

Discussion Paper No. 9108

August 1991

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A Review Of Theory

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### Abstract

This paper reviews the literature on the theory of devaluation. The various approaches to the analysis of devaluation that are discussed in the paper are complementary and represent different views of the same phenomenon. Thus, in analyzing the effects of devaluation, one must use a combination of several approaches. In addition, one must take into account the issues pertaining to the distributional effects, the pessimistic consequences, and the effectiveness of devaluation.

# THE EFFECTS OF DEVALUATION: A REVIEW OF THEORY

by

Fidelina B. Natividad-Carlos\*

## 1. Introduction

There are several approaches used to analyze the effects of devaluation and the mechanism through which it corrects payments imbalance. There are likewise several papers which have reviewed some of these approaches; for instance, Cooper (1971) has reviewed the elasticities, absorption, and monetary approaches while Edwards (1985) has reviewed, in addition to these three approaches, the Keynesian, synthesis and new structuralist approaches. In this paper, we review not only these above-mentioned approaches but also the different models under the Keynesian and monetary approaches as well as the approach that has only been recently developed, the so-called new classical approach. Thus, in this paper, we look at the following approaches, namely: (1) the elasticities approach; (2) the absorption approach; (3) the Keynesian approach - a simple Keynesian model with fixed interest rate, wages and prices, the Mundell-Fleming model with flexible interest rate but fixed prices and wages, and a Keynesian model of aggregate supply - aggregate demand with flexible interest rate, wages and prices; (4) the monetary approach - a monetary model with traded goods and a monetary model with traded and nontraded goods; (5) a (Keynesian-monetarist) synthesis approach; (6) the new classical approach; and, (7) the new structuralist approach. These approaches, although quite different, are complementary rather than competitive because they represent different views of the same phenomenon.

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## 2. Theories

### 2.1. The Elasticities Approach

The elasticities approach is a Marshallian partial-equilibrium approach which focuses on how a change in the relative price or terms of trade brought about by a devaluation causes substitution between goods, both in consumption and in production. Under this approach, the effects of devaluation are as follows: (1) relative prices will be affected since domestic prices are assumed to be fixed and completely independent of the exchange rate; (2) exports will be stimulated, imports will decline, and the trade balance will improve as long as the Marshall-Lerner condition (that the sum of the price elasticities of demand for exports and imports exceeds unity) holds; and, (3) output and employment may increase or decrease (the approach is not explicit since it is a partial equilibrium approach).

### 2.2. The Absorption Approach

In contrast to the elasticities approach, the absorption approach focuses on the economy as a whole and emphasizes income effect. It uses the identity income less absorption equals the trade balance, implying that any improvement in the trade balance requires excess of income over absorption. Its basic postulate is that when resources are fully employed, a devaluation cannot improve the current account balance unless domestic absorption (expenditure) is reduced to accommodate the expenditure-switching effect of the devaluation. An important insight of this approach is its distinction of the two ways in which policies can affect the trade balance: expenditure-reducing which requires expenditure to fall in relation to real income and expenditure-switching which requires the composition of expenditure to move from foreign to domestic goods.

The effects of devaluation under this approach are as follows: (1) relative prices will be affected if devaluation works through expenditure-switching; (2) trade balance will improve if devaluation reduces expenditure relative to income because of expenditure-reducing or expenditure-switching; and, (3) aggregate output may increase if there are unutilized resources and, in general, a devaluation that has a positive effect on relative prices and generates expenditure-switching will have positive effect on output.

## 2.3. The Keynesian Approach

### 2.3.1. A Simple Keynesian Model

The elasticities approach is based on a partial equilibrium analysis of the trade sector alone while the absorption approach is more concerned with the macroeconomic response to devaluation. Nevertheless, since devaluation has price and income effects, the two approaches can be integrated. This simple Keynesian model with fixed domestic price level and interest rate integrates the two approaches. In this model, at the initial level of output, a devaluation will lower the relative price of domestic goods or the terms of trade. Given that the Marshall-Lerner condition is satisfied, it will exert an expenditure-switching effect in favor of domestic goods and the trade balance will improve. The resulting increase in production and income will induce imports to rise, thereby dampening the initial improvement in trade balance and income so that the trade balance will improve by an amount smaller than the switch in expenditure defined by the Marshall-Lerner condition. However, it will have a positive multiplier effect on income and such effect will depend not only on the multiplier but also on the sum of demand elasticities for exports and imports.

In sum, the effects of devaluation are as follows: (1) relative prices will always be affected because domestic prices are given and not affected by

devaluation; (2) trade balance will improve as long as the Marshall-Lerner condition holds; and, (3) with demand-determined output, a devaluation will be expansionary; it will increase net exports, aggregate output, and employment.

Using this "Keynesian" model, it can be shown that an expansionary policy and an expenditure switching policy (devaluation) will raise income and improve the trade balance and, thus, cure a deficit-unemployment problem.

### 2.3.2. The Mundell-Fleming Model

The Mundell-Fleming model is an open economy extension of the IS-LM model. This model assumes that the domestic price level is fixed but that the nominal interest rate can change. Devaluation will lower the price of domestic relative to foreign goods and increase net exports and therefore aggregate demand. Its impact effect will be to move to a new short-run equilibrium where income and interest rates are higher and there is a surplus. Over time, increases in the money supply resulting from surpluses will drive the economy to a long-run equilibrium where income is even higher but interest rate is lower, the (flow) balance of payments surplus initially created by the devaluation is eliminated, and the cumulative increase in reserves is equal to increase in the long-run equilibrium size of the nominal money supply.

### 2.3.3. Keynesian Aggregate Supply - Aggregate Demand Model

This model takes into account the fact that prices and wages are no longer fixed, as in the simple Keynesian model and in the Mundell-Fleming model. In effect, it makes the economy relatively more competitive through a decline in both the real wage and the price of domestic relative to foreign goods. Starting with a situation of trade balance and full employment, the impact effect of a devaluation will be to switch demand toward domestic goods; aggregate demand, income, and price level will all increase and the trade balance will improve. Over time, surpluses will cause the money supply and,



thus, aggregate demand to increase. At the same time, since the economy has moved above full employment, nominal wage will rise as labor contracts are revised and domestic real wages increase to their predevaluation level, causing the aggregate supply to decrease. These adjustments in both aggregate demand and aggregate supply will continue until the economy reaches a long-run equilibrium where output is back to its initial level, trade surplus has disappeared, the price level is even higher so that purchasing power parity (PPP) holds in the sense that the exchange rate and the price level change by the same proportion, and reserves have increased by an amount equal to the increase in the money supply.

Note that since devaluation could be inflationary, it should be combined with contractionary policies to maintain aggregate demand more or less unchanged. An adequate devaluation-cum-contractionary demand policy could move the economy to balanced payments without sharp deflationary (inflationary) effects. This implies that devaluation should be combined with other policy measures as a package.

## 2.4. The Monetary Approach

### 2.4.1. A Monetary Model with Traded Goods

A more recent approach to devaluation is the monetary approach (see Frenkel and Johnson 1976). This approach assumes full employment, price flexibility and one composite good. Unlike the Keynesian model, this approach abstracts from substitution effect that may arise from a change in the terms of trade and focuses instead on the supply of and demand for money. This approach views excess demand for goods, which results in a deficit, as a reflection of an excess supply of money. It also views devaluation as primarily a monetary phenomenon that operates via the real balance effect on

absorption. Thus, in this approach, real balance effects constitute the main channel through which a devaluation affects the real sector of the economy.

In the context of a simple monetary model, Dornbusch (1973a) has shown that a devaluation will improve the current account balance even if it has no influence on the real exchange rate (i.e., no expenditure switching effect). Specifically, a devaluation in a small economy will increase the price of traded goods by the full percentage of the devaluation. Since the price of traded goods enters into the price level, the price level will also increase, causing real money balances to decrease. Domestic residents will reduce spending below income so as to accumulate money balances with which to replenish their reduced real money balances. As a result, there will be an excess flow demand for cash balances that is matched by an excess flow supply of real goods, implying that the immediate effect of devaluation is to create trade surplus given the initial money supply. However, the increase in money supply implicit in surplus will reduce the incentive for hoarding (flow demand for money or excess supply of goods in nominal terms) and cause the economy in the long-run to return to full equilibrium with all real variables remaining unchanged. Thus, devaluation will improve trade balance only temporarily; once individuals have acquired desired money balances, trade surplus vanishes. The long-run effects will be to increase the domestic price level and the money supply by the same proportion, leaving real money balances unchanged. Reserves will increase as a result of temporary surplus arising during the adjustment process and will cause the money supply to rise in proportion to the exchange rate. It follows therefore that if devaluation is accompanied by equiproportionate increase in the money supply, there will be no net effect on real variables.



In sum, the effects of devaluation are as follows: (1) relative prices will not be affected because under PPP a nominal devaluation has a one-to-one effect on domestic prices; however, the terms of trade will remain the same because devaluation increases the prices of exports and imports by the same proportion; (2) a real balance effect will be generated by devaluation that will result in a temporary improvement in the trade balance; this is one of the outcomes of the monetary approach, that devaluation can affect the trade balance without changing the relative price or the terms of trade; and, (3) output will not be affected either in the short-run or in the long-run since it is exogenous at full employment.

In another version of this approach, money and bonds are the assets so that real wealth rather than real money balances alone drives the accumulation process. In this model, Marston (1985) assumes that aggregate supply is a function of the terms of trade so that a devaluation affects both aggregate demand and aggregate supply. As in the Keynesian model, a devaluation will lead to an increase in aggregate demand. However, the initial increase will be less than proportional to devaluation since the elasticity of expenditure with respect to real wealth is positive and since devaluation will reduce the real value of domestic wealth because domestic money and bonds are fixed in nominal value. On the other hand, aggregate supply will decrease because of the increase in nominal wages induced by higher domestic price for foreign good. The decrease in the aggregate supply will be proportional because equal increases in the exchange rate and the price level will raise wages proportionally and will leave output unchanged. Given a proportional decrease in aggregate supply and a less than proportional increase in aggregate demand, income will actually decline and the price level will rise less than proportionately in response to the devaluation. Thus, with devaluation

affecting real wealth because assets are fixed in nominal value, there will be real effects despite the flexibility of wages, a familiar result in classical models. The fall in output and the terms of trade will generate a surplus, causing a flow increase in wealth that will move the economy continuously toward a long-run equilibrium where the trade account reaches equilibrium with nominal assets increasing proportionally to devaluation. Wages and prices will also increase proportionally in the long-run so that output returns to its initial level. This wealth accumulation process will end when money balances as well as other assets have increased in proportion to devaluation.

Note that regardless of the presence or absence of wealth effects, wage-price flexibility plays a vital role. The Keynesian model predicts that a devaluation will raise income and improve trade balance while Marston's classical model predicts that its main if not exclusive effect will be on the domestic price level. When the trade balance improves because of the wealth effects, moreover, Marston's classical model predicts a decline in output rather than the expansion associated with Keynesian models.

The description of how an economy responds to a devaluation under the monetary approach differs markedly from those under the elasticities and absorption approaches because dynamic adjustment process is central to the monetary approach. In the elasticities approach, a devaluation improves the trade balance by changing the relative prices of imports and exports, but in the monetary approach there is only one traded good. In the absorption approach, a devaluation works by increasing output relative to spending, but in the monetary approach output is fixed at full employment. PPP combined with wage flexibility shuts off both of these traditional channels so that devaluation must work through wealth effects alone.

Nevertheless, the monetary approach is consistent with the elasticities and absorption approaches since the balance of payments equals trade balance plus capital account, where trade balance equals income less absorption while the capital account reflects the difference between change in real money demand and change in real domestic credit. Furthermore, the monetary approach can also be shown as a special case of the absorption approach. Given that absorption equals income plus dishoarding where dishoarding is proportional to the difference between money supply and money demand and that the quantity theory of money holds, then given real income, real absorption will decline iff real money balances decline after devaluation. With the money supply fixed, this implies that the price level increases.

On the other hand, according to Cooper (1971), it might be tempting to think of these approaches in temporal sequence, with the elasticities, absorption and monetary approaches representing the short-run, the medium run, and the long-run, respectively; he argues that such is an oversimplification because all factors are present to some degree even immediately following devaluation. However, Milani (1989) shows that the elasticities and monetary approaches to balance of payments are complementary theories; he shows that devaluation consistently leads to a temporary surplus in the balance of payments and a stable long-run equilibrium iff the Marshall-Lerner condition is satisfied; thus, the short-run effects of devaluation are those produced by the elasticities approach and the long-run effects are those implied by the monetary approach.

#### 2.4.2. A Monetary Model with Traded and Nontraded Goods

This model emphasizes the effects of changes in absorption on relative prices rather than the income effect of changes in the relative price of traded goods. In this model, it is assumed that there are two goods, traded

and nontraded, and the relative price is not the terms of trade between exports and imports but between traded and nontraded goods.

Dornbusch (1973b) has shown that the conclusion of the one commodity model continues to hold for the effects of a devaluation on the trade balance and the price of traded goods; the additional element that arises is that the reduction in absorption will cause the relative price of nontraded goods to fall. Specifically, a devaluation, by increasing the domestic currency price of traded goods, will increase the price level, thereby reducing real money balances at a given level of the money supply. Individuals will reduce spending in order to restore the real value of money balances, causing the relative price of nontraded goods to fall which in turn has two effects, both of which improve the trade balance: switch in domestic consumption from traded goods like imports toward the now relatively cheaper nontraded goods and away and shift in production toward the now relatively more profitable traded goods like exports and import competing products. The implication is that devaluation can affect the trade balance even if it cannot influence the terms of trade. Short-run equilibrium obtains where there is trade surplus, nominal income is higher but spending remains the same. This influence of devaluation on trade balance is only temporary. Over time, the decline in real money balances will be eliminated through hoarding and adjustments will continue until real money balances are back to their levels, inducing the relative price of nontraded good to also go back its level. Reserves will increase and thus the price of nontraded will also increase until long-run equilibrium is reached where the price of nontraded goods and the money supply are both higher.

Thus, in addition to the trade balance effect, there is the additional effect on relative price of nontraded goods. This additional effect of

devaluation results from its expenditure-reducing effects and from the decrease in the relative price of nontraded goods, an effect not discussed before. This means that the existence of nontraded goods reinforces the positive effect of the terms of trade on the trade balance.

### 2.5. A (Keynesian-monetarist) Synthesis Approach

The simple Keynesian model and the monetary approach provide two extremes with regard to the role of devaluation in the adjustment process. A more relevant approach is a synthesis approach which combines characteristics of both. In a version of this approach, the following are assumed: imported intermediate inputs, sticky wages and prices in the short-run, imperfect substitution between domestic and foreign assets, absence of PPP relation in the short-run, upward sloping aggregate supply curve, and an equilibrium real exchange rate that responds to a series of real fundamental determinants. Here, the effects of devaluation depend to a large extent on the initial state of the economy and on the accompanying macroeconomic policies; specifically, the effects are: (1) relative prices will be affected in the short-run; real exchange rate may also be affected in the medium- to the long-run if initial condition is one of real exchange rate misalignment; (2) trade balance will improve if devaluation affects real exchange rate and, in particular, if prices are slow to adjust and the real exchange rate is misaligned, a devaluation that is supplemented by appropriate policies will result in a real devaluation; and, (3) aggregate output may either increase or decrease because the increase in the relative price of the intermediate input will tend to reduce output and employment.

### 2.6. The New Classical Approach: Rational Expectations

The devaluation literature discussed so far has two restrictive assumptions: perfect certainty and static expectations. Turnovsky (1981)



analyzes the effects of exchange rate change in a stochastic model in which domestic agents form expectations rationally. He shows that in the long-run the exchange rate and the domestic price level change by the same proportion and output remains the same; however, in the short-run, the qualitative effects of a devaluation depend upon the accuracy of expectations.

**Preannounced Devaluation.** This is the case where devaluation is correctly anticipated before it actually occurs. Once devaluation is announced and since in the long-run devaluation will lead to an equiproportional rate of increase in the domestic price level, people will expect the domestic price level and inflation to rise by the same proportion as the devaluation after the latter occurs. Investment will remain the same since domestic real interest rate will remain the same (because expected devaluation will induce an increase in domestic interest rate to compensate investors in domestic assets from losses due to announced devaluation); trade balance will also remain unchanged since the domestic price level and the exchange rate have not changed; consequently, aggregate demand will remain unchanged. Since devaluation is not yet in effect, the domestic price level will remain the same and will be expected to remain so during predevaluation period; this means actual and expected price level will be the same and hence aggregate supply will also remain the same. Thus, the equilibrium will be the same as before and the immediate effects of preannounced devaluation will only be to lead to some capital flows, losses of reserves, increase in domestic interest rate, and bargaining over wage adjustment. After devaluation is undertaken, the domestic price level will increase in proportion; aggregate demand will increase because of devaluation; aggregate supply will decrease since the bargained wage increases obtained by workers during transition would be in effect; hence, output, employment, real interest rate and real wages

will all be unaffected. Thus, a preannounced devaluation, which is a case of a correctly anticipated devaluation, will to an exactly proportionate increase in the price level (due to exactly proportionate increase in aggregate demand and decrease in aggregate supply) and will not have real effects under rational expectations even in the short-run.

**Unrealized Devaluation.** In this case, devaluation is anticipated but the government decides not to devalue; thus, devaluation is expected but unfulfilled. During transition or the period preceding the point in time at which a devaluation is expected to occur, the economy will behave like it would under a preannounced devaluation: workers will rationally expect prices to increase proportionally to the devaluation and will bargain for cost of living increase to be in effect the moment the devaluation is expected to occur; nominal interest rate will increase and reserves will decrease. However, at that moment when the government is expected to devalue but decides not to do so, the following will happen: real wage will increase (since labor contracts are already drawn with corresponding cost of living clauses embodied in them), causing labor costs to increase and aggregate supply to decrease; inflationary pressures will arise even if actual devaluation has not occurred (specifically, if people retain their expectation that devaluation will occur, they will continue to believe that there will be inflation) but given that prices are already increasing, they will rationally expect the devaluation to generate a less than proportionate increase in prices when it occurs (i.e., the expected rate of devaluation will exceed the expected rate of inflation), causing an increase in the real interest rate that will reduce investment and hence aggregate demand. Thus, in the short-run an expected but unfulfilled devaluation, which is a case of an overpredicted devaluation, will lead to a more than proportionate increase in the price level (i.e., short-run

overshooting of the price level relative to its long-run proportionate change, equal to the actual rate of devaluation which is zero) and perverse contractionary effects on output (because of decrease in both aggregate demand and aggregate supply); hence, it is stagflationary. An important policy conclusion is that if a government is contemplating a devaluation, it should not give any indication of this to the public if it wishes to avoid the contraction in domestic activity and the overresponse of the price level. If individuals will hold on to their expectations and the government will keep finding ways of avoiding devaluation, that short-run equilibrium will be sustained. However, in the long-run, either the government will run out of means to support exchange rate or individuals will reverse their expectations; the economy would then return to full employment where the price level and output are the same as before.

**Unanticipated Devaluation.** In the short-run, a completely unanticipated devaluation will increase aggregate demand and hence output and employment. However, it will generate inflation although, initially, the rise in domestic prices is less than proportional to the devaluation. Note that the source of the short-run output increase is the unanticipated price increase resulting from the unanticipated devaluation. Since the price increase will be unexpected, it will not be embodied in labor contracts; as a result, real wage will decrease and production will increase. Thus, in the short-run, an unanticipated devaluation, which is a case of underpredicted devaluation, will lead to a less than proportionate increase in price level (i.e., short-run undershooting of the price level relative to its long-run proportionate increase) and an expansion in income (because aggregate demand increases while aggregate supply remains unchanged). However, in the long-run, contracts will be revised to embody the expected price increase; inflationary expectations

will arise which will decrease aggregate supply and will induce a long-run equilibrium where the price level is even higher and has increased in proportion to devaluation but output is back to the full employment level.

In sum, under rational expectations, an unanticipated devaluation appears to be the best because it results in short-run increases in output whereas an unrealized (anticipated but delayed) devaluation is the worst because it is stagflationary. A preannounced devaluation, on the other hand, has no real effects even in the short-run. In all the three cases, the long-run consequence is to increase domestic prices proportionally to devaluation. The general conclusion is that the impact of exchange rate change on the economy depends critically upon the extent to which such change is predicted. This conclusion is consistent with the proposition of the rational expectations monetary stabilization literature, that only unanticipated monetary disturbances can have real effects.

## 2.7. The New Structuralist Approach

Devaluation can affect the real sector through number of channels. According to the traditional view, it will have an expansionary effect on aggregate output if there is unutilized capacity or, in the worst case, it will leave output unchanged if the economy is operating under full employment. This view has been challenged by the new structuralist approach (for instance, see Krugman and Taylor (1978) and van Wijnbergen (1986)). Contrary to the traditional view, there are several channels through which devaluation can be contractionary. As enumerated by Edwards (1989), the demand-related effects are as follows: (1) a devaluation will generate a negative real balance effect which will lower aggregate demand and, possibly, output; (2) a devaluation, instead of stimulating aggregate demand, can actually be contractionary if the resulting relative price change favors groups in the economy with low marginal



propensities to consume (Krugman and Taylor (1978)); and, (3) a devaluation may worsen the trade balance and, hence, reduce output if the price elasticities of imports and exports are sufficiently low. In addition to these demand-side channels, there are also supply-side channels through which devaluation can be contractionary; in particular, van Wijnbergen's (1986) discusses the following: (1) the effect on the local currency costs of imported intermediate inputs; (2) the negative effect on the volume of real credit to firms requiring funds; (3) the effect on external debt payments; and (4) the effect on nominal wages in the presence of wage indexing and food imports. The implication of this approach is that a devaluation can be contractionary even if the net effect on aggregate demand is expansionary (i.e., the expenditure-switching effect dominates the expenditure-reducing effect) provided that aggregate demand shifts by less than aggregate supply (Agenor, 1991, p. 20).

### 3. Concluding Remarks

This paper has reviewed the literature on the theory of devaluation. The various approaches to the analysis of devaluation that have been discussed are complementary and represent different views of the same phenomenon. However, there are also some issues on the effects and effectiveness of devaluation that must be taken into account.

One issue pertains to the distributional effects of devaluation. In particular, a devaluation will raise the price of traded - export and import-competing - goods. Because of the increase in the prices of these goods, the traded goods sector will expand production and will bid up the returns of factors used extensively in this sector. As a result, the rents of factors engaged in the traded goods sector will increase while the real income of other groups will decline.



Another issue relates to the pessimistic consequences of devaluation. Specifically, according to Cooper (1971), devaluation may appear as unattractive to policymakers because of the beliefs that devaluation will not improve the trade balance because elasticities are small, that it will worsen the terms of trade, that it will increase domestic prices and set in motion wage-price spiral which will undermine the initial improved competitiveness caused by devaluation, and that it will simply be politically unpalatable.

There are, however, some broad generalizations on the effectiveness of devaluation or exchange rate changes. Goldstein and Khan (1985) gives the following generalizations: (1) relative prices (real exchange rates) matter since evidence supports Harberger's statement that price mechanism works powerfully and pervasively in international trade; (2) the short-run effects of devaluation are not the same as the medium-run or the long-run effects so that a country may get deterioration in trade balance if trade volume response is low and domestic-currency import prices rise more rapidly than export prices and also if domestic price feedback effects appear before the resource allocation effects; (3) there are things that matter other than relative prices such as the relationship between exchange rate changes and current account imbalances (that may look weak in the long-run because of lack of supporting expenditure reducing policies, of longer term incentive patterns that favor expenditure over saving, of faster adjustment speeds in asset than in goods markets that cause devaluation to work via the capital rather than the current account, or of accompanying trade policies that swamp the goods-market effect of devaluation) and the consistency between exchange rate changes and the various adjustments/policies (stabilization policies, trade/financial liberalization, monetary and fiscal policy, interest rate targetting, trade policies); and, (4) different countries will be affected

differently by exchange rate changes because they differ in commodity composition, in degrees of export and import openness, in the degree of capacity utilization, in the degree of real wage resistance, and in the efficacy of monetary policy and fiscal policy.

Thus, in analyzing the effects of devaluation, one must use a combination of several approaches. In addition, one must take into account the issues pertaining to the distributional effects, the pessimistic consequences, and the effectiveness of devaluation.

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