wages, implicitly or explicitly; and, in general, constant rewards to other factors of production.

But perhaps the worst consequence of the use of two-good models in devaluation analysis, with or without perfectly elastic supplies, has been the misleading emphasis placed on changing the terms of trade to alter the balance of trade. Indeed, in a two-good model, a change in the terms of trade is imperative if devaluation is going to have any impact at all. And given the assumption of perfectly elastic supplies, the terms of trade to the devaluing country will grow worse in proportion to the extent of the devaluation. Although it is well known that no necessary link exists between a successful devaluation and a change, either way, in the terms of trade, the use of two-good models has obscured the basic fact that any change at all in the terms of trade is really an incidental by-product of the devaluation.

The best way to expose the weakness of two-good models with regard to devaluation is to consider the impact of devaluation on a country too small to have the terms of its trade affected.<sup>10</sup> In such a

<sup>9</sup> See A. Smithies, "Devaluation with Imperfect Markets and Economic Controls," *Review of Economics and Statistics*, Vol. XXXII, No. 1 (February 1950), pp. 21-23. Also H. Brems, "Foreign Exchange Rates and Monopolistic Competition," *Economic Journal*, Vol. LXIII (1953), pp. 289-298. Export taxes may also be used temporarily after a devaluation by a country that is not quite sure about the elasticity of the foreign demand for its exports.

<sup>10</sup> This special case has the advantage of permitting fairly simple representations of several issues in the literature in general equilibrium diagrams, as we

case a two-good model of importables and exportables becomes very ambiguous as the relative prices of imports and exports are left unchanged by the devaluation, leaving us with no mechanism to trigger off the desired reallocation of resources. Yet it should be obvious that an international price taker can use devaluation to correct a disequilibrium in its balance of payments just as well as a country that has some influence over its terms of trade (indeed, with more certainty of a successful outcome!). The neglected good in the analysis is of course the home-good or the nontraded good, whose

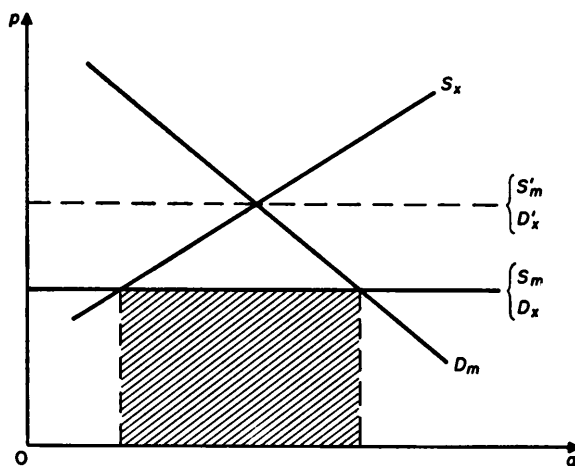


FIGURE 1.1. Initial impact of devaluation in a small country.

price is not directly linked to the exchange rate and whose relative price vis-à-vis imports and exports is affected by the devaluation, thus providing the mechanism for the desired reallocation of resources. The two-good models with perfectly elastic supply schedules provided only for a special type of resource reallocation, that is, from unemployment to the production of exportables. The more interesting reallocation problems were thus neglected.

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shall see later. Furthermore, the initial impact of a devaluation can be shown in a single diagram as in Figure 1.1. The vertical price axis is in terms of domestic currency. By appropriate choice of units, we combine in the same horizontal schedule the foreign supply of imports and demand for exports. A devaluation will shift the horizontal schedule upward. The original trade deficit (in domestic currency) is shown by the shaded area. In the diagram,  $D_m$  represents the domestic demand for imports;  $S_x$ , the domestic supply of exports. A similar criticism of two-good models including only importables and exportables is made in W. M. Corden, *Recent Developments in the Theory of International Trade*, Special Papers in International Economics, No. 7, Princeton University, March 1965, p. 22.

It could be argued, however, that the neglect of the case of the small country is justified on the grounds that devaluation will inevitably work in improving the balance of trade of a price taker (or at worst, leave it unchanged) as such a country faces a perfectly elastic demand for its exports. Yet, despite this, it seems that the key to a successful devaluation in long-term perspective (that is, reallocation of resources between the foreign and domestic sector) is neglected by the use of only two goods, whether or not they are produced at constant costs. The obsession with the sign of  $dB/dk$ , where  $B$  represents the balance of trade and  $k$  the exchange rate defined as units of domestic currency per unit of foreign currency, left little room to examine the different factors in a domestic economy that would assure us of not only a positive  $dB/dk$  but also of a large one. A devaluation in a country with a perfectly elastic foreign demand for its exports may achieve small results because of the failure of such country to reallocate resources internally and put more of them into the production of exportables and importables. By exportables here we mean not only those already in trade but also those which a country with fluid internal resources could develop after a devaluation. In studying the impact of a devaluation on the trade balance of many countries, it may be of greater importance to concentrate on the elasticities of supply of exportables and importables than on the elasticities of the foreign demand for exports and the net domestic demand for imports (which, of course, depends on the elasticity of the domestic supply of importables).<sup>11</sup>

Another objection to the use of two-good models in devaluation has been made on narrower technical grounds. It has been pointed out that a third nontraded good, money, must be assumed if a disequilibrium in the balance of trade is to exist. If we do not explicitly assume a *numéraire*, certain ambiguities will appear in the analysis. Such a third good is, however, usually assumed implicitly and need not cause us great concern.<sup>12</sup>

<sup>11</sup> It is regrettable that devaluation theorists have not paid more attention to the general position of the late F. Graham, who emphasized the dangers of relying exclusively on two-good models in international trade. An article by I. F. Pearce also puts emphasis on the role of devaluation in changing the relative prices between traded and nontraded goods rather than on the terms of trade. See I. F. Pearce, "The Problem of the Balance of Payments," *International Economic Review*, Vol. II, No. 1 (January 1961), pp. 1-28. See also R. Hinchshaw, "Further Comment," *Quarterly Journal of Economics*, Vol. LXXII, No. 4 (November 1958), pp. 616-625.

<sup>12</sup> This point has been made in connection with the slightly different stability conditions that emerge depending on whether a general-equilibrium model is used, assuming full employment and Walras' Law, or whether the partial-

Whether based on models with two or more goods, some other features of the initial impact of a devaluation have been discussed in the literature, giving rise to an amendment of the classical requirement for exchange stability. Laursen and Metzler<sup>13</sup> pointed out that if a devaluation or appreciation of the exchange rate does alter the terms of trade, the real income implied by a fixed physical output and a fixed level of money spending would be changed. Assuming an average propensity to spend which is higher at lower levels of real income than at higher levels, it follows that as the terms of trade become worse money spending would tend to increase in the devaluing country for a given level of employment and output. In other words, while we would move down along the real-spending schedule, the money-spending schedule would shift upward. The result of such an effect was to make the conditions for exchange stability more difficult to meet, as devaluation would lead to a worsening of the terms of trade and thus to an immediate upward shift in the money-spending schedule.<sup>14</sup>

It should be observed that even granting the original presumption regarding the sign of the effect, it does not follow that the chances of success of devaluation in models with more than two goods will be reduced by it, as we have seen that there is no necessary link between a devaluation and a given change in the terms of trade. A devaluation resulting in an improvement of the terms of trade will have this effect working in its favor.

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equilibrium model of, for example, Robinson is employed. The role of supply elasticities emerges as the main source of ambiguity. For a careful reconciliation of the different formulas (including J. E. Meade's formulation) see R. W. Jones, "Stability Conditions in International Trade: A General Equilibrium Analysis," *International Economic Review*, Vol. II, No. 2 (May 1961), pp. 199-209. See also footnote 2.

<sup>13</sup> L. Metzler and S. Laursen, "Flexible Exchange Rates and the Theory of Employment," *Review of Economics and Statistics*, Vol. XXXII, No. 4 (November 1950), pp. 281-299. In their model a devaluation had to adversely affect the terms of trade, because they used two goods with perfectly elastic supplies. See also A. C. Harberger, "Currency Depreciation, Income and the Balance of Trade," *Journal of Political Economy*, Vol. LVIII, No. 1 (February 1950), pp. 47-60.

<sup>14</sup> This effect was elaborated further by John Spraos in "Consumers' Behaviour and the Conditions for Exchange Stability," *Economica*, Vol. XXII, No. 86 (May 1955), pp. 137-151. Spraos points out that depending on what assumptions we make regarding consumer behavior, this effect may have different magnitudes and may even be changed in sign if a strong cash-balance effect exists. The importance of the effect was challenged on more empirical grounds by William H. White, "The Employment-insulating Advantages of Flexible Exchanges: A Comment on Professors Laursen and Metzler," *Review of Economics and Statistics*, Vol. XXXVI, No. 2 (May 1954), pp. 225-228.



It has already been noticed that this refinement of the criteria for exchange stability is not only ambiguous in sign but it is also considered to have small empirical importance.<sup>15</sup> Thus the classical condition for exchange stability may be used at least as a fairly accurate first approximation to the criteria for a successful first effect of a devaluation. This completes the examination of the first effect of a devaluation. During the analysis of the first effect, output and employment were assumed constant. We now turn to the repercussions of the initial effect on the economy.

### *Reversal and Total Effects of the Devaluation*

One way to handle the impact on the domestic economy of changes in the balance of trade is to assume that any increases or decreases in total domestic expenditure arising from the devaluation are swiftly offset by internal fiscal and monetary measures. In such a case, there will be no reversal effects, and the total effect of a devaluation will be the same as the immediate result.<sup>16</sup> But if no offsetting official policies are assumed, there will be further repercussions within the economies affected that will tend to cancel the initial effect of a devaluation, whether positive or negative. Total expenditure has changed after the first effect (unless the sum of the elasticities is exactly equal to one, in the simpler models) as a result of the change in the balance of trade and the possible shift in the money-expenditure schedule due to any change in the terms of trade. A successful devaluation will increase both domestic prices and income. Such increases will cancel part of the favorable initial effect, by stimulating expenditures on importables and exportables and by tending to increase the domestic price level; but, barring foreign-trade accelerators, the reversal factors can never on balance, change the direction of the initial effect of the devaluation.

The reversal (and thus the total) effects have also been analyzed using simple models, often using two goods and assuming perfectly elastic supplies.<sup>17</sup> The reversal term is a slightly more complex for-

<sup>15</sup> See for example C. P. Kindleberger, "Flexible Exchange Rates," essay in *Monetary Management*, prepared for the Commission on Money and Credit (Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1963), p. 415.

<sup>16</sup> This approach has been followed by J. Meade, *The Balance of Payments* (London: Oxford University Press, 1951).

<sup>17</sup> The fundamental contributions of A. C. Harberger, *op. cit.*, and S. S. Alexander, "Effects of a Devaluation: A Simplified Synthesis of Elasticities and Absorption Approaches," *American Economic Review*, Vol. XLIX, No. 1 (March 1959), pp. 22-42, contain the relevant formulas. For nonalgebraic presentations of the total impact of a devaluation, see J. Black, "A Savings and

mulation of the familiar income multiplier, having as key parameters each country's marginal propensity to save and to import. The initial effect times the reversal multiplier will give us the net increase in hoarding arising from the devaluation, that is, the net improvement in the trade balance. If the marginal propensity to save is zero in either country, the total effect of a devaluation will be zero (although its first effect may be very large and positive). In other words, and as it has been observed by several authors, elasticity optimism does not necessarily lead to devaluation optimism. Not only must the relative price elasticities be high but the marginal propensities to save must also be large. If the marginal propensities to import in both countries were zero (with positive marginal propensities to save) the total effect of devaluation would be reduced to the initial effect. Obviously, if the initial effect is zero, the total effect will also be zero, regardless of the nature of the marginal propensities.

This presentation of the total effects of devaluation avoided many of the difficulties of the pure absorption approach, introduced in the published literature by S. S. Alexander.<sup>18</sup> The pure absorption approach could be summarized by the statement that  $dB/dk$  will yield an improvement in the trade balance if and only if both of the marginal propensities to save (for each country) are positive. Such a statement is not true. The positive marginal propensities to save are necessary but not sufficient conditions for a successful devaluation. It may be argued that the pure absorption approach could be better summarized by saying that devaluation will work, say under full employment, if and only if domestic absorption is decreased relative to domestic output. Note that the first condition is of an *ex ante* nature, while the latter is of an *ex post* nature. The latter statement, as a matter of fact, is simply a truism. What was needed, and was provided by Alexander in his more recent article, was a

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Investment Approach to Devaluation," *Economic Journal*, Vol. LXIX, No. 274 (June 1959), pp. 267-274; H. G. Johnson, "Toward a General Theory of the Balance of Payments," in *International Trade and Economic Growth* (London: George Allen and Unwin, 1958), pp. 153-169; and E. M. Bernstein, "Strategic Factors in Balance of Payments Adjustment," *Review of Economics and Statistics*, Vol. XL, No. 1, Part 2 (February 1958), pp. 133-142. This chapter is particularly indebted to Professor Alexander's article, which originated the generalized distinction between the initial and the reversal effects.

<sup>18</sup> S. S. Alexander, "Effects of a Devaluation on a Trade Balance," *International Monetary Fund Staff Papers*, Vol. II, No. 2 (April 1952), pp. 263-278. It will be seen later that a similar approach was developed in 1948 by J. Polak of the International Monetary Fund.

description of the precise mechanism that induces a decrease in absorption, while giving full recognition to the initial effect of devaluation.

Was the development of the pure absorption approach useless? Far from it. It will be remembered that models such as Harberger's assumed *inter alia* constant costs all around, thus implying that we deal with conditions of less than full employment. Such models lose much of their significance when full employment is reached. One of the great virtues of the simple models, their precision in establishing functional relationships in a simple fashion, becomes the cause of their failure in explaining the effect of a devaluation at or near full employment. In such homogeneous models, which do not take into account income redistribution, money illusion, or the importance of asset holding in the demand functions, the real marginal propensities to save will have to equal zero when full employment is reached. Thus, for a devaluation undertaken at full employment, these models would yield a zero total effect, regardless of the size of the first effect. The stage is thus set for the pure absorption approach of Alexander. The main contribution of the pure absorption approach is then in the field of devaluation under full employment conditions. The emphasis is now properly placed on the ways and means by which total absorption can be cut. None of Alexander's "direct effects" can be revealed by the simple model of, for example, Harberger.

But even if we are at full employment, complete reliance on the pure absorption approach can be very misleading. Figure 1.2 presents the production-possibility frontier of a small, price-taking country which cannot by its own actions affect the terms of trade. In such a case, it is legitimate to lump exportables and importables into one Hicksian composite good,<sup>19</sup> which we may call the foreign (*F*) good. All other goods within the economy whose prices will not be affected directly by the exchange rate variations may be lumped into a composite home (*H*) good. If the exchange rate and the terms of trade are given and there are no tariffs or quantitative controls, the price ratio to consumers for *F* and *H* will be determinate and will yield an income-consumption line, such as *IC*, in Figure 1.2. There

<sup>19</sup> See J. R. Hicks, *Value and Capital* (2nd ed.; Oxford: Clarendon Press, 1946), pp. 33 and 312. "A collection of physical things can always be treated as if they were divisible into units of a single commodity so long as their relative prices can be assumed to be unchanged, in the particular problem in hand." (p. 33)

will be, of course, one income-consumption line for each exchange rate; the more devalued the exchange rate becomes, the more the  $IC$  line will shift toward the  $H$  axis. Given a certain percentage of devaluation, the precise degree of such a shift will depend on the shape of the indifference curves of all consumers. For the sake of simplicity, let us assume that the economy is made up of individuals having identical linear homogeneous utility functions. Under these circumstances, there will only be one  $IC$  line that will yield both internal and external equilibrium with full employment.

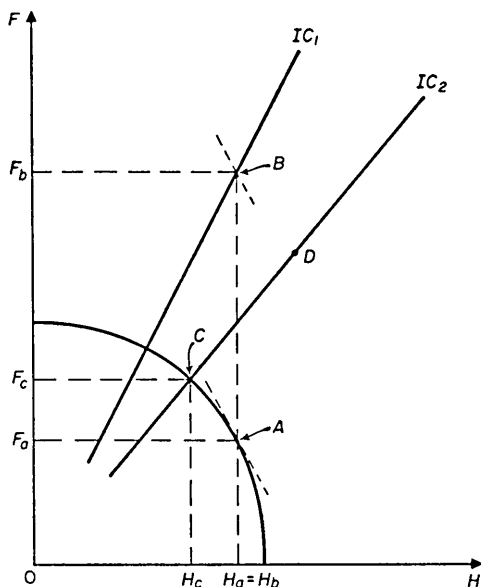


FIGURE 1.2. *Devaluation under full employment conditions.*

A disequilibrium in the balance of trade under conditions of full employment may be represented by two points. The country is producing at  $A$  and consuming at  $B$ , on  $IC$ , and is using an exchange rate that can never yield full-employment equilibrium in all markets. The price lines tangent to points  $A$  and  $B$  are, of course, parallel to each other. The deficit in the balance of trade is represented by the difference between  $F_b$  and  $F_a$ . It is assumed that the inflationary pressure has been released on foreign goods, that is, no excess demand exists for the  $H$  good and  $H_a = H_b$ . The  $H$  industry can only produce in equilibrium that amount of output which domestic real spending will absorb. The point along the  $IC$  line at which the

society will find itself will depend on the spending decisions of consumers, investors, and the government. While in a closed economy the inflationary gap implied by point *B* can never be observed ex post, in an open economy such a gap is very likely to result in a balance-of-trade deficit.

Suppose now that the authorities devalue the currency to precisely that exchange rate which is compatible with full employment and balance-of-trade equilibrium. The new income consumption line will be  $IC_2$  and *C* will be the only point at which both full employment and external balance are possible. To reach such a point, we need not only to cut absorption from  $F_b$  to  $F_c$  and from  $H_b$  to  $H_c$  but to *reallocate resources from the *H* industry to the *F* industry*; in other words, we must move along the production-possibilities frontier from *A* to *C*. A successful devaluation under conditions of full employment must, in general, cut down absorption and give rise to resource reallocation. Only in very special cases may a straightforward policy of deflation be enough. For example, if after a while we find ourselves producing at *C* and consuming at *D*, no devaluation is required; we would need only a deflationary fiscal and monetary policy to cut absorption. The pure absorption approach came dangerously close to regarding devaluation as just another deflationary policy, that is, by emphasizing movements along the  $IC$  lines it tended to neglect movements along the production-possibilities frontier. Such emphasis provides the justification to some of F. Machlup's criticism of S. Alexander.<sup>20</sup>

Figure 1.2 also shows that different combinations of exchange-rate and income policies may be required to achieve full employment and balance-of-trade equilibrium, depending on which region of the diagram we are at originally. The typical situation given by points *A* and *B* has been depicted, calling for both deflationary policies and devaluation.<sup>21</sup>

<sup>20</sup> F. Machlup, "Relative Prices and Aggregate Spending in the Analysis of Devaluation," *American Economic Review*, Vol. XLV, No. 3 (June 1955), pp. 255-278. We will see in the next chapter, however, that it may be useful to concentrate on the deflationary aspects of devaluation in the short run, while leaving the reallocation of resources for the long run.

<sup>21</sup> The alternative policy combinations which may be required have been examined in detail by W. M. Corden in "The Geometric Representation of Policies to Attain Internal and External Balance," *The Review of Economic Studies*, Vol. XXVIII(1), No. 75 (October 1960), pp. 1-19. This article employed geometrical techniques similar to those used here, and which seem to have been originally developed by W. E. G. Salter, "Internal and External Balance—The Role of Price and Expenditure Effects," *Economic Record*, Vol. XXXV, No. 70 (April 1959), pp. 47-66. This type of analysis has recently been

The foregoing analysis does not go into the details of how a society moves up and down along the *IC* lines. Such movements would be associated with changes in real aggregate demand. The Alexander "direct effects" of devaluation (cash balance, redistribution, money illusion, and so forth) would tend to push us down along the *IC* curve.<sup>22</sup> Fiscal and monetary policies have an obvious importance in determining our position along the *IC* lines. Thus, the reversal effect of a devaluation will also be greatly influenced by the types of policies assumed.<sup>23</sup>

We have now completed the review of the standard two-stage analysis of the impact of devaluation on the trade balance. Before we turn to a preview of the ways in which the next chapter will modify this standard analysis, some other issues related to devaluation will be discussed.

### *Devaluation and the Price Level*

In most of the theoretical literature on devaluation, it has been assumed that a devaluation will increase the domestic prices of importables and exportables not only relative to other prices in the economy but also in absolute amounts. Indeed, this is the fundamental mechanism that triggers off the first effect of devaluation. Thus, a price index that includes importable and exportable commodities as well as nontraded goods is bound to show an increase.

While such a result is self-evident in the case of a devaluation taking place without any other changes in trade policy, it has been argued that the joint effect of devaluation *and* a removal of quantitative controls over trade may well be a fall in the general level of prices.<sup>24</sup> The argument is based on the following key assumptions:

- a. An unchanged balance of trade, although presumably both exports

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extended by R. A. Mundell, "The Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability," *International Monetary Fund Staff Papers*, Vol. IX (March 1962), pp. 70-79.

<sup>22</sup> Although as we will see later, income redistribution will also shift the *IC* line if different groups in the society have different tastes.

<sup>23</sup> It has been argued by F. Machlup, *op. cit.*, that (even assuming plentiful exchange reserves) a balance-of-trade disequilibrium will eventually come to an end simply by the refusal of the monetary authorities to replenish the money loss implied by the deficit in the balance of trade. Presumably high interest rates will push us down along a given *IC* line, cutting absorption in a purely deflationary way. But while we can always get balance-of-trade equilibrium by deflationary means, a devaluation is required if the goal of full employment is also to be reached.

<sup>24</sup> The main exponent of this point of view is Egon Sohmen, *op. cit.*, pp. 102-111.

- and imports will increase after the adoption of both policy measures.
- b. An unchanged money value of total domestic absorption. Although not necessary for the argument, full employment is assumed.
- c. Completely flexible prices (this is implicitly assumed).

After removal of quantitative controls and devaluation, we shall reallocate resources so as to specialize more along the lines of our comparative advantage. Less home and import-competing goods and more export goods will be produced. Since such a reallocation of resources must presumably make us better off (that is, in some quantitative or qualitative sense it must increase the quantity  $Q$  produced with the same amount of resources as before) and by assumption the total money value of domestic absorption is fixed ( $\Sigma PQ = \text{constant}$ ), it clearly follows that the price level  $P$  must fall.<sup>25</sup> Once again it is shown that autarky is less desirable than specialization along the lines of comparative advantage.

While the conclusions follow from the assumptions, the latter may strike most people as unrealistic when applied to actual cases of devaluation. The reallocation of resources from home goods to export goods must take place under full-employment conditions in such a smooth manner that the current value of domestic absorption is unchanged. Presumably resources are bid away from home and import-competing industries, whose prices must fall, by the expanding export industries, whose prices have risen. No asymmetry in price responses is allowed. The increases in investment necessary for the process of reallocation will be forthcoming from a reduction in consumption, brought about without general price increases. The realism of such implications may be questioned.

The argument, furthermore, can be applied strictly only in the case of an unchanged balance of trade. As a matter of fact, the argument implies that in spite of devaluation, the level of imports will increase following the removal of import restrictions. It is perhaps more interesting to consider what will happen to the price level when we want to cut down real domestic absorption relative to output, that is, reduce the trade-balance deficit. In attacking the exaggerated fears that devaluation will set off an inflationary spiral, Sohmen is willing to give away a potent tool in bringing about a cut in real absorption, that is, devaluation-induced increases in the general price level.<sup>26</sup>

<sup>25</sup> For simplicity, assume constant terms of trade.

<sup>26</sup> R. Hinshaw, "Further Comment," *Quarterly Journal of Economics*, Vol. LXV, No. 4 (November 1951), pp. 447-462.

It should be observed, however, that Sohmen is quite willing to admit that resource reallocation may take time, and therefore, prices may rise in the short run after a devaluation. Even in the short run, the removal of quantitative restrictions on imports will offset the impact on domestic import prices of the changes in the exchange rate. But if in the short run the quantity of exports is fixed and we postulate a fixed balance of trade, we must not allow the domestic price of importables to fall, as this would encourage larger imports. Thus, given the increase in the domestic price of exports, the price level must rise in the short run.

In a recent paper,<sup>27</sup> Professor Harberger has given powerful support to the standard view that a devaluation can be expected to have a strong impact on the domestic price level. On the basis of assumptions that are influenced by Argentine and other Latin American conditions, he concludes that a devaluation of about 50 per cent (an increase by 50 per cent of the domestic price of one unit of foreign currency) will probably result in increases of the price level of between 24 and 30 per cent, depending on the values of some key parameters. Besides the direct impact of devaluation on the prices of exportables and importables, he also takes into account price increases forthcoming from attempts to switch expenditures from these to other goods.

### Final Remarks

The next chapter will differ from most other analyses of devaluation by its emphasis on the short-run impact of devaluation and on the income redistribution arising from a devaluation.

The emphasis on the short run should not be taken as an attempt to diminish the importance of resource reallocation for the long-run success of devaluation. While it is recognized that the essence of devaluation is the inducement it provides for a reallocation of resources, we must also analyze its short-run impact, which may be quite potent in improving the balance of trade before any resources are reallocated.

A discussion of income redistribution arising from devaluation could be introduced in several ways. For example and still well within neoclassical equilibrium analysis, we could postulate (a)

<sup>27</sup> Arnold C. Harberger, "Some Notes on Inflation," in *Inflation and Growth in Latin America*, edited by Werner Baer and Isaac Kerstenetzky (Homewood, Ill.: R. D. Irwin, Inc., 1964).



different factor intensities in the home-good and foreign-good industries and (b) different tastes for different groups within the economy. A devaluation by changing relative prices would create a different pattern of output, thereby affecting returns of the factors of production. Furthermore, we may make different assumptions (with or without postulate *a*) regarding the expenditure patterns on home and foreign goods of different groups in society, either because of different indifference maps or because of different positions in the same map of indifference curves.<sup>28</sup>

Chapter 2 will introduce an assumption that, although not in the neoclassical spirit of marginalism, will nevertheless present a more accurate picture of reality in the short run. This assumption, when coupled with assumptions regarding the expenditure patterns of different social groups, suggests that a redistributive effect will occur prior to the classical initial effect of devaluation. It should be observed that under such assumptions the income redistribution will be characterized not only as a real-income transfer from the sector of the economy producing home goods to those sectors producing importables and exportables but also, more accurately, as a real-income transfer from wage earners, wherever they may be employed, to non-wage earners of the import-competing and export industries.

Although several authors have made passing remarks about the impact of a devaluation on income distribution,<sup>29</sup> only two other attempts to analyze the full implications of the redistributive effect could be found in the devaluation literature.

An early, incomplete attempt can be found in an unpublished paper of J. J. Polak.<sup>30</sup> Polak discusses the implications of a wage lag,

<sup>28</sup> For illustrations on how these assumptions can be introduced in a geometric general equilibrium presentation, see P. B. Kenen, "Distribution, Demand and Equilibrium in International Trade," *Kyklos*, Vol. XII (1959), pp. 629-638, and H. G. Johnson, "International Trade, Income Distribution and the Offer Curve," *The Manchester School of Economic and Social Studies*, Vol. XXVII, No. 5 (September 1959), pp. 241-260. Professor W. M. Corden has suggested to me that the factor intensity argument could be generalized to say that devaluation raises real incomes of those factors which are predominant in producing tradables relative to those factors which are dominant in consuming tradables.

<sup>29</sup> It will be remembered that one of Alexander's "direct effects" was a redistributive effect. But Alexander does not explore it fully, particularly neglecting its relation in time to the first effect of devaluation.

<sup>30</sup> J. J. Polak, "Depreciation to meet a situation of overinvestment," Document of the Research Department of the International Monetary Fund, September 1948 (prepared in consultations with I. S. Friedman, W. R. Gardner, J. Marquez,

but his failure to specify a complete model leaves a number of ambiguities in the analysis. A second effort can be found in a paper by J. Spraos,<sup>31</sup> whose main interest is the possibility that a devaluation-induced shift in income distribution may present a new source of instability in the foreign-exchange market.

Pertinent contributions of the literature on the impact of devaluation on the economy and the trade balance of the devaluing country have been critically discussed in this chapter. Chapter 2 will now explore several amendments and extensions to the established theory of devaluation, which are deemed to be necessary before such a theory is utilized to analyze the effects of devaluation in a semi-industrialized economy.

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and F. Pazos). This paper also presented the basic outlines of what later came to be called the "absorption approach" to devaluation. The models that will be presented in the next chapter contain ideas similar to those of the Polak paper which, incidentally, was motivated by a study of the Mexican devaluation of 1948/1949. E. M. Bernstein refers to the Polak paper in his article "Strategic Factors in Balance of Payments Adjustment," *International Monetary Fund Staff Papers*, Vol. V (1956/1957), p. 159, where he states: "A devaluation will, for a time, bring about a shift in the distribution of income, so that if wages lag, the proportion of income going to receivers of profits will rise."

<sup>31</sup> J. Spraos, "Stability in a Closed Economy and in the Foreign Exchange Market, and the Redistributive Effect of Price Changes," *Review of Economic Studies*, Vol. XXIV(3), No. 65 (June 1957), pp. 161-176.

# 2

## Some Extensions of the Theory of Devaluation

A central theme will dominate this chapter: the search for explanations to the paradox of devaluations that succeed in improving the balance of trade, but which are accompanied by a drop in the real output of the economy. As shown in Chapter 1, existing devaluation theory distinguishes two stages of the impact of devaluation on the trade balance: the initial effect, whose size and sign will be determined primarily by the price elasticities of demand and supply of imports and exports, and the reversal effect, which always works against the first effect mainly through the income mechanism, and which tends to offset the original impact of the devaluation on the trade balance. Thus, according to this theory, a first effect that is successful in improving the balance of trade will also result in an increase in real domestic output by stimulating the production of exports and import-competing goods. Through the income multiplier, such expansionary stimulus will spread to other sectors of the economy. On the other hand, a devaluation yielding a negative initial effect will cause domestic output to decrease.

If the devaluation takes place under conditions of full employment, the absorption approach would indicate the need to cut down total real expenditures to bring them into line with the full-employment output; but such an approach would not predict a drop in aggregate production.<sup>1</sup>

<sup>1</sup> However, as the devaluation is likely to induce a reallocation of resources, frictions may appear in such a process, producing unemployment and excess capacity in some sectors. In principle such unemployment could be offset by expansion in other sectors, but asymmetries may prevent a smooth adjustment in reality.