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STABILIZATION IN LATIN AMERICA: POPULAR MODELS AND UNHAPPY EXPERIENCES

by

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Stabilization in Latin America:

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1. Introduction

This paper surveys popular models of economic stabilization in developing countries, used over the past three decades. Much of the thought and experience during the 50's and 60's relied on Meade (1951), Fleming (1962) and Mundell (1968). A model of internal and external balance is described in the second section and then used to discuss the implications of orthodox programmes. The experience during the 70's diverge from earlier ones because of the greater importance of capital movements. A model based on Dornbusch (1980, 1982) and Rodriguez (1982) is presented in the third section. A discussion of recent programmes then follows.

The recessions induced by high real interest rates in Latin America makes one suspicious of the "repressed" economy models. The fourth section briefly discusses their theoretical and empirical problems.

A survey of popular stabilization models in Latin America is not complete before references to the structuralist school are made. They close the paper.

2. The ageless orthodoxy

The models made popular in the 60's emphasize competitiveness, inflation and budget deficits. Examining internal and external balance, they focus our attention on three variables[1] : the real wage rate, w-e, the real money stock, h-e, and the share of the budget deficit in full employment output, f. Demand for output is assumed to depend positively on the budget deficit and on real cash balances, and inversely on the real wage, since an increase in real wages reduces our competitiveness abroad and diverts demand from domestic goods towards foreign goods. Given the budget dificit, combinations of the real wage and of the real money stock such that demand for output equals its potential level can be represented by an upward sloping schedule like y=0 in[2] figure 1:

$$y(w-e,\ h-e,\ f) = 0 \qquad (1)$$

One can immediately verify that points to the left of y=0 represent situations of unemployment.

We show external equilibrium in figure 1 along the schedule B=0, having assumed that the current account improves with reductions of either the real wage, or the real cash balances, or the fiscal deficit:

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[1] The real wage is defined as $w-e \equiv \log(P/EP^*)$. The price of domestic goods is assumed to be equal to the wage rate, W, and foreign prices $P^*=1$. Small letters represent logs. Along the same lines, the real money stock is $h-e \equiv \log(H/EP^*)$. The use of foreign goods as our numeraire makes the algebra simple. Results can be easily extended to more complicated specifications, as pointed out in footnote 4.

[2] The output gap is defined as $y \equiv \log(Y/\bar{Y})$, where Y and $\bar{Y}$ represent respectively current and potential output.

(2) $B(w-e, h-e, f) = 0$

Points to the right of the schedule B=0 represent current account deficits and points to the left, current account surpluses. At point E, the economy enjoys full employment and current account equilibrium, while its private sector pays the inflation tax. We call π the steady state or trend inflation, and v the ratio of potential output to the real money stock. Thus we can write:

(3) $\pi = vf$

Point A in figure 1 represents an economy suffering from unemployment and a current account deficit. To know if it can rest there or is moving somewhere else we need to find out the dynamics that determine the real wage rate and the real money stock. Changes in the nominal money stock are determined by the budget deficit and by changes in the foreign reserves. Defining the share of the current account surplus in full employment output as b, we can write[3]:

(4) $\dot{h} = v(f+b)$

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[3] To arrive at equation (4), write down the expression for changes in the money stock: $\dot{H}=EP^*$(budget deficit+current account surplus). Divide both sides of this equation by H. Then divide and multiply the right hand side by $\bar{Y}$. Having defined the shares of the budget deficit and of the current account surplus respectively as f and b, we come to: $\dot{h} = (f+b)(\bar{Y}/(H/EP^*))$. One should further observe that the real money stock, H/EP^*, equals its demand, $L(Y,\dot{w},\dot{e})$, and thus: $\dot{h} = (f+b)v(Y,\dot{w},\dot{e})$. In what follows we assume velocity to be constant. Footnote 4 points out that the model can be extended to include a variable velocity term. Since our results are not reversed by the realistic specification, we procede under the simplistic assumption that velocity is constant.

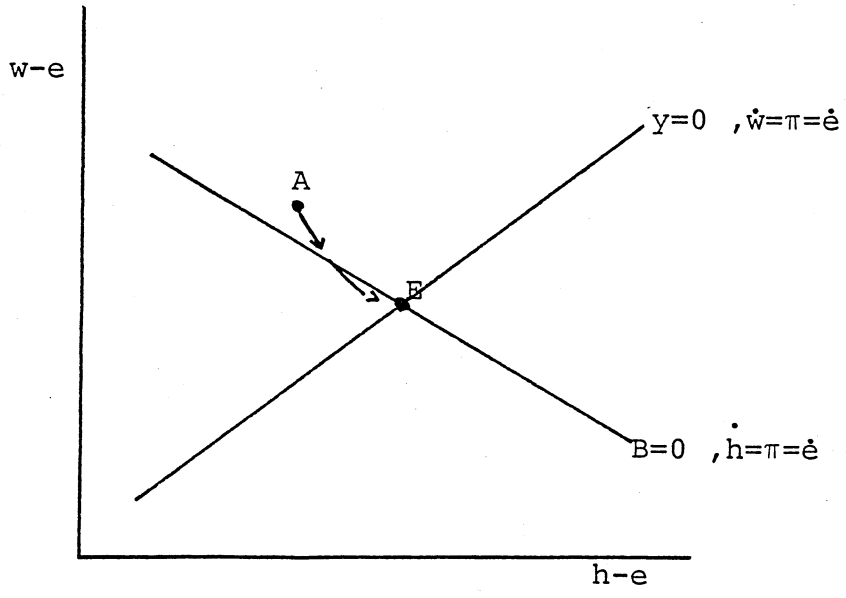

Figure 1

The wage inflation rate exceeds trend inflation whenever demand for output exceeds its full employment level:

(5) $\dot{w} = \pi + ay$

To determine the behavior of the real wage rate and of the real money stock, we make explicit the government choice for the nominal exchange rate. We will make different assumptions. The assumption consistent with steady state equilibrium of zero unemployment and balanced current account is that $\dot{e} = \pi$. In that case, the real wage rate is constant along the y=0 schedule, and the real money stock is constant[4] along B=0. Our economy could not rest at point A, but would be travelling in the direction of happiness described by point E. Before we move on to a new exercise, it is worth noting that along B=0, the budget deficit is entirely financed by the inflation tax, i.e., by forced domestic savings. To the right of the B=0 schedule, the budget is financed in part by the inflation tax, in part by foreign savings, i.e., by current account deficits.

As opposed to the previous story, if the exchange rate is kept fixed, $\dot{e}=0$, the real money stock would be constant, $\dot{h} = 0$, only if the budget deficit is entirely financed by a current account deficit. We represent this situation by a dashed schedule in figure 2. On the other hand, the real wage rate would be constant if the unemployment rate is high enough, so that cyclical deflation exactly compensates for trend inflation. This would happen along the schedule $\dot{w} = 0$, in figure 2. At point A, although there is unemploy-

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[4] Here we indicate how to extend the model by relaxing the hypothesis that velocity is constant and by correctly deflating the money stock by the cost of living index, which is a weighted average of domestic and foreign prices. Its inflation rate is defined as $\dot{q} = c\dot{w} + (1-c)\dot{e}$. The real money stock is constant as long as: $\dot{h} - \dot{q} = v(Y,\dot{w},\dot{e})\ (f+b) - c\dot{w} - (1-c)\dot{e} = 0$. This equation can be represented by a schedule passing through point E and crossing the upward section of figure 1, where there is unemployment and current account deficits.

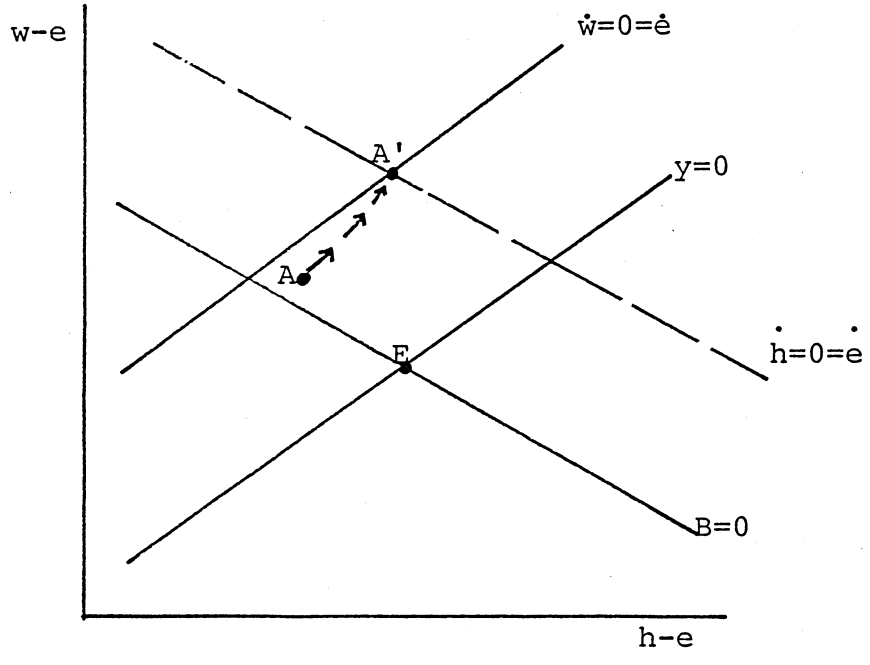

Figure 2

ment, and wage inflation falls below its trend level, it is positive, thus exceeding the zero devaluation rate: the real wage is increasing. It is also the case that the budget deficit exceeds the current account deficit and so the money stock is increasing. It follows that we are moving from A upwards in the direction of A', as indicated by the arrows in figure 2. Along the path AA', there is inflation and overvaluation, unemployment and a current account deficit. At A' the situation is so bad that the government devalues. The economy jumps back to A, with a temporary relief in its external account and prepared to start again its travel along the sad path AA', with its never ending problems of inflation, unemployment and increasing foreign debt.

The ageless orthodox medicine consists of two basic ingredients: a devaluation which drastically reduces the real wage and the elimination of the budget deficit, which makes possible steady state equilibrium with zero inflation rate. Depending on the size of the devaluation, the travel in the direction of a new equilibrium includes unemployment along the way. For most countries, the large cut in real wages is the most difficult medicine to swallow.

During the late 50's Latin America suffered from the application of numerous orthodox programmes: Chile (1956-58), Argentina (1959-62), Bolivia (1956), Peru (1959) and Uruguay (1959-62). The results have been judged to be appalling. Although the inflation rate declined for a short period, unemployment increased and the share of wage earners in output fell.

The Brazilian experience in the mid-sixties is often cited as a successful example of the program. Following several years of stagnation, high inflation and political unrest, the military coup of 1964 set a period

of rigorous stabilization followed by years of prosperity. In the first period of the program, the budget deficit was drastically curtailed, by increasing taxes and reducing current government expenditures and at the same time expanding public investment. The exchange rate was devalued and restrictions on money wage increases were imposed as part of the program. As a result, the inflation rate fell to some 20% per year, which is modest by Brazilian and Latin American standards. Real growth at first fell, but after 1967 until 1973 it was kept around 10% per year, combined with a strong external position. The costs were not minor for the group who paid the bill. As Fishlow (1973), Macedo (1977) and Foxley (1981) show, real wages did fall during the stabilization program, with bad effects for income distribution, only made possible by massive political repression.

There are other difficulties that one should be aware of. If nominal wages are indexed to past inflation rates, while the nominal exchange rate is kept fixed, rather than travelling directly to the new equilibrium, with lower real wages, we first take a detour up that could lead into a balance of payments crisis. In the Brazilian case, around 1968, policy makers realized that inflation was not about to disappear. To keep real wages at competitive levels, real appreciation ofthe exchange rate had to be avoided, which implied the adoption of a crawling peg. Chilean and Argentinian policy makers in the late 70's didn't do the same and the results were the dramatic real appreciation of their currencies. We will discuss Chilean problems in the next section.

In the meantime, there are important lessons to be derived from the model in this section and its malpractice. The first one is that the stabilization program has to be paid for. One must pay attention to the

fact that, in the presence of real wage resistance, if prices are cost determined, and mark-ups do not move, the cut in the budget deficit and in domestic credit creation, only induces more unemployment. As long as unemployment persists, the current account looks better, but its situation is not promising, since no structural change has taken place. We will return to this point in the last section.

3. Capital Mobility

Stabilization programs in the 70's have increasingly recognized the importance of capital mobility in the adjustment process. Since this problem turns around interest rates, the model in this section moves the analysis from real cash balances to the real interest rate, r, and accordingly modify equation (1). Demand for output is assumed to depend positively on the budget deficit and inversely on the real wage and on real interest rates, since an increase in the interest rate increases the opportunity cost of investment and reduces aggregate demand. Given the budget deficit, combinations of the real wage rate and the real interest rate such that demand for output equals its potential level can be represented by a downward sloping schedule like y=0 in figure 3:

$$y(w-e,\ r,\ f) = 0 \tag{6}$$

Points to the right of y=0 in figure 3 represent situations of unemployment.

We now look at interest rates determination. Perfect capital mobility implies that our nominal interest rate, i, equals the foreign interest rate, i^*, adjusted for expected depreciation[5] :

$$i = i^* + \dot{e} \tag{7}$$

We define the real interest rate as the difference between the nominal interest rate and the rate of inflation of the cost of living, $\dot{q}$, which is an weighted average of the inflation rates of domestic and imported goods: $\dot{q} = c\dot{w} + (1-c)\dot{e}$.

$$r = i - (c\dot{w} + (1-c)\dot{e}) \tag{8}$$

Substitution of (8) into (7), given the assumption of zero foreign inflation, yields:

$$r = r^* + c(\dot{e} - \dot{w}) \tag{9}$$

Equation (9) mean that our real interest rate, adjusted for expected real apreciation equals foreign real interest rate.

We maintain the assumption that the wage inflation rate exceeds trend inflation whenever demand for output exceeds its full employment level (equation (5)).

As in the previous section, we will make different assumptions about the government choice for the exchange rate behavior. We start with the assumption consistent with steady state full employment equilibrium, i.e., $\dot{e} = \pi$. As before, if the depreciation rate equals trend inflation, real wages will be constant along the y=0 schedule.

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[5]The framework of analysis is one of perfect foresight with respect to interest rates, inflation and depreciation.

We also want to represent assets market equilibrium in figure 3. This is done by substituting the devaluation rate, π, together with the wage inflation rate into (9):

$$r = r^{*} + cy(w-e,r,f) \tag{10}$$

Equation (10) is represented by the schedule RR in figure 3. At point E, there is full employment, both the wage inflation and the depreciation rate equal trend inflation, and the domestic real interest rate equals the foreign one. At point A, in figure 3, there is unemployment and the wage inflation rate falls below trend inflation. There is real depreciation, and people only hold the stock of domestic bonds because it pays an interest rate higher than the foreign one. As the real wage falls, expected depreciation and domestic interest rates are reduced, and the economy travels in the direction of E.

For the moment, imagine that the economy is travelling from A in direction to E, and that the policy makers fix the exchange rate, making $\dot{e} = 0$.

As shown in figure 4, once the nominal interest rate is fixed, the real wage rate is constant only if the unemployment rate is high enough, so that the cyclical deflation exactly compensates for trend inflation. This would happen along the schedule $\dot{w}=0$. On the other hand, the schedule representing assets market equilibrium shifts to the left, since domestic interest rates will only equal foreign ones when expected real depreciation is zero, which will now occur at point E'. As shown in figure 4, point A does no longer represent an equilibrium in the assets market. Since there is inflation, and the government has fixed the exchange rate, people now

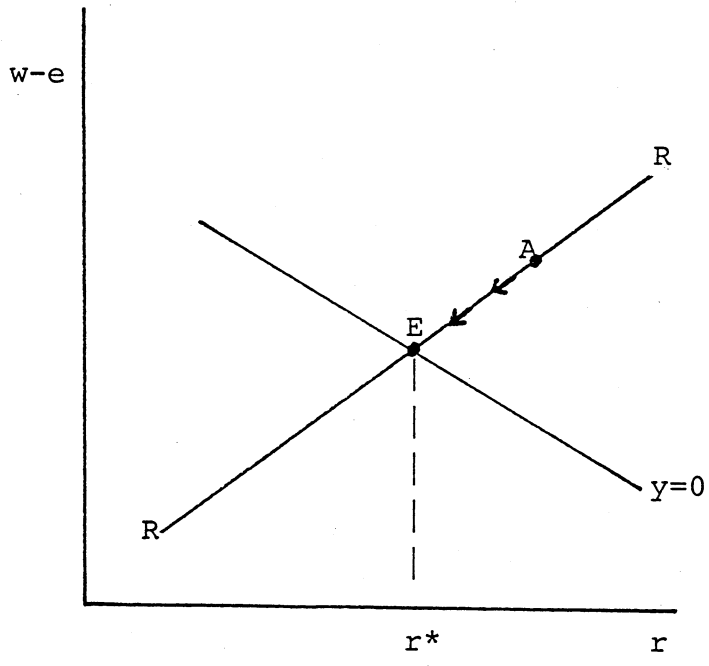

Figure 3

expect real appreciation and domestic interest rates fall. In figure 4, the economy jumps from A to A', and then, to E', as the real exchange rate appreciates domestic and real interest rates increase. The economy moves from A' to E', with falling inflation rates, but overvaluation. Consequently, unemployment increases and the current account deteriorates. When the economy reaches its zero inflation rate, the situation looks as dismal as the scientists responsible for the trick.

The movements of the real interest rate and the real wage rate described by the jump from A to A' and then by the movement in the direction of E' resembles the data for the same variables in Chile, between 1979 and 1981. Starting in 1965, the exchange rate regime in Chile has been one of minidevaluations designed to avoid abrupt changes of the real exchange rate, characteristic of periods when governments pursue inflationary finance. From 1978 until June 1979, Chile followed a tabular exchange rate regime. On June 30, 1979, the progression of the exchange rate table then in effect was interrupted and a fixed rate system was established.[6] As the model predicts, and Table 1 shows, the real interest rate falls in the second half of 1979 and then increases together with real wages. At the same time, unemployment increases and the current account deteriorates, while inflation converges to the international level.

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[6]Rather than fixing the exchange rate at the previous level, the policy makers devalued to 39 pesos to the dollar and fixed at that level, at the same time as tariff rates were unified at 10 percent. The final effect was not a real devaluation. For a short but thorough history of trade and exchange rate policy in Chile, see Harberger (1982).

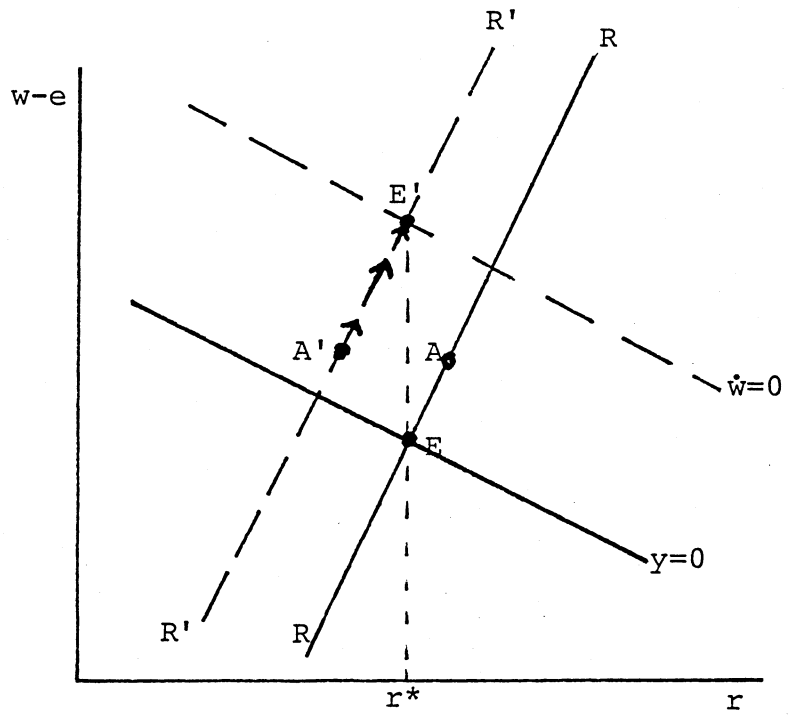

Figure 4

Table 1.

Real interest rates and Real wage rates in Chile

	1978	1979		1980	1981
		1st	2nd		
Real interest rates					
% per month	2.99	1.79	0.83	1.05	2.75
Index of real wages 1970 = 1	1.01	1.12		1.21	1.33 (June 1981)
(Univ. of Chile corrected CPI Deflator)					

Source: Real interest rates are interest rates rates charged for short term loans, Banco Central do Chile, Boletin Mensual, Julio 1982, p. 530. Real wage rates are from Harberger (1982), Table 6. The index for the real wage rate is .66 in 1975. Whatever the data used to calculate the real exchange rates in this period, one finds a clear real appreciation.

The recent stabilization program in Chile (1978-81) diverge from the previous ones by the fact that the dominant orthodoxy became the global monetarism of Johnson and Mundell, in which a fixed exchange rate is seen as the basic determinant of inflation, while fiscal discipline avoids undermining the program. Beyond that the task of the policy maker is to free markets. As the theory predicts, the inflation rate did converge to zero by 1981, but the overvaluation was enormous as well as the current account deficits.

The story told in figure 4 could be made more precise by the introduction of wage indexing, movements in foreign interest rates, government

intervention in the assets market and fiscal reforms. We now explore the effects of an increase in foreign interest rates in the presence of real wage resistance. Real wages can be made rigid by the presence of indexation to the cost of living index, as represented by the horizontal schedule in figure 5. Constant real wages and assets market equilibrium now occur simultaneously at point A in figure 5. That is the point where the Brazilian economy sits around 1980, close to full employment, financing a large oil bill by foreign borrowing and suffering from high inflation rates. Under those circumstances, an increase in the foreign interest rate occurs. Assets market equilibrium can only be maintained if domestic interest rates also increase, as shown by point A' in figure 5. The increase in interest rates induces more unemployment. The trade balance improves, but the current account further deteriorates, with the increased interest payments on debt. The Brazilian policy makers, faced by a balance of payments crisis, further intervened in the assets market, increasing domestic interest rates above the international level, and thus creating the biggest recession the Brazilian economy has ever gone through in the post-war period. The fall in GNP in 1981 was estimated to be around 2%, in comparison with the trend growth of 7%, while inflation rates hardly moved. The balance of trade duly moved back into a small surplus, but as already noticed, the recession effects on trade balance are not lasting and the country does face the need of structural reforms and foreign aid.

Other examples of unhappy stabilization programs during the 70's in Latin America are not lacking. Ramos (1980) gives a critical account of the Chilean experience after 1973. Foxley (1981) discusses the distributive effects of the programs in Chile (1973-78), Argentina (1976-78) and Uruguay

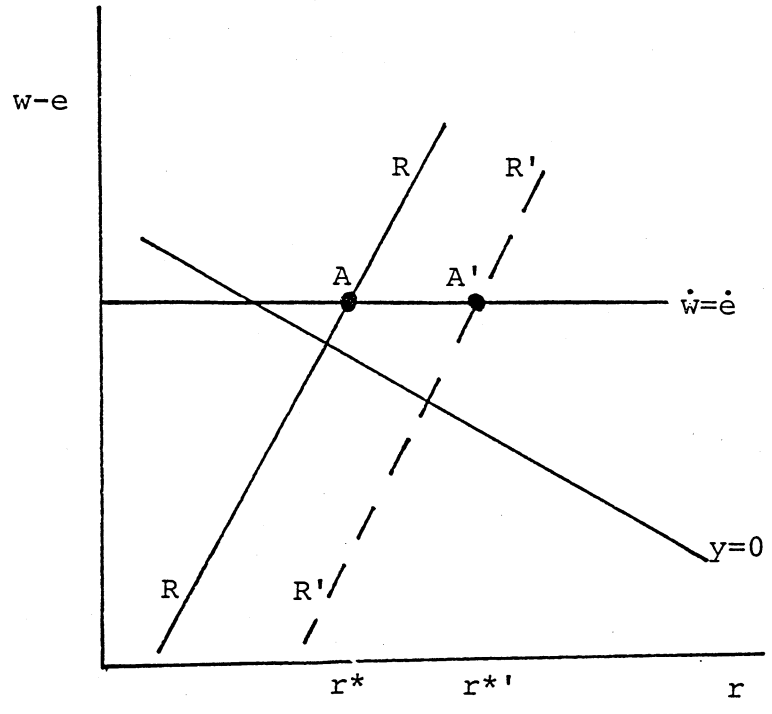

Figure 5

(1974-78). Diaz-Alejandro (1981) examines the vicious cycles between populism and dictatorship in the southern cone, paying special attention to capital movements in the 70's. Peru (1975-78) is discussed in Cline (1981) and Mexico (1977) in Weintraub (1981). Williamson (1982) compares the different strategies adopted in Argentina, Brazil, Chile and Colombia. This list is far from complete, but enough to support sketicism in relation to orthodox programmes.

4. The "repressed" economy

As opposed to the previous models, where high interest rates lead to protracted investment, unemployment and depressed growth, McKinnon (1973), Fry (1982) and others[7] have been able to produce a model where developing countries can induce more capital accumulation by increasing interest rates, and thus be reborn as free economies.

The essential elements of the "repressed" economy models consist on the following assumptions: Savings are an increasing function of the real interest rate. Nominal interest rate ceilings hold the real interest rate below the level at which savings and investment are equalized. Actual investment is limited to the amount of domestic savings. In the open economy, that proposition holds true, only if people cannot borrow abroad nor expand exports. The "repressed" economy is closely related to the two gaps model, in that it assumes investment to be determined by domestic and foreign savings. However, its empirical usefulness, as opposed to the two gaps model, is further limited by the central assumption of an interest responsive savings. That assumption is not verified empirically.

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[7] Fry (1982) surveys the literature on "repressed" economies and gives complete references to his own work.

Leaving aside the government sector, we know from National Accounting that investment, I, is identically equal to savings, S, plus the current account deficit, measured in terms of our own good, $\varepsilon M-X$:

$$I \equiv S + \varepsilon M - X \tag{11}$$

where the real exchange rate $\equiv \varepsilon \equiv EP^*/P$.

Surplus labor exists and the aggregate supply function is:

$$Y/K = \theta \tag{12}$$

It follows that output growth rate equals the growth rate of capital, I/K, called g. Assuming that imports are proportional to investment, $M=\alpha(\varepsilon)I$, with $\alpha' < o$, we can write $\varepsilon M=m(\varepsilon)I$, where $m(\varepsilon)\equiv \varepsilon\alpha(\varepsilon)$. We further assume that the share of savings in income is a positive function of the real interest rate, $S/Y = s(r)$; and that the share of exports in output is a positive function of the real exchange rate, $X/Y = x(\varepsilon)$. We can thus rewrite (11) as:

$$g=(\theta/1-m(\varepsilon))[s(r)-x(\varepsilon)]=\lambda(r,\varepsilon) \tag{13}$$

For a given real interest rate, r_o, we can represent equation (13) by a downward sloping schedule in figure 6.

By imposing the restriction that imports must equal exports we can derive a second expression for the growth rate from the current account:

$$g=(\theta/m(\varepsilon))x(\varepsilon)=\phi(\varepsilon) \tag{14}$$

which we represent by the upward sloping schedule in figure 6. If the real exchange rate falls below ε_o, the growth rate determined by the current account is binding and we sit to the left of $g=\theta s(r_o)$, because at the going exchange rate we cannot afford to import the capital goods we need to grow faster. When the real exchange rate equals ε_o, both constraints are binding and the "repressed" economy grows at the rate $g=\theta s(r_o)$. Keeping the real

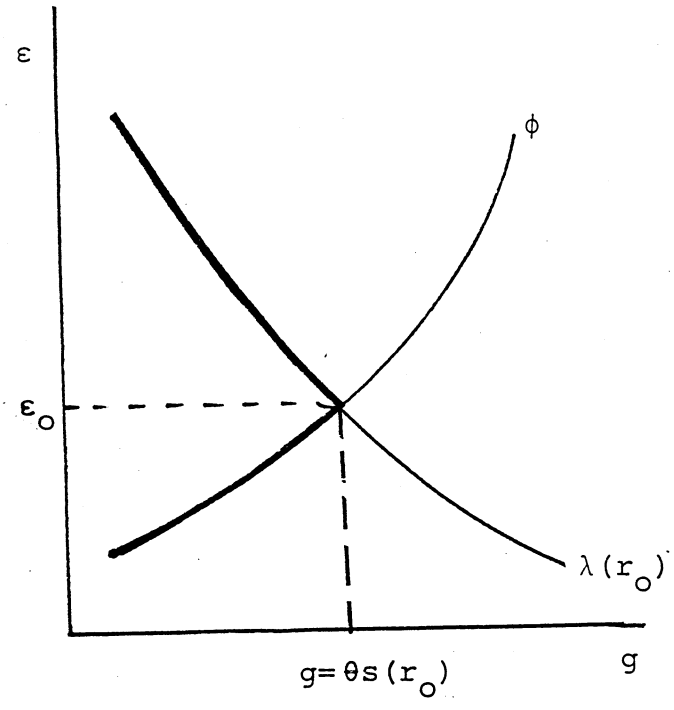

Figure 6

interest rate constant and increasing the real exchange rate would do no good since we cannot grow by foreign machines alone, but also need the domestic investment (savings) to build the infrastructure for the machines to operate. A higher interest rate would shift the schedule $\lambda(r)$ to the right and, if combined with a higher real exchange rate, would induce faster growth.

To close the model, and explain why an increase in the nominal interest rate would induce both, higher real interest rate and higher real exchange rate, we have to explicit the mechanism that determine those variables. Both nominal interest rate and nominal exchange rates are determined by government, so all we must decide about is the behavior of domestic prices. Fry claims that this problem is solved by postulating a Phillips curve. How to combine a full capacity model and zero current account deficit with a Phillips curve remains a mystery. In the closed economy versions of the model, the Phillips curve is defined as a function of the difference between the money supply and the money demand, and the authors explain that in a "two markets economy, excess demand for goods equals excess supply of money"[8]. Nobody knows where the capital stock was hidden away, neither why its price does not move to maintain portfolio equilibrium.

In the open versions of the model, domestic prices are a function of the difference between output and desired spending. Although savings were assumed to be a function of the real interest rate, spending is surprisingly made independent of it.[9]

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[8] Fry (1982) p. 739 and Kapur (1976).
[9] Fry (1982) p.744 and Mathieson (1980).

I am not convinced that specifying the behavior of prices in the "repressed" economy is worth the pain. Even if a case could be made for the existence of credit rationing both in the domestic and foreign markets, the argument that higher interest rates induce faster growth rates can only be made if savings are found to be a positive function of real interest rates. Empirical evidence in favor of this hypothesis is rather shaky. Fry (1978) reports positive findings for Asian countries. Giovaninni (1982) repeating the very experiment was unable to reject the hypothesis that the elasticity of savings in relation to the interest rate was zero. In Latin America, after the recent disasters with high interest rates in Argentina, Brazil and Chile, few economists will be willing to argue the point that higher interest rates induce faster growth.

5. Structuralism

The structuralist thought is much more difficult to pin down than the previous paradigms. As far as I know, Latin American structuralism originally meant that different sectors of the economy develop at different speed, giving origin to bottlenecks. In the presence of downward price rigidities in some sectors, those bottlenecks originate inflation spurts, that money squeezes cannot correct, although they will most certainly provoke more unemployment. Structuralists thus preached for investment in areas where bottlenecks are supposed to appear (those in which the social revenues exceed the private ones), even if those investments are to be financed by money creation and higher inflation rates.

The structuralist economists have very often been identified as "the money is endogenous" school. The "money is endogenous" statement in the structuralist thought is close to the assumption that "monetary authorities

accommodate" in North American models. It was thus different from the endogeneity of money in orthodox models that comes either from the fact that the exchange rate is fixed or from the recognition of the interdependence of monetary and fiscal policies.

There is still one point linked to the Latin American thought which is important for stabilization policies: The inflation process cannot be fully understood by appeal just to budget deficits, cyclical unemployment and bottlenecks. Behind it also lies the sttruggle of different groups in society each trying to get a larger piece of the cake. The models developed in section 2 and 3 assumed a constant mark-up. A process of adjustment through reduced real wages and employment expansion in the export sector puts its burden entirely on wage earners, who were previously employed and see their real wages fall. Structuralists would argue that prices control during the adjustment process will help distribute the costs of adjustment and avoid income distribution deterioration, so often associated with stabilization programs. There is no magic exchange rate or cut in budget deficits that will solve the problems of inequality. The government might be spending in the wrong sectors, and should redirect its expenditures, but some inflation is worth living with. The most difficult of our problems is inflation's twin brother: the unsustainable current account deficits. It would be helpful if the North were willing to lower real interest rates, cut down protection and increase investment in the South.

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