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A THREE-GAP MODEL OF FOREIGN TRANSFERS AND
THE GDP GROWTH RATE IN DEVELOPING COUNTRIES

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SUMMARY

A simplified macroeconomic framework is developed for the "fiscal gap", which is increasingly felt to be the most important stumbling block for adjustment with growth in highly-indebted developing countries. Distinctive characteristics of a fiscally constrained economy are compared with those of economies constrained either by the availability of savings or foreign exchange. Tentative implications for external conditionality accompanying debt-relief measures are derived.

RESUMO

Desenvolve-se um modelo macroeconômico simplificado para o "hiato fiscal", que está sendo crescentemente considerado como a principal pedra no caminho do ajuste com crescimento de países em desenvolvimento altamente endividados. Características próprias de uma economia restrita pela capacidade de financiamento do governo são comparadas com aquelas de economias restritas pela disponibilidade seja de poupança seja de divisas estrangeiras. Implicações preliminares para um sistema de condicionalidades externas, acompanhando medidas de alívio da dívida, são apresentadas.

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1. INTRODUCTION¹

The two-gap model is a popular feature of development economics. It deals with the interactions between the "savings constraint" and the "foreign exchange constraint" in the determination of the growth rate of a developing country².

More recently, there has been an increasing interest in the "fiscal constraint" as a possible third gap, limiting the growth prospects of the highly-indebted group of developing countries³.

¹ Prepared under contract with UNCTAD for the G-24 as a background paper for a report on the future of the World Bank. The views expressed in this paper are those of the author and do not necessarily reflect those of the UNCTAD Secretariat. I am indebted for comments on a preliminary draft to Lance Taylor and participants in seminars at U.C. Berkeley, Fedesarrollo/Colombia, U. Florida, IMF, Stanford U., PUC/RJ, and UCLA.

² The basic references for the two gap model are Chenery and Bruno, Chenery and Strout, and McKinnon. An update is offered in Bacha (1984).

³ Cf., for example, Buiters, Carneiro and Werneck, Fanelli and Frenkel, Reisen and Trotsenburg, Taylor, Wijnbergen.

The purpose of this paper is to develop a very simple model of a fiscally-constrained highly-indebted developing economy, which attempts to replicate some of the most important macroeconomic aspects of the growth process of a large number of developing countries in the world today.

Particular attention is paid to the impact of foreign transfers on the potential GDP growth rate and on the rate of inflation of the debtor country. A discussion is also included of possible roles for external conditionality, designed to maximize the stabilization and other desirable impacts of debt reduction measures.

The following section presents the model for the three gaps. Section three studies the impact of foreign transfers on the growth rate, in the context of this three gap model. Conclusions are summarized in section four.

2. THE THREE GAPS

We deal successively with the savings gap, the foreign exchange gap, and the fiscal gap.

2.1. Savings gap

From the basic national accounting identity asserting the equality between income and absorption, we can write:

$$I = (Y - C) + (M - X) \quad (1)$$

where: I is fixed capital formation, Y is domestic output (GDP), C is (private plus government) consumption, M is imports of goods and non-factor services, and X is exports of goods and non-factor services.

From the balance of payments, the excess of imports over exports is equal to foreign transfers, i.e., the difference between net capital inflows, F , and net factor services to abroad, J^* :

$$M - X = F - J \quad (2)$$

Replacing (2) in (1):

$$I = (Y - C) + (F - J) \quad (3)$$

When income is at its potential level, Y^* , and private consumption is given exogenously, equation (3) yields the savings constrained level of investment - which we write as IS - and, hence, the savings-constrained potential growth rate of output, if ICORs are assumed to be constant⁴.

The savings gap is thus written as:

$$IS = (Y^* - C) + (F - J) \quad (4)$$

⁴ Notice that in (2) we are assuming that foreign reserves accumulation is netted out of the capital account of the balance of payments, to obtain the net value of capital inflows.

⁵ The assumption of fixed consumption could be replaced by the typical Keynesian consumption function without altering the results. Notice also that the exogeneity of the RHS variables is conditioned on the resulting value of I being non-negative.

The first term in the RHS will be denominated "internal (or domestic) savings" and the second, "foreign transfers". Notice that we could shift the value of J from the first to the second term in the RHS, in which case we would obtain:

$$IS = (Y^* - J - C) + F \quad (5)$$

In this case the first term in the RHS is "national savings" (or savings out of national income) and the second is "foreign savings". The analysis to follow is based on (4) rather than on (5), for one basic reason⁶. And this is that interest rate variations, which are the main source of changes in J in the short-run, are not under the control of the debtor country government. These variations are exogenous to the policy making process of the debtor country, the same as with capital inflows, in a foreign credit constrained economy. Thus, foreign transfers, F-J, are a decision variable beyond the control of national authorities.

More specifically, in the following we will assume that all foreign debt is owed by the government. In this case, (4) will lead to the concept of a "primary budget surplus in current account", which is a natural control variable for the government. In contrast, (5) leads to the concept of "government savings", which is not fully under the control of the government, when interest payments are a large fraction of the budget.

⁶ This discussion is further elaborated in a companion paper, see Bacha(1989).

To see this, split consumption into private consumption, C_p , and government consumption, G . Domestic income, Y , is split into private income, Y_p , and government gross income, T^* . Then, from (3):

$$I = S_p + (T - G) + (F - J) \quad (6)$$

where $S_p = Y_p - C_p$ is private savings.

Assuming that all foreign capital inflows are to finance the government budget, and also that all factor service outflows are paid out of gross government income, (6) splits the sources of investment financing into private savings, S_p , primary budget surplus in current account, $T - G$, and net foreign transfers to the government, $F - J^*$. With all variables in the RHS treated as exogenous, and Y_p fixed at the full employment level of income, Y_p^* , (6) yields the form of the "savings gap" which we will be using in the following⁷:

$$IS = S_{p^*} + (T - G) + (F - J) \quad (7)$$

⁷ Factor payments to abroad are a subtraction from the government budget, thus, government net income is $T - J$. If the government has a domestic interest bearing debt, T must be understood as net of interest payments on this debt.

⁸ This interpretation of equation (6) implies the absence of capital flight, as all financial transactions with foreigners are assumed to pass through the government budget. Notice also that (6) could be written as: $I = S_p + (T - J - G) + F$. In this case the sources of investment financing are private savings, government savings, and foreign savings. With J exogenously determined, government savings is not totally under domestic control, which is the reason why this more traditional formulation is replaced by (6).

⁹ For simplicity, taxes are assumed invariant to income, but this assumption could be easily relaxed without affecting the results.

where $Sp^* = Yp^* - Cp$ is private savings at the potential output level.

2.2. Foreign exchange gap

To derive the foreign exchange constraint, we start from (2). Assume that imports can be divided into two types: complementary capital goods imports, M_k , and other imports, M_o . Define net exports, E , as the difference between exports and other imports:

$$E = X - M_o \quad (8)$$

and let M_k be given by:

$$M_k = mI \quad (9)$$

where $0 < m < 1$ is the import content of investment.

Replacing (8) and (9) into (2) and reshuffling terms, one gets:

$$I = (1/m)[E + (F - J)] \quad (10)$$

Introducing the critical assumption that the level of net exports, E , cannot surpass a critical value, E^* , given by world demand, the foreign exchange constrained level of investment - which we write as IE - is given by^{1*}:

^{1*} As other imports are netted out of exports to get net exports, the implicit assumption is that these other imports are invariant to domestic income levels. Again, this could be relaxed without affecting the results. Equation (12) assumes $F - J$ to be exogenous, which implies that foreign reserves accumulation are also exogenous. As before, the exogeneity of the RHS variables is conditioned on IE being non-negative.

$$IE = (1/m)[E* + (F - J)] \quad (11)$$

As $m < 1$, a comparison of (7) with (11) immediately yields the Chenery-result that foreign transfers have a bigger impact on the growth rate of foreign-exchange constrained economies than on saving-constrained economies.

2.3. Fiscal gap

As the debt crisis lingers on, there is an increasing feeling that for many highly indebted middle-income developing countries (Brazil being a conspicuous example), the main source of growth (and inflation) difficulties derives from government budget limitations, rather than from foreign exchange constraints or an overall savings restriction.

A simple formalization of this conception is as follows. Split capital formation between government investment, I_g , and private investment, I_p :

$$I = I_g + I_p \quad (12)$$

Using (12) in (6), we obtain the following expression for the government budget constraint:

$$I_g = (S_p - I_p) + (T - G) + (F - J) \quad (13)$$

Next, assume that private investment depends on government investment, in such a way that, as a maximum, its value is:

$$I_p = k^* \cdot I_g, \quad k^* > 0 \quad (14)$$

Equation (14) expresses the idea that late-comer development is characterized by a central role for government

investment, in infrastructure and basic industries, which sets an upper limit for profitable private investment to occur. This is the crowding-in hypothesis, rooted in Gerschenkron's analysis of European history and with significant empirical support in the successful post-WW-II industrialization drives of countries as diverse as Brazil, Israel, India, Korea, Mexico, and Turkey¹¹.

Recent experience in high-inflation countries in Latin America also suggests that the carrying-power of public investment over private investment may be a decreasing function of the inflation rate. For virulent inflation is accompanied by a significant increase in relative price volatility, hence reducing the information value of the price system for private investment decisions. Moreover, virulent inflation also signals that in the near future either a hyperinflation will occur or taxes will increase, both alternatives very likely having significantly negative effects on the profitability of investment. These considerations suggest that the relationship between inflation and growth, along the fiscal constraint, is in fact more negative than indicated by equation (14), which takes k^* to be a fixed parameter, independently of the rate of inflation.

The final critical step is the assumption that there does not exist a long-term market for government bonds, which leaves money printing as the only alternative for domestic financing of

¹¹ For a review of the empirical evidence on the relationship of government infrastructure investment and private investment in developing countries, see Blejer and Khan.

government budget deficits. In particular, this means that potential private savings may be available, in the sense that $S_p^* - I_p$ is positive at the potential output level, and yet, it is only through seignorage that the government is able to capture this excess savings. Seignorage we will assume to be a function of two variables: the rate of inflation, p , and the propensity to hoard, h ¹². We thus have:

$$S_p - I_p = dH/P = f(p, h) \quad (15)$$

where dH is the variation in nominal money holdings and P the price level¹³.

The relationship between seignorage and inflation has the traditional Laffer-curve shape: seignorage first increases with inflation but eventually decreases with it.

The propensity to hoard is introduced for completeness, as it seems to vary substantially among countries and through time in some countries, being particularly high today in Southeast Asia. Hence it might be an important policy instrument, if more were learned about its determinants.

¹² Seignorage decomposes itself into an inflation tax and a change in real money holdings: $dH/P = p(H/P) + d(H/P)$. Equation (15) imposes the steady state condition $d(H/P) = 0$, and hence treats seignorage and the inflation tax as one and the same thing.

¹³ In this specification, we continue to assume "capital flight" away, as (15) implies that domestic residents do not buy foreign assets. This makes this model more relevant for Brazil, India, or Korea, than for Mexico, Argentina, or Venezuela. Alternatively, if one were willing to assume that "capital flight" was a negative function of foreign transfers, then the former phenomenon could be accommodated in the analysis.

Replacing (15) in (13), and the result in (12), and also replacing (14) in (12), the fiscally constrained level of investment - which we write as IT - is given by:

$$IT = (1+k^*)[f(p,h) + (T - G) + (F - J)] \quad (16)$$

As an introduction to the analysis of the interactions between the three gaps, notice that equations (14) and (15) can be read in different ways. In particular, for a given rate of inflation, equation (15) can be made consistent with (14) only if private savings is a slack variable. But, under our assumption of a constant private consumption level, this will not occur when output is at its potential level, i.e., when the savings gap is binding. If this is the case, in the following we will assume that (15) determines not private savings but the actual level of private investment, which will thus be less than $k^*.I_g$. That is, if savings is binding, private investment is crowded out of the financial market¹⁴.

Private savings will also not be a slack variable when output - and, hence, savings - is at the level determined by the foreign exchange constraint. In this case, we will also assume that private investment is crowded out, i.e., it will be less than its maximum value, $k^*.I_g$. Crowding out in this case occurs in the foreign exchange market.

¹⁴ Crowding out is best viewed in this fix-price model as being done through the imposition of quantitative limits on credit expansion to the private sector. In a more complete model, interest rate variations could be allowed to do this job.

These interactions are illustrated in Figure 1, with private savings in the vertical axis and the inflation rate in the horizontal axis. With I_p given by (14), (15) can be seen as tracing the variation of private savings as the inflation rate changes. This is the relation depicted by the dome-shaped curve ST. In this figure, the straight line, SY, gives the level of private savings at a fixed income level, as determined either by the savings gap (potential income) or the foreign exchange gap (balance of payments constrained income level).

This means that there is an upper limit (which in Figure 1 is below the value corresponding to the maximum seignorage generated by the Laffer curve) on how much the government can force the private sector to save - a limit which is a function either of potential output or the balance of payments constrained output level.

Once this limit is reached, further increases of inflation can elicit additional financing for the government only by "crowding out" private investment. This means that the "crowding in" hypothesis expressed in equation (14) is only operative for rates of inflation less than p' in Figure 1. For rates of inflation between p' and p'' , the fiscal constraint does not bind, equation (14) does not apply, and private investment is determined by the limits imposed by equation (15).

Thus, as public investment rises, fueled by inflation rates rising from p' to p'' , private investment falls by an equal amount. For this inflation range, the "crowding out" hypothesis

avored by Balassa et al. takes over from the Gerschenkronian "crowding in" hypothesis. In this fixprice model, domestic credit limitations and quantitative import controls are the natural policy instruments to enforce the crowding out of private investment.

To summarize, the fiscal constraint applies only in the inflation range from zero to p' ; from p' to p'' , either the savings constraint or the foreign exchange constraint apply. Finally, from p'' onwards, what can perhaps better be described as an hyperinflation regime emerges, with further increases in the inflation rate being associated with unemployment and lower savings and investment rates.

We now proceed to study in more detail the interaction between the three gaps, with emphasis on their relations with foreign transfers.

3. TRANSFERS AND THE THREE GAPS

To consider the impact of foreign transfers on the economy of the debtor country, it is useful to proceed with an analysis of the interactions between the three gaps, two at a time. We first analyze the interactions between the savings and the foreign exchange gap, which are the object of the traditional two-gap

model. Next, we study the interactions between the fiscal gap and the savings gap; to conclude with an analysis of the interactions between the fiscal gap and the foreign exchange gap.

3.1. Savings and foreign exchange gaps

A traditional picture of the relationship between investment (or GDP growth) and foreign transfers in the context of the two-gap model is in Figure 2, with foreign transfers in the horizontal axis, and investment in the vertical axis. Under the assumption that $(1/m)E^* < S_p^* + (T-G)$, the savings gap from equation (7) is represented by line IS, and the foreign exchange gap from equation (11), by the line IE^{16} . If foreign transfers are less than $(F-J)'$, the foreign exchange gap is binding; if foreign transfers are higher than this, the savings gap becomes the relevant growth constraint. When investment is at I' , both constraints are binding.

If savings alone is binding (which means that available productive capacity is being fully utilized), we will assume that net exports will give in when investment rises above I' . This means that, in a savings constrained regime, net exports will be less than its maximum value, E^* , given by foreign demand, which

¹⁶ The inequality above ensures that when foreign transfers are null, the foreign exchange constraint is binding, but this is not necessary for the analysis, provided that foreign exchange is binding at some negative level of foreign transfers, and before investment drops to zero.

will be left unsatisfied (possibly through an export quota system, as typically occurs in Latin America). Actual net exports will be equal to the difference between potential output and domestic demand for domestic goods, or:

$$E = Y^* - [C + (1-m)IS] \quad (17)$$

In contrast, when the foreign exchange is binding, investment will be less than made possible by potential savings, and, as a consequence, in a Keynesian fashion, income will fall below its potential value, Y^* , being determined by the aggregate demand for domestic goods, according to¹⁷:

$$Y = C + (1-m)IE + E^* \quad (18)$$

In the Chenery-Bruno analysis of the 1960s, the foreign exchange gap was viewed as a long-term characteristic of developing countries. This may still apply to mineral and crop economies at an early stage of industrial development but, for at least some middle income developing countries, the "foreign exchange gap" is perhaps more appropriately viewed as a short-run phenomenon.

Thus, when an external shock occurs, such as a reduction in foreign transfers, accommodation to the resulting external disequilibrium is initially done in a Keynesian fashion, i.e., by a reduction of output levels. Over the medium run, as suggested by the recent adjustment experience of some of the Latin America countries with stronger industrial basis, net exports will tend to rise until the "savings gap" becomes binding¹⁸.

¹⁷ As income falls below its potential value, so does the level of private savings.

¹⁸ In the following section, we will argue that more frequently than not the relevant binding constraint will be the fiscal gap rather than the savings gap.

An illustration is provided in Figure 2. When foreign transfers fall from $(F-J)'$ to $(F-J)''$, investment initially drops from I' to I'' , according to the foreign exchange constraint. At this investment level, available capacity is less than fully utilized, as the savings constraint is not binding. Through time, industrial exports increase to fill up the output gap. This releases foreign exchange for a partial recovery of investment, which rises from I'' to I''' , thus reestablishing the savings constraint.

3.2. Savings and fiscal gaps

The interactions between the savings and fiscal gaps are easier to explore in a diagram with the inflation rate in the horizontal axis and investment in the vertical axis, as in Figure 3. The straight line IS' represents the savings gap, as given by equation (7). The dome-shaped curve IT' represents the fiscal gap, as given by equation (16).

The economy is initially bound by both constraints, with investment I' and inflation p' . Consider the consequences of a reduction of foreign transfers, $F-J$, which shifts both curves downward, to IS'' and IT'' . As $(k^* + 1) > 1$, IT' declines by more than IS' does. At the initial inflation rate, the fiscal gap becomes binding, and investment falls to I'' . Unused capacity emerges, as the savings constraint is no longer binding.

What happens next depends on government policy choices. From the point of view of growth recovery, the best policy response would be an increase in the government primary surplus, which shifted IT and IS back to their original positions. In this case, the budget surplus would replace foreign transfers as the source of government investment financing. This might picture South Korea's adjustment process in the eighties.

If this fiscal effort is not feasible politically, then one tempting alternative would be to use inflationary-finance to prop up public investment. This course of action is indicated by the arrows along the curve IT'' in Figure 3: the investment rate is raised to I''', at the cost of increasing inflation to p''. This is adjustment Brazilian-style.

The worst possible response would be an inflation-financed increase of government consumption. This might occur in cases where the pressure to reduce unemployment through a resumption of public investment were barred by a foreign exchange constraint. As consumption is less import intensive than investment, consumption-generated employment gains are obtained with a reduced impact on the balance of payments. The consequence is a tendency towards hyperinflation at depressed investment levels. Argentina and Peru might be illustrations of this policy pattern.

Squeezed between the political incapacity to generate primary budget surpluses, on one hand, and the fear of hyperinflation, on the other, a debtor country has finally the option of staying put, thus simply accomodating the external

financial shock by a reduction of investment and an increase in unemployment (points I'' , p' in Figure 3). This stagnationist pattern would seem to characterize the typical response of smaller Latin American and African countries to the debt crisis.

Consider now the consequences of an increase in foreign transfers, which is analyzed in Figure 4, with investment in the vertical axis and foreign transfers in the horizontal axis. Initially, investment is at I' with foreign transfers at $(F-J)'$. When foreign transfers increase to $(F-J)''$, the savings gap becomes binding and private investment is crowded out. I.e., investment rises to I'' , rather than to I''' , as would be indicated by the fiscal constraint.

An attractive policy alternative would be to use part of the additional foreign transfers to reduce domestic seignorage. This would have two beneficial effects. First, it would allow a reduction of inflation. Second, it would release private savings to finance additional private investment, up to $k*$ times the additional public investment. This policy alternative is indicated in Figure 4 by a downward shift of the IT curve - as a consequence of a decline of p^{19} .

Inflation reduction is a public good, whereas an expansion of public sector investment (to the point of crowding out private investment) might respond to the interests of the government

¹⁹ In conditions of chronic inflation, it is now widely accepted that fiscal austerity needs the support of a deindexation policy to obtain an immediate decline in p . Cf., for example, the papers in Williamson.

bureaucracy. As it is not clear which of the two alternative courses of action - an 'excessive' expansion of public investment or a reduction of inflation - would be favored by the domestic policy makers, a case might be made for enlightened external conditionality, associated with an increase in foreign transfers. That is, foreign transfers would be conditioned on the adoption of a sensible stabilization policy. The point however needs to be stressed that public investment does need to increase in order to prop private investment up. The caveat is that it should increase by less than the additional foreign transfers, as part of these ideally should be used to replace money printing as a financing mechanism.

3.3. Foreign exchange and fiscal gaps

We finally consider the relationship between the fiscal gap in equation (16) and the foreign exchange gap in equation (10). The position of these curves in the $[F-J, I]$ plane depends on the relative sizes of i/m and $i+k^*$. In principle, i/m could be either larger or smaller than $i+k^*$. If $i/m > i+k^*$, the capital goods import content of investment is less than the government share of investment. This would be the case of a large developing country where industrialization is both state-led and relatively advanced, such as Brazil. In contrast, the case $i/m < i+k^*$ would apply to a small private oriented developing economy, such as Taiwan.

Figure 5 depicts the interactions between the foreign exchange gap - line IE - and the fiscal gap - line IT - when $1/m > 1+k*$. Initially, with foreign transfers at $(F-J)'$, investment is at I' . As foreign transfers fall to $(F-J)''$, the foreign exchange gap becomes binding. A typical sequence of events might then be: at first the country allows its foreign reserves to fall (which would push $F-J$ temporarily to the right); when reserves are exhausted, government investment would be cut off and stiff foreign exchange controls introduced. The latter would crowd private investment out, thus reducing total investment to I'' , along the foreign exchange constraint line.

The next stage would consist of a reaction of exports, making use of the accumulated slack in the domestic economy. The fact that the coefficient m is relatively small signals to the fact that this is a relatively advanced developing economy, hence, in principle, capable of expanding industrial exports. The export expansion would shift the IE curve upwards - to IE' in Figure 5 - thus allowing a partial recovery of investment, to I''' . At the end of this medium-term adjustment process, further growth of the economy would be bound by the fiscal constraint.

An interesting exercise under these circumstances is to consider the consequences of an increase in foreign transfers. Let us assume in Figure 5 that, starting from $(F-J)'$, foreign transfers are raised to $(F-J)+$. The fiscal constraint restricts the growth of investment to $I+$, which is less than the $I++$ level, allowed by the balance of payments restriction. What is likely to happen ?

Notice that if net exports are kept at E^* (i.e., at the world demand level) and investment is only at I^+ (rather than at I^{++}), then the balance of payments is in surplus, i.e., foreign reserves are accumulating at a faster rate than planned. As a consequence, the increase of foreign transfers is less than indicated by the movement from $(F-J)'$ to $(F-J)^+$, and the allowable investment rate is also less than I^+ .

Part of the additional transfers would thus be used "unproductively", to accumulate foreign reserves. The government might want to prevent this from occurring, for example through the introduction of an export quota system or a liberalization of other imports. But these measures should find strong resistance. First of all, from the producers of tradables, especially when the domestic market is still in a recessive state (as we are implicitly assuming to be the case, since the savings gap is not binding). Second, from foreign creditors, who will welcome the increase in reserves as a sign that additional debt relief needs not be provided, and will thus ally themselves with exporters in defense of the maintenance of an "outward oriented economic policy".

If the government yields to such pressures, at the same time that it insists in maintaining the highest possible level of investment allowed by the foreign transfers, it would soon find itself financing the acquisition of the surplus foreign exchange by additional money printing. Inflation would go up and, provided that the country is still in the good side of the Laffer curve,

private savings would expand to sustain an increasingly high level of investment, until the foreign exchange gap becomes binding. This is indicated in Figure 5 by an upward shift of IT to IT+.

Countries facing a fiscal constraint - but not a foreign exchange constraint, neither a savings constraint - thus find themselves in a difficult position to argue for debt relief. They would either lack absorptive capacity, and increase foreign reserves without limit, or would have to resume an inflationary course of growth.

Fiscal austerity is an alternative to this conundrum, as an increase in the primary budget surplus in current account would manage to shift IT to IT+. This would permit the full growth potential of the country's export capacity to be realized without an acceleration of inflation.

This discussion suggests that here too there seems to be a case for enlightened external conditionality, i.e., one that conditions debt relief measures to the implementation of a fiscal austerity program. Notice, however, that, for growth purposes, the two measures need to come together, for if F-J stays put at (F-J)' in Figure 5, the only consequence of domestic fiscal austerity would be reduced inflationary pressures, but no additional growth, as this would continue to be restricted at I' by the foreign exchange boundary. Furthermore import liberalization measures would make sense only if, at I''', the savings constraint is already binding.

This discussion suggests that, once the critical role of public sector investment in the growth process is recognized, 'balancing the budget' - which is the first commandment of the Bank and Fund gospel - seems to be a good advice for fiscally constrained economies to follow. 'Getting the prices right', however - which is their second commandment - may not be so useful.

To see why, let us consider the case of a real exchange rate devaluation, which is a frequent requirement of Bank and Fund programs. One may grant that potential net exports is a positive function of the real exchange rate: $E^* = E^*(R/P, \dots)$, where R is the nominal exchange rate; P , the price level, and a dot stand for other variables entering the function. From the perspective of the foreign exchange constraint, this should be enough to suggest the government of the developing country to follow a policy of real exchange devaluations.

However, when consideration is given to the fiscal constraint, this policy may not be as advisable, if the country is being subject to a negative net transfer from abroad. To see this, observe that the net transfer, $F - J$, is valued in domestic currency, and deflated by a domestic price index, as all other variables in the model. Thus, this difference can as well be written as: $(R/P)(F^* - J^*)$, where $F^* - J^*$ is the foreign transfer in dollar terms, and R/P the real exchange rate. If $F^* - J^*$ is negative, a devaluation of the real exchange rate will affect negatively the government budget constraint, forcing additional money printing or else a decline of the rate of investment.

Thus, if it is the fiscal constraint and not the foreign exchange constraint that is binding, a policy of 'getting the prices right' through real exchange devaluations worsens, rather than helping to solve, the adjustment problem of a heavily indebted developing country, which is being subject to negative net transfers from abroad.

4. CONCLUSIONS

From a formal point of view, the three gap model of this paper is an exercise in the maximization of investment (as a proxy for the output growth rate), in a fixprice one-period growth model, subject to a number of equality and inequality constraints. The equality constraints are the balance between income and absorption, the balance of payments identity, the government budget constraint, and the equality between the flow supply and the flow demand for money. The inequality constraints are that actual income cannot be higher than potential income (implying that private savings cannot be higher than potential private savings), actual exports higher than export demand, and private investment higher than k^* -times government investment. Furthermore, private consumption, imports other than capital goods²⁰, the government budget surplus in current account, the

²⁰ Capital goods imports are assumed to be a constant fraction of investment.

inflation rate, and foreign transfers are all assumed to be predetermined.

In this context, the analysis focussed on the impact of changes in foreign transfers on the output growth rate, under varying assumptions about the relevant growth constraint, and alternative policy responses by the government.

An initial result is that foreign transfers is a more relevant concept than foreign savings, to analyze the financial interactions between the developing country and the outside world. For policy purposes, it is important to distinguish between variables which are and which are not under domestic policy control. In this context, foreign transfers is a more relevant concept than foreign savings, as the later does not take into account factor services outflows, which are totally predetermined from a domestic policy point of view.

An intermediary result is that a fiscal constraint can be defined independently of the overall savings constraint. This basically requires two eminently plausible assumptions. First, that in late-comer industrialization public investment is more frequently than not complementary to private investment. Second, that domestic capital markets are very restricted, which leaves seignorage, or the inflation tax more specifically, as practically the only alternative to finance government budget deficits in developing countries.

Furthermore, a case was also made that the government budget constraint will tend to be the relevant medium-term growth

limitation, particularly when the developing economy suffers an external financial shock.

This has the important implication of pointing out the intimate relationship that may exist between external shocks and domestic financial maladjustments: accelerated inflation can be the consequence of an attempt by the government to recover part of the output and growth losses, caused by the external financial shocks. It also qualifies the advisability of adopting a policy of real exchange rate devaluations, which may help exports but will worsen the fiscal position of a debt-ridden developing country government, which is being subject to a negative net transfer from abroad.

The likely consequences of debt relief measures were also discussed. As the model was set up, the developing country government has an overriding objective: to maximize the growth rate of output. This means that public investment will tend to have a prior claim on resources, crowding out exports and private investment, and extracting additional private savings through accelerated inflation, if necessary. The alternative to these undesirable social developments would be an expansion of the primary budget surplus in current account and a reduction of money printing, but these courses of action may face significant domestic political resistance, both inside and outside the government.

Conditional external debt relief might provide the necessary incentive for such fiscal austerity measures, thus

ensuring that the growth recovery permitted by the increased foreign transfers is made consistent with the reduction of inflation, of anti-export biases, and of the tendency to crowd-out private investment, which might otherwise tend to occur.

REFERENCES

- Edmar Bacha, "Growth with limited supplies of foreign exchange: a reappraisal of the two-gap model", in M. Syrquin, L. Taylor, and L. Westphal (eds.), *Economic Structure and Performance: Essays in Honor of Hollis Chenery*. New York: Academic Press, 1984.
- Edmar Bacha, "Debt crisis, negative net transfers, and the GDP growth rate of the developing countries", mimeo, PUC/RJ, April 1989.
- Bela Balassa, Gerardo Bueno, Pedro-Pablo Kuczynski, and Mario Simonsen, *Towards Renewed Economic Growth in Latin America*. Washington, DC: Institute for International Economics, 1986.
- Mario Blejer and Mohsin Khan, "Government policy and private investment in developing countries", *IMF Staff Papers*, 31(2): 379-403, June 1984.
- William Buiter, "Some thoughts on the role of fiscal policy in stabilization and structural adjustment in developing countries", NBER WP 2603.
- Dionisio Carneiro and Rogerio Werneck, "External debt, economic growth and fiscal adjustment", Discussion Paper n. 202, Department of Economics, Catholic University of Rio de Janeiro, 1988.
- Hollis Chenery and Michael Bruno, "Development alternatives in an open economy: the case of Israel", *Economic Journal*, 57: 79-103, 1962.
- Hollis Chenery and Alan Strout, "Foreign assistance and economic development", *American Economic Review*, 56: 679-733, 1966.
- Jose-Maria Fanelli and Roberto Frenkel, "A growth exercise for Argentina", mimeo, CEDES, Buenos Aires, February 1989.
- Alexander Gerschenkron, *Economic Development in Historical Perspective*. Cambridge: Harvard U. Press.
- Ronald McKinnon, "Foreign exchange constraints in economic development and efficient aid allocation", *Economic Journal*, 74: 388-409, 1964.
- Helmut Reisen and Axel van Trotsenburg, *Developing Country Debt: The Budgetary and Transfer Problem*. Paris: OECD, 1988.

Lance Taylor, "To WIDER country paper authors on medium-term development strategy: logistics and methodology", mimeo, October 1988.

Sweder van Wijnbergen, "External debt, inflation and the public sector: towards fiscal policy for sustainable growth", mimeo, WB, Washington, DC, March 1988.

John Williamson (ed.), Inflation and Indexation: Argentina, Brazil and Israel. Boston: MIT Press, 1985.

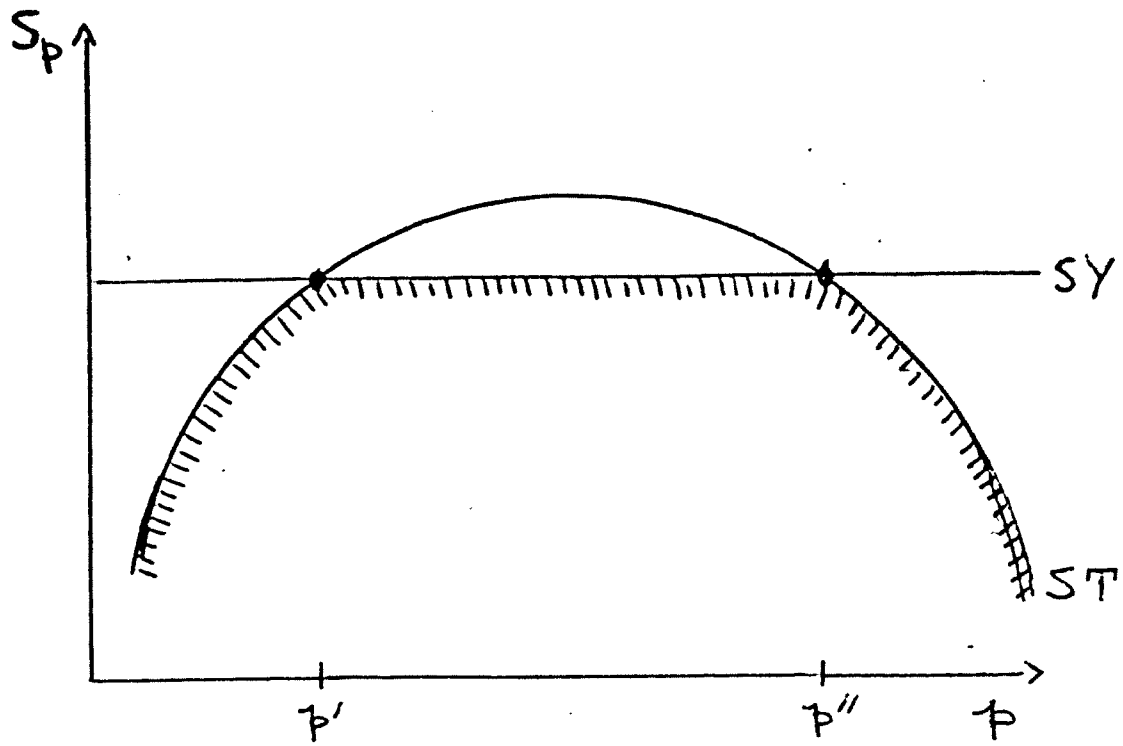


FIGURE 1

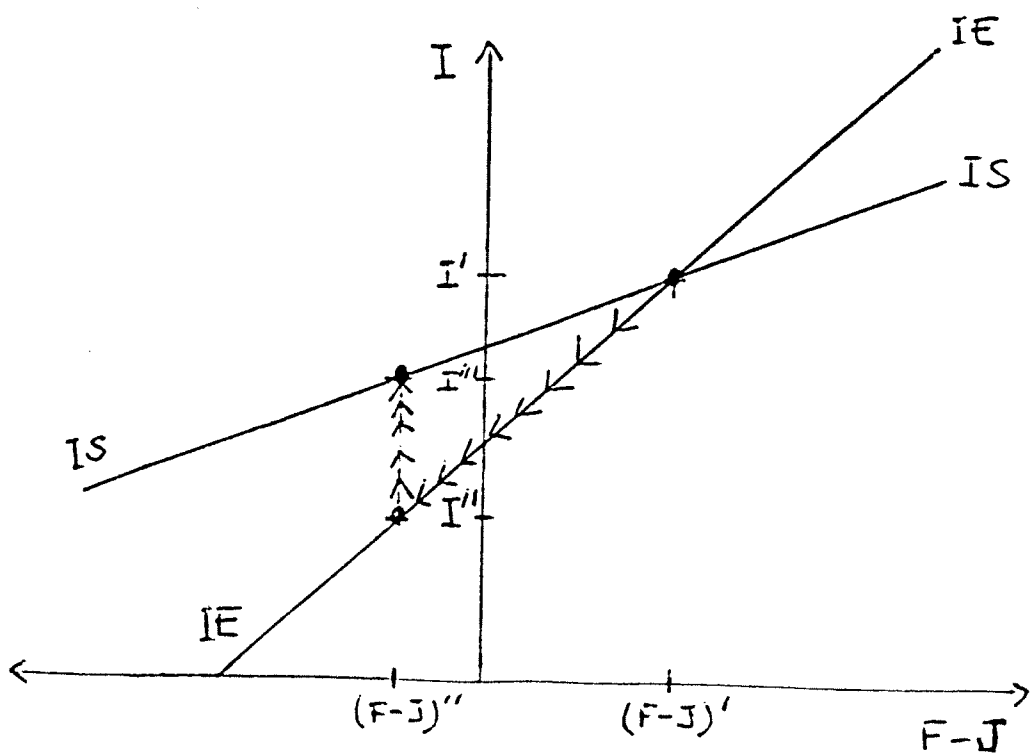


FIGURE 2

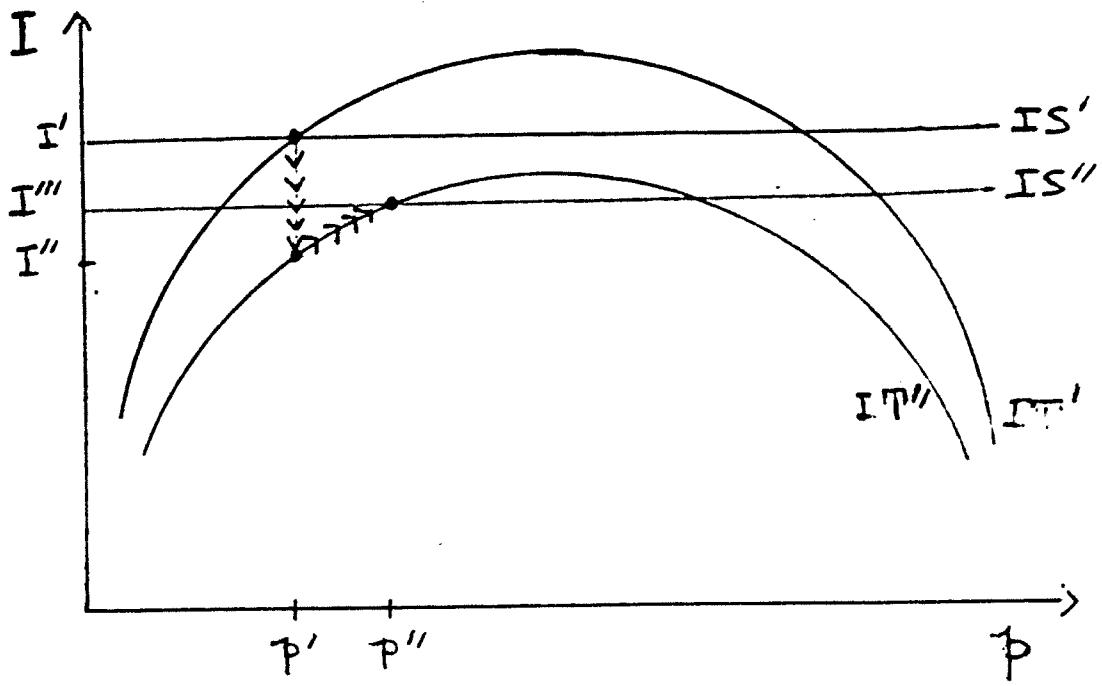


FIGURE 3

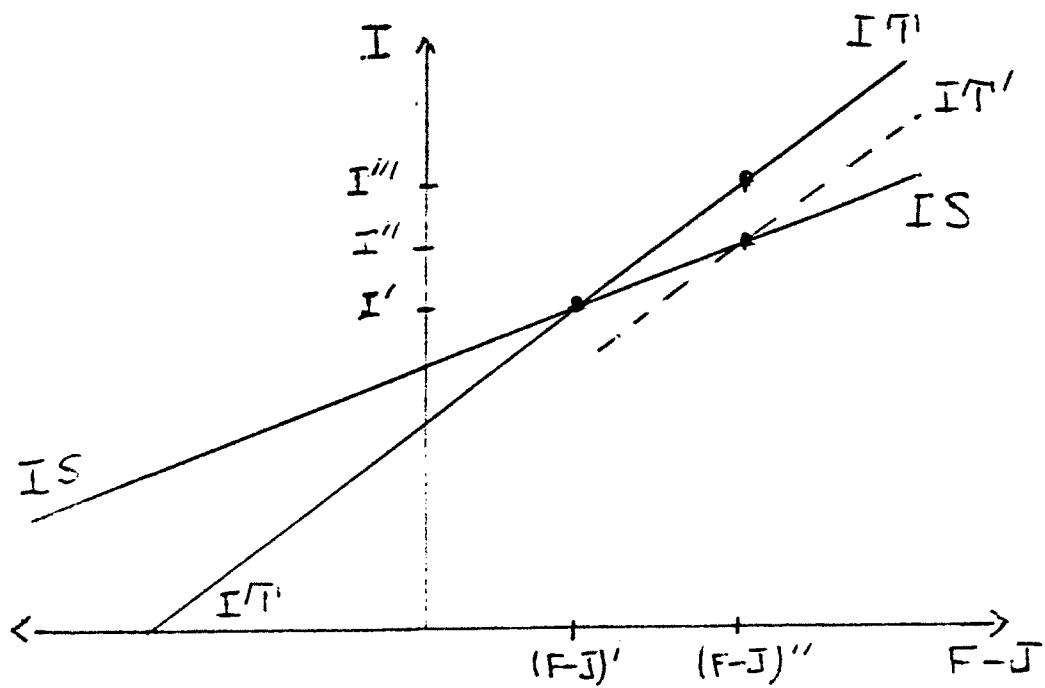


FIGURE 4

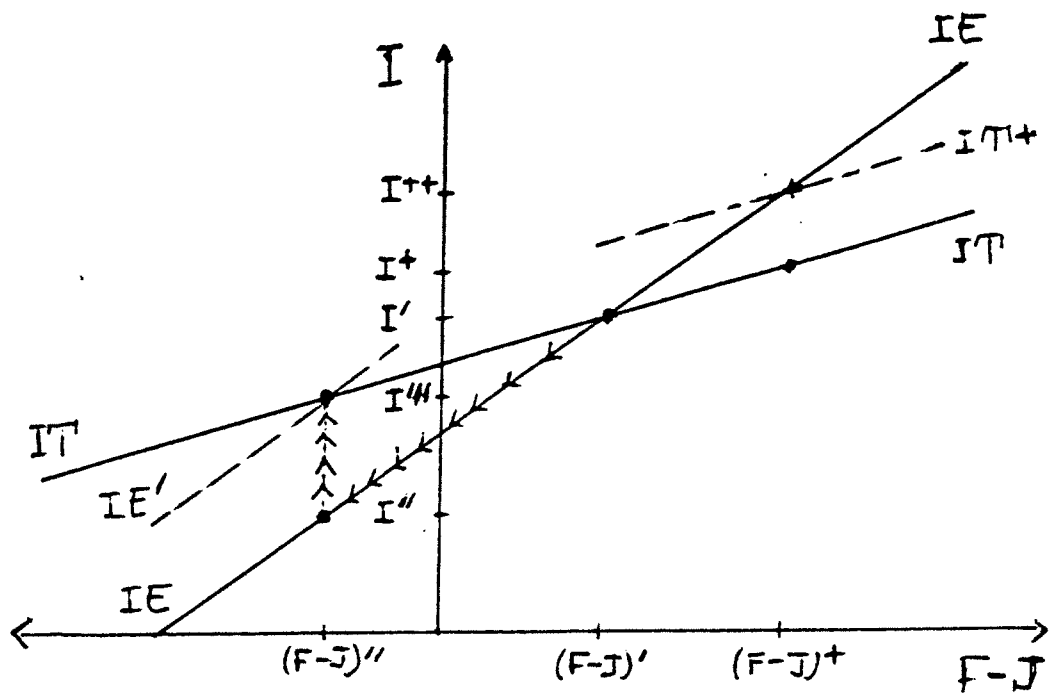


FIGURE 5

TEXTO PARA DISCUSSÃO

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170. Bacha, E.L.; "Project Analysis and Income Distribution: Notes on the IDB/OECD Conference".
171. Modiano, E.M.; "Plano Cruzado: a Primeira Tentativa".
172. Feinberg, R.E. e E.L. Bacha; "When Supply and Demand don't Intersect: Latin America and the Bretton Woods Institutions in the 1980s".
173. Modiano, E.M.; "O PIB em 1987: Expansão, Recessão ou Estagnação?".
174. Bacha, E.L.; "Escaping Confrontation: Latin America's Debt in the Late Eighties".
175. Werneck, R.L.F.; "Um Modelo de Simulação para Análise do Financiamento do Setor Público".
176. Amadeo, E.J.; "Controversies over the Equilibrium Position in Keynes's General Theory".
177. Amadeo, E.J.; "Teoria e Método nos Primórdios da Macroeconomia [IV]: Hicks e o Difícil Compromisso entre Tempo e Equilíbrio".
178. Franco, G.H.B.; "Direct Investment in Brazil: Its Role in Adjustment and Emerging Issues".
179. Carneiro, D.D.; "Heterodoxia e Política Monetária".
180. Modiano, E.M.; "Repases Mensais X Reajustes Trimestrais".
181. Bacha, E.L.; "Moeda, Inércia e Conflito: Reflexões sobre Políticas de Estabilização no Brasil".
182. Corrêa do Lago, L.A.; "Economic Relations of Brazil and the European Economic Community in the Post-War Period: a Historical Perspective and the Present Situation".
183. Modiano, E.M.; "Novo Cruzado e Velhos Conflitos: o Programa Brasileiro de Estabilização de 12 de Junho de 1987".
184. Franco, G.H.B.; "Assimetrias Sistêmicas sob o Padrão Ouro".
185. Fritsch, W. e G.H. Franco; "Investimento Direto: Teoria e Evidência Empírica".
186. Moraes, P.B. e L. Serven; "Currency Substitution and Political Risk: México 1978-82".
187. Abreu, M.P. e W. Fritsch; "Obstacles to Brazilian Export Growth and the Present Multilateral Trade Negotiations".
188. Abreu, M.P. e W. Fritsch; "New Themes and Agriculture in the New Round: A View from the South".
189. Abreu, M.P. e W. Fritsch; "Market Access for Manufactured Exports from Developing Countries: Trends and Prospects".

190. Modiano, E.M.; "The Two Cruzados: The Brazilian Stabilization Programs of February 1986 & June 1987".
191. Abreu, M. de P.; "Indicadores Sociais Revisitados: Paradigmas Internacionais e Brasileiros".
192. Abreu, M. de P.; "British Investment in Brazil: The Relevant Century, 1850-1950".
193. Abreu, M. de P.; "Brazil as a Creditor: Sterling Balances, 1940-1952".
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195. Fritsch, W. e G.H.B. Franco; "Investimento Direto: Tendências Globais e Perspectivas para o Brasil".
196. Werneck, R.L.F.; "Uma Contribuição à Redefinição dos Objetivos e das Formas de Controle das Empresas Estatais no Brasil".
197. Bacha, E.L.; "Capturing the Discount: Towards a Debt Facility at the Bank and the Fund".
198. Bacha, E.L.; "Latin America's Debt Crisis and Structural Adjustment: The Role of the World Bank".
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200. Moraes, P.B.; "A Condução da Política Monetária durante o Plano Cruzado".
201. Franco, G.H.B.; "O Balanço de Pagamentos do Brasil: 1870-1896: Novas Estimativas".
202. Carneiro, D.D. e R.L.F. Werneck; "External Debt, Economic Growth and Fiscal Adjustment".
203. Fritsch, W. e G.H.B. Franco; "Brazilian External Adjustment in the 1990s: The Role of Foreign Direct Investment".
204. Moraes, P.B.; "Inflação e o Número de Intermediários Financeiros".
205. Franco, G.H.B. e E.J. Amadeo; "'Finance', Poupança e Investimento: Nem Keynes nem Robertson".
206. Fritsch, W. e G.H.B. Franco; "Foreign Direct Investment and Patterns of Industrialization and Trade in Developing Countries: Notes with Reference to the Brazilian Experience".
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210. Amadeo, E.J., "Crescimento e Distribuição: um Modelo Estilizado da Riqueza das Nações".

211. Amadeo, E.J., "Equilíbrio Macroeconômico e Modelos Bi-Setoriais".
212. Amadeo, E.J. e Camargo, J.M., "A Structuralist Analysis of Inflation and Stabilization".
213. Amadeo, E.J. e Camargo, J.M., "Market Structure, Relative Prices and Income Distribution".
214. Amadeo, E.J. e Camargo, J.M., "Choque e Concerto".
215. Banuri, T. e Amadeo, E.J. "Worlds Within the Third World: Labour Market Institutions in Asia and Latin America".
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217. Amadeo, E.J. e Camargo, J.M., "Política Salarial e Negociações: Perspectivas para o Futuro".
218. Werneck, R.L.F., "Ajuste Fiscal e Dispendios Não-Financeiros do Setor Público".
219. Fritsch, W. e Franco, G.H.B., "Key Issues on Industrial Promotion: the Current Brazilian Debate".
220. Amadeo, E.J. e Camargo, J.M., "Economic crisis, impact and response: the case of Brazil".