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Author(s): Carlos F. Díaz Alejandro

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## A NOTE ON THE IMPACT OF DEVALUATION AND THE REDISTRIBUTIVE EFFECT<sup>1</sup>

CARLOS F. DÍAZ ALEJANDRO  
Yale University

### I

IT HAS become customary in the theoretical literature dealing with the impact of devaluation on the trade balance to distinguish two stages of such an impact: the initial effect and the reversal effect.<sup>2</sup> The sign and size of the first effect will be determined by the price elasticities of demand and supply of imports and exports.<sup>3</sup> While the first effect depends on changes in relative prices, the reversal effect depends mainly on the income mechanism and tends to offset the original impact of the devaluation on the trade balance. Although the initial and reversal effects arise from static models, a time se-

<sup>1</sup> I would like to thank Professors Charles P. Kindleberger, of the Massachusetts Institute of Technology, and George L. Perry, of the University of Minnesota, for their helpful comments. I am also indebted to the referee of this *Journal* who read an earlier version of the note and suggested a useful streamlining of the argument.

<sup>2</sup> See, for example, S. S. Alexander, "Effects of a Devaluation: A Simplified Synthesis of Elasticities and Absorption Approaches," *American Economic Review*, XLIX (1959), 22-42. For a prenatal marriage of the elasticities and absorption approaches see A. C. Harberger, "Currency Depreciation, Income, and the Balance of Trade," *Journal of Political Economy*, LVIII (1950), 47-60. Policy-oriented models of devaluation have been more fully developed by J. E. Meade and J. Tinbergen. See Meade, *The Theory of International Economic Policy*, Vol. I: *The Balance of Payments* (London: Oxford University Press, 1951); and Tinbergen, *On the Theory of Economic Policy* (Amsterdam: North-Holland Publishing Co., 1952).

<sup>3</sup> Plus the Laursen-Metzler effect, if any. See S. Laursen and L. A. Metzler, "Flexible Exchange Rates and the Theory of Employment," *Review of Economics and Statistics*, XXXII (1950), 281-300; also A. C. Harberger, *op. cit.* A complete analysis would also take into account a possible de-stocking effect. See H. G. Johnson, *International Trade and Economic Growth* (Cambridge, Mass.: Harvard University Press, 1961), chap. vi.

quence is suggested by their names and nature, with the reversal effect coming into play only after the first effect has taken place. A further implication is that a successful first effect will tend to increase real domestic output by stimulating the production of exports and import competing goods. Through the multiplier such expansionary stimulus will spread to other sectors of the economy. As long as the reversal effect does not fully offset the initial effect, a successful devaluation will be associated with both an expansionary pressure on output and an improvement in the balance of trade. On the other hand, a devaluation yielding a negative initial effect (a worsening of the trade balance) will result in a decrease of domestic output. An observer of devaluations in the real world may thus be puzzled to find several devaluations that have resulted in quick improvements in the balance of trade and were accompanied by decreases in the level of total output in those economies. It could be argued that the decrease in output was due simply to deflationary fiscal and monetary measures adopted simultaneously with the devaluation of the exchange rate. However, it may be of interest to investigate whether at least part of the decreases in output may be explained solely as a *direct* result of the devaluation.

This note shows that the apparent paradox of a devaluation leading to an improvement in the trade balance *and* a decrease in domestic output can be explained by a redistributive effect caused by the devaluation. This redistributive effect is likely to precede the initial, or relative, price effect. Even "elasticity optimists" do not expect price elasticities to be very high in the short run and rely on such devices as short-term capital movements to fill the gap between the

time a devaluation takes place and the time when the balance of trade will respond favorably to the change in relative prices induced by the devaluation. In many cases the redistributive effect may be a more powerful and speedy mechanism in filling this gap.

It is well known that a devaluation may have a redistributive effect,<sup>4</sup> but the importance and timing of it has received little emphasis in the literature. I suspect that the theoretical point raised here may prove important in any attempt to fit the empirical analysis of recent devaluations in semi-industrialized economies into accepted devaluation theories and models.

## II

For the purposes of this note it will be sufficient to examine the relatively simple case of a small country faced with a perfectly elastic demand for its exports and a perfectly elastic supply of its imports, both in terms of foreign currency units. Let us originally consider three goods: importables ( $M$ ), exportables ( $X$ ), and the home good ( $H$ ), which does not enter into international trade. Because we have assumed that the terms of trade for our country are set exogenously, it is legitimate to lump exportables and importables into a single Hicksian composite good,<sup>5</sup> which we may call the foreign good, ( $F$ ).

Several assumptions regarding the domestic supply schedules could be made. To em-

phasize the redistributive effect it will be assumed that the domestic supply schedule for the output of  $F$  is perfectly elastic for downward movements of output and perfectly inelastic for increases in output, at least in the short run. Assume that the supply schedule for  $H$  is perfectly elastic. The supply schedules are both perfectly elastic with respect to downward movements of prices due to the rigidity of money wage rates (an assumption which will be introduced below). Thus, decreases in the demand for  $H$  will result in a lower level of output and higher unemployment, but no change in the price of  $H$ . The domestic price of  $F$  will be solely determined by its foreign price and the exchange rate. These assumptions imply that there are idle resources which even in the short run can be put to work productively in the  $H$ -industry, although this is not possible in the case of the  $F$ -industry because of the nature of its production function. If some elasticity were allowed to the domestic production of  $F$  with respect to increases in its price, a decrease in domestic output following a devaluation would become less likely.

Our country can be divided into two social classes: wage earners and capitalists. Each class will be assumed to be composed of individuals of identical tastes, who consume both  $H$  and  $F$  and save part of their income. Total money wages and profits will be determined by the total output produced domestically and by the money wage rate, assumed to be the same in both  $H$ - and  $F$ -industries and constant, at least in the short run.

Under these assumptions we can now

<sup>4</sup> One of S. S. Alexander's "direct effects" of devaluation was the redistributive effect. See his "Effects of a Devaluation on a Trade Balance," *International Monetary Fund Staff Papers*, II (1951-52), 263-79; see also J. Spraos, "Stability in a Closed Economy and in the Foreign Exchange Market, and the Redistributive Effect of Price Changes," *Review of Economic Studies*, XXIV (1956-57), 161-76. A pioneering but unpublished 1948 paper by J. J. Polak (prepared in consultation with I. S. Friedman, W. R. Gardner, J. Marquez, and Felipe Pazos), "Depreciation To Meet a Situation of Overinvestment," outlined not only the absorption approach but a redistributive effect as well. E. M. Bernstein refers to the Polak paper and to the redistributive effect in his article, "Strategic Factors in Balance of Payments Adjustment," *International Monetary Fund Staff Papers*, V (1956), 159.

<sup>5</sup> See J. R. Hicks, *Value and Capital* (2d ed. Oxford: Clarendon Press, 1946). "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). The traditional use in the literature of two-good models including only imports and exports has led to an exaggerated emphasis on the analysis of the impact of devaluation on the terms of trade, while neglecting the more basic relations between the price of the home good and the domestic prices of imports and exports.

show that following a devaluation the balance of trade may improve while total domestic output falls. To simplify the analysis, we shall deal only with the impact effect of devaluation without working out the full solution of the model.

Let

$F_s$  = total initial local production of  $F$

$F_c$  = initial consumption of  $F$  by capitalists

$F_w$  = initial consumption of  $F$  by workers

$m_{fc}$  = marginal propensity of capitalists to consume  $F$

$m_{fw}$  = marginal propensity of workers to consume  $F$

$m_{hc}$  = marginal propensity of capitalists to consume  $H$

$m_{hw}$  = marginal propensity of workers to consume  $H$

$s_c = 1 - m_{hc} - m_{fc}$

$s_w = 1 - m_{hw} - m_{fw}$

$E_{hf}$  = cross-elasticity of demand for  $H$  with respect to the price of  $F$ , including only the pure substitution effect. For the sake of simplicity, this substitution effect is assumed to be the same for workers and capitalists.

It will be assumed that by an appropriate choice of units we originally set all prices equal to one and that the rest of the world adjusts passively to the changes in the balance of trade of our small country.

Devaluation will raise the price of  $F$  in domestic currency,  $p_f$ , in proportion to the increase in the price of foreign currency. Thus, the impact effect of devaluation will result in an increase of the real income of capitalists of  $(F_s - F_c)d p_f$  and a decrease in the real income of workers by the amount  $F_w \cdot d_f$ , since the money wage rate is unchanged.

The impact of the devaluation on domestic output will be examined first. As the domestic output of  $F$  is being assumed perfectly inelastic with respect to increases in  $p_f$ , the result depends on changes in the domestic output of  $H$ , which is in turn de-

termined by the level of domestic demand. As a result of devaluation, the change in demand for  $H$  will be given by the following expression, which includes the real-income effect for capitalists and workers, plus the pure substitution effect arising from the change in the price of the foreign good:

$$dH = [m_{hc}(F_s - F_c) - m_{hw}F_w] + HE_{hf}d p_f. \quad (1)$$

If we assume trade is initially balanced, then  $F_s - F_c = F_w$ , so that (1) can be simplified to:

$$dH = [(m_{hc} - m_{hw})F_w + HE_{hf}]d p_f. \quad (2)$$

The pure substitution effect in (2),  $HE_{hf}$ , will switch expenditures away from  $F$  and into  $H$ , thus inducing a higher level of output in the  $H$ -industry. However, this effect may be offset if  $m_{hw}$  is sufficiently larger than  $m_{hc}$ . The condition  $m_{hc} > m_{hw}$  is likely to be met in many countries, as the capitalists will tend to have an expenditure pattern (consumption plus investment) more biased toward imports than workers and are likely to save a higher proportion of their income. It should be noted that the  $m$ 's are to be interpreted as marginal propensities to consume *and invest*. Capitalists carry out the investment of the economy, which in many countries has a higher  $F$  component, both average and marginal, than consumption spending.

Furthermore, especially in the short run,  $E_{hf}$  could be small for many semi-industrialized countries, so that the conditions  $m_{hw} > m_{hc}$  and  $|(m_{hc} - m_{hw})F_w| > HE_{hf}$  can be realized, yielding a decrease in the level of domestic output following a devaluation.

It remains to be shown that expression (2) can yield a negative result while the balance of trade improves. The balance of trade is equal to the difference between the domestic supply of  $F$  and its domestic demand. Since the supply of  $F$  is fixed, improvement in the balance of trade will follow so long as there is a decrease in the domestic demand

for  $F$ . The impact income effect of the devaluation on the demand for  $F$  will be:

$$[m_{fc}(F_s - F_c) - m_{fw}F_w]d\phi_f. \quad (3)$$

The pure substitution effect will simply be the negative of the pure substitution effect on the demand for  $H$ , or  $-HE_{hf} \cdot d\phi_f$ ,<sup>6</sup> so that the total impact effect of devaluation on the demand for  $F$  is:

$$dF = [m_{fc}(F_s - F_c) - m_{fw}F_w - HE_{hf}]d\phi_f. \quad (4)$$

Equation (4) can be made directly comparable with (2) by using the relations  $s_c + m_{fc} + m_{hc} = 1$  and  $s_w + m_{fw} + m_{hw} = 1$ .

This yields the following alternative expression:

$$dF = [(F_s - F_c - F_w) - (s_c + m_{hc})(F_s - F_c) + (s_w + m_{hw})F_w - HE_{hf}]d\phi_f. \quad (5)$$

If we assume initially balanced trade,<sup>7</sup> we obtain for the impact effect of devaluation on the demand for  $F$ :

$$dF = [(s_w - s_c)F_w + (m_{hw} - m_{hc})F_w - HE_{hf}]d\phi_f. \quad (6)$$

Comparing equations (6) and (2), it can be seen that the last two terms in the square brackets are the same, but with opposite sign. Thus, if these were the only two terms in the expression for the impact effect of devaluation on the demand for  $F$  it would follow that the output of home goods will

<sup>6</sup> The pure-substitution effect between  $F$  and savings is neglected to keep the argument simple.

<sup>7</sup> A deficit in the balance of trade at the time of devaluation will tend to make eq. (5) negative, therefore contributing to an improvement in the trade balance. It will also tend to make eq. (1) negative, making a decrease in home output more likely.

increase only when the demand for  $F$  decreases (and thus the balance of trade improves), and vice versa. But the term  $(s_w - s_c)F_w$  in equation (6), which does not appear in expression (2), is almost certain to be negative, thus making it possible, and for many semi-industrialized countries likely (especially in the short run), that the balance of trade will improve as a result of devaluation while home output falls.

Equations (6) and (2) also show the possibility of another interesting result. If  $E_{hf}$  and  $(s_w - s_c)$  are sufficiently small, and  $(m_{hw} - m_{hc})$  has a high positive value, a devaluation would lead to a *worsening* of the trade balance and a fall in domestic output. The redistributive effect of devaluation, in other words, introduces a new potential source of instability in the foreign exchange market.<sup>8</sup>

The results obtained here depend importantly on having low values for  $E_{hf}$  and the elasticity of supply of the  $F$ -industry. More generally, the greater the ability of a country to substitute one good for another in its consumption and investment and the greater its capacity to transform in production, the more likely will be an improvement in both the balance of trade and in home production following a devaluation.

The other key assumption made was the constancy of money wage rates. This leads unambiguously to an increase in total money profits in the  $F$ -industry. However, total money profits in the  $H$ -industry will fall when equation (2) yields a negative result. Therefore the net effect on total money (and real) profits will depend on the full multiplier effects of the devaluation on the  $H$ -industry. But the profit share in the national product will necessarily improve as a result of devaluation even after these full effects.

<sup>8</sup> This point was stressed by J. Spraos, *op. cit.*