



A REAL DEVALUATION AND EXPANSIONARY EFFECT ON THE ECONOMY

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Abstract

A real devaluation is achieved when an economy experiences a state in which the price of traded goods increases relatively to non-traded goods. For a long time, devaluation as an instrument to improve the trade balance has been debated extensively. Recently, the discussion has focused on the effects of devaluation on real output. The question whether a real devaluation, whether triumphantly in improving the trade balance or not, would have an expansionary effect on the economy has important implication for macroeconomic policies. Numerous studies have been taken place on the issue since Krugman and Taylor set off the debate in 1978. The results of these studies have been controversial. Under some certain circumstances, devaluation has expansionary effects on the economy whereas in the others, contractionary effects are proved to be more dominant.

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1. Effects on Aggregate Demand

A thorough and comprehensive work by Agenor and Montiel (1996) on the issue provides an extremely excellent analysis of devaluation effects on the economy from both demand and supply perspectives. The analysis will be taken under the assumption of a dependent economy where traded and non-traded goods are produced using homogeneous, inter-sectoral mobile labor; sector-specific capital; and imported inputs. The devaluation effect on aggregate demand and on aggregate supply will be examined separately using the framework and notations taken from Agenor and Montiel (1996) for the purpose of consistence and easy following.

Since the demand curve of traded goods sector in a small open economy follows the law of one price, $P_T = \bar{E}P_T^*$ (where, P_T^* taken to be unity is foreign-currency price of traded goods, \bar{E} is the exchange rate, and P_T is the domestic-currency price of traded goods), we will examine the effects of devaluation on each component of the aggregate real demand for non-traded goods, $d_N(t)$:

$$d_N(t) = c_N(t) + I_N(t) + g_N$$

where $c_N(t)$, $I_N(t)$, g_N are respectively domestic consumption, investment and government demands for non-traded goods.

Consumption

Agenor and Montiel show the consumption demand is the function of real exchange rate, $z_t = P_T(t)/P_N(t)$, where $P_N(t)$ is domestic currency price of non-traded goods; real income, y_t , less taxes, tax_t ; real interest rate, $i_t - \pi^e$, which is equal to the nominal interest rate, i_t , less the expected inflation rate, π^e ; household financial wealth, a_t ; and shift parameter, k , representing possible distribution effects as follows.

$$c_N(t) = c_N[z_t, y_t - tax_t, i_t - \pi^e, a_t, k]$$

The devaluation effect on $c_N(t)$ is the combined effects on each individual argument.

Relative price effects

A devaluation triggers off changes in relative prices that alter the demand for non-traded good. Although the domestic demand for traded good changes, the total domestic and foreign demand for such goods remains the same because the small open economy faces a perfectly elastic demand for traded goods. However, demand for non-traded goods faces a downward-slope curve and will, ceteris paribus, expand as real devaluation makes non-traded relatively cheaper. Thus, this shows the expansionary effect of devaluation and the partial derivative $\partial c_N(t)/\partial z_t > 0$.

Real Income Effects

By denoting δ , α , respectively as the share of traded goods in consumption and in total output, and $y_N(t)$, $y_T(t)$ respectively as the production of non-traded goods and traded goods, Agenor and Montiel(1996) show the derivative of real income, y_t ,

$$y_t = y_N(t)z_t^{1-\delta} + y_T(t)z_t^{1-\delta}$$

with respect to z_t is taken the form,

$$dy_t/dz_t = z_t^{-1}(\alpha - \delta)[y_N(t)z_t^{-\delta} + y_T(t)z_t^{1-\delta}]$$

The real income effects of devaluation are, therefore, equivocal depending on α and δ , say, expansionary effect will be captured if there is a trade surplus $\alpha - \delta > 0$, while contractionary effect will prevail where there is a deficit $\alpha - \delta < 0$.



Real income is also affected by the effects of imported inputs. Though the effects are ambiguous. It is more likely to be negative if the share of non-traded goods in the price index is high and the substitution elasticity between imported inputs and primary factors is low.

Effects Through Changes In Real Tax Revenue

Krugman and Taylor (1978) argue that a real devaluation will augment the real tax burden on the private sector through the increase in the real value of ad valorem trade taxes, given certain levels of imports and exports. Thus, income is redistributed from private to public sector and contractionary effect on $c_N(t)$ is obvious. Olivera (1967) and Tanzi (1969, 1977) shows that devaluation would induce an expansionary short-run effect on aggregate demand through a fall in taxes as a result of lags in tax collection or delays in nominal value adjustment of specific taxes. The effect of discretionary tax changes because of exchange rate adjustment on government finance would also affect aggregate demand. If governments are constrained to choose to increase the discretionary taxes, contractionary effect would happen and vice versa.

Effects Through Changes In Real Interest Rates

Consumption and investment spending on non-traded goods is expected to be reduced as real interest rates rise. Since real interest rates are net value of nominal interest rates and expected inflation rate, we will examine how a real devaluation affects nominal rates of interest, hence real interest rates by looking at the equilibrium condition in the loan market in case of imperfect substitutes between domestic loans and foreign assets:

$h(i_t, i^* + \epsilon^a, y_t, (M_t + \overline{EF}_t^P)/P_t; x_t) = 0$ and $i_t = i^* + \epsilon^a$ if imperfect substitutes, where $h()$ is the real excess demand function for loans, $i^* + \epsilon^a$ the nominal rate of return on foreign assets comprising foreign nominal interest rate and expected rate of devaluation, $M_t + \overline{EF}_t^P / P_t$ real household financial wealth, and x_t index of working capital requirement. The little sign above each term presents its relationship with $h()$.

A decrease in wealth through devaluation (shown below) would increase the loan excess demand, hence domestic interest rates, and vice versa in case of a previously unanticipated devaluation and imperfect substitutes. Whereas, in case of imperfect substitutes, a previously unanticipated current devaluation will not affect nominal interest rates at all. In developing countries, loan demand and therefore nominal interest rates usually depends on working capital requirement, ceteris paribus, influenced by cost of imported input which is higher in presence of real devaluation (Agénor, 1995b).

Wealth Effects

A change in wealth may result in positive change in aggregate demand since people tend to expand their consumption in line with their accumulation of wealth. The cash balance effect may sometimes exhibit a similar pattern to wealth effect as nominal stock of money are deemed to be the same as nominal wealth. A devaluation would raise the price level and curtail the real stock of money. Thus, absorption would be reduced, hence contractionary effects are created, because people tend to reduce their consumption to restore their desirable real money holdings or to switch their portfolios into money.

A devaluation may however increase nominal value of certain types of assets, say, foreign-currency-denominated assets F_t^P , that the private sector may hold. If the private sector hold portfolio only in terms of domestic money, devaluation will have a negative effect on real wealth and on demand. The effect is ambiguous if they hold F_t^P as well since price level increase make the real value of stock of domestic money decrease but the real value of stock of foreign assets amplifies if real devaluation is achieved (Lizondo and Montiel, 1989). The pattern of change in wealth depends on the arguments of following function, where \hat{a}_t , \hat{z}_t , λ , ϵ_t are respectively the percentage change of real wealth, the real depreciation, the share of domestic money in private sector and the devaluation rate:

$$\hat{a}_t = (1 - \delta) \hat{z}_t - \lambda \epsilon_t$$

Income Redistribution Effects

Because of lags in wage adjustment, devaluation would switch wages into profits. As a result, contractionary effect would play its role because wage earners more often than not have higher propensities to consume than profit recipients. However, the expansionary effect does exist since these profits would turn into investments as the latter have higher propensities to save than the former. The effect of redistribution from private to public sector through the unchanged structure of taxation has been discussed previously.

It is worth noting that redistribution effect would result from the fact that a real devaluation will increase real payments to factors intensively employed in the traded goods sector while decrease real payments to the other factors.



Investment

Another source that affects aggregate demand in the presence of real devaluation is demand for investment. Devaluation can alter investment in three ways: effects on real cost of capital, the product wage and the cost of imported inputs. Capital goods are often imported in developing countries. Therefore, an increase in price of capital goods would be obviously observed in the presence of real devaluation and induce decline in investment; hence aggregate demand. However, this effect is indeterminate since in the traded goods sector, it seems to be in favour of investment as a real devaluation tends to relatively reduce cost of capital in comparison with outputs.

Investment demand, *ceteris paribus*, depends on product wage which may be influenced by devaluation. Expansionary effects through investment expansion caused by devaluation would result from a fall in product wage in case of rigid nominal wages, whereas contractionary effects prevail in case of indexation wage. Lizondo and Montiel (1989) suggests that a devaluation tends to make product wage increase in the non-traded goods sector while decrease in traded goods sector in a dependent economy with some nominal wage flexibility. Hence, a vague effect of devaluation is usually observed.

Finally, a real devaluation clearly rises real cost of imported inputs that negatively affect the marginal product of capital in the non-traded goods sector. Thus, non-traded goods sector experience a shrink in investment.

To sum up, these three effects of devaluation tend to expand investment in traded goods sector and curtail investment in non traded goods sector.

Government Expenditure

The effect of government expenditure is somewhat similar to the effect of taxes since they are source of government expenditure. Any expansionary effect by government expenditure on aggregate demand may be wiped out by the contractionary effect of taxation. A real devaluation would boost the real value of interest payment that is incurred by the government if the public sector is a net external debtor. Government expenditure on goods and services is also influenced by a real devaluation. If government spending on traded goods is dominant, the total value of spending would grow since devaluation trigger off an increase in real value of traded goods and a decrease in real value of non-traded goods.

2. Effects on Aggregate Supply

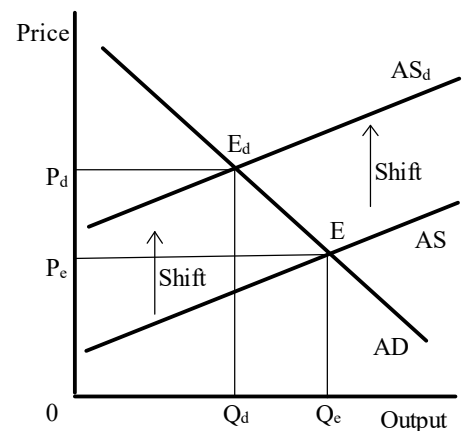
Having examined devaluation effects on aggregate demand, we now move on to effects on the other side of the economy, aggregate supply. Devaluation would enlarge the nominal wages, increase cost of imported inputs, and raise the cost of working capital which are sources causing an upward shift in supply curve. Therefore, outputs decreases and contractionary effects prevail. The effect is illustrated by the next figure. Devaluation boosts the prices of factors of production that make the aggregate supply AS shift upwards to AS_d . New equilibrium condition E_d reduces the output Q_e to Q_d . Since the effects of devaluation on nominal wages, imported inputs, and working capital have been somewhat mentioned during the analysis of devaluation effects on aggregate demand. This subsection will only be presented briefly.

Effects through the Nominal Wage

Agenor (1995) show that the extent to which a nominal depreciation translates into a real depreciation determines decisively its effects on the nominal wage. Without indexation, the effect of unanticipated devaluation on nominal wage is greater than that of anticipated one. However, it does not always necessarily mean that devaluation implies higher level of nominal wage. If there exist a large labour share, an intensive use of imported inputs, and small elasticity of substitution of labour for imported inputs in non-traded goods sector, a real devaluation will reduce the demand for labour. That tends to shrink the increase, caused by devaluation, in nominal wage; hence the contractionary effect of devaluation on aggregate supply will be offset to some extent. In fact, the product wage will decrease in the traded goods sector and rise in the non-traded goods sector provided that a nominal devaluation is not translated totally into a real depreciation.

Effects Through Imported Inputs

A shift in aggregate supply curve results from the increase in costs of production of domestically produced goods is partly due to the higher price of imported inputs in the presence of devaluation. The extent to which the costs increase depends on technological factors and changes of price of other factors of production in the existence of devaluation. We will examine the devaluation effects on supply of non-traded good in relation with nominal wages. The supply of traded good is not affected since the price of inputs changes in line with output price.



An upward shift in the supply curve AS caused by a real devaluation exhibits contractionary effects



In the presence of devaluation, if wages increase by the full amount of devaluation, the same amount will be added to the return to capital. However, at the initial rate of return of capital, there is a tendency to substitute value added for imported inputs, and capital for labour. Since the amount of capital is constant, its rate of returns augments as long as the initial ratio of nominal wages to the rate of return to capital is restored and the same combination of inputs is used to produce the certain level of output. If wages increase by less than the full amount of devaluation, the rate of return to capital will increase by more than nominal wages. An upward shift in supply curve by the same percentage as the exchange rate will be observed if wages increase by the full amount of the devaluation, and a shift less than exchange rate but higher than increase in wages will be observed in case wages do not increase by fully amount of the devaluation. In such cases, the larger share of imported inputs in total costs induces larger increase in supply price. The elasticity of substitution between imported inputs and value added also negatively affect the supply price.

Effects Through Costs of Working Capital

The contractionary effect of devaluation also works through increasing the cost of working capital to finance labour costs and imported inputs. The cost of working capital expands because the interest rates increase and the supply curve shifts upwards as a result of devaluation. The finance of working capital in the presence of devaluation also influences the elasticity of the sectoral short-run supply curves.

Besides, the working capital costs tend to curtail short-run supply elasticity's in both traded and non traded sector since the marginal costs increase as financial requirements for additional working capital increase. In the event of a real devaluation, the decrease in supply elasticities induces harmful effect in terms of economic expansion in the traded goods sector. However, the effect is ambiguous in non-traded goods sector depending on the response of demand for that goods in the presence of devaluation.

Conclusion

The devaluation as an effective instrument for short-run balance-of-payment adjustment is often necessary during economic history of countries since it encourages the reallocation of resources from non-traded goods sector to traded goods sector that improve the short-run competitiveness of traded goods of a country. However, the question of whether a devaluation has an expansionary effect on the economy is controversial. The effects have been represented to be either expansionary or contractionary with a tendency towards contractionary in this essay. Agenor and Montiel (1996) also collect numerous empirical works. Though, these works sometimes commit serious methodological problems, they provide certain evidence of the effect of devaluation in the real world.

The ambiguous effect of a real devaluation suggests that they should be taken into account carefully when using exchange rates as a policy instrument. A comprehensive understanding of sources of these effects provided by Agenor (1994, 1995) and Agenor and Montiel (1996) is obviously useful for policy-makers to think about when making decisions. Ignoring to analyze all possible effects when making a devaluation decision would result in serious consequence and negative impact on the economic growth and development.

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