Macroeconomic Policies for Structural Adjustment

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A stable macroeconomic environment and a functioning market
economy are two essential preconditions for successful struc-
tural adjustment. Macroeconomic stability requires a low fiscal
deficit to support external balance and low inflation. Only under
these conditions can a change in microeconomic incentives
succeed in developing resources to their most productive uses.

Structural adjustment is an economywide adjustment effort aimed at allocating resources better. Functioning markets and a low, stable inflation rate are two macroeconomic preconditions for implementing structural adjustment, contends Rodriguez. He further concludes:

In highly distorted economies, the market system must be restored before adjustment efforts are undertaken. An inflation rate over 20 percent is likely in most countries to generate unstable prices that would impair adjustment.

Fiscal deficits and policies about (internal and external) government debt are the key determinants of the inflation process. As a general rule, government debt as a fraction of GDP should not exceed the government's relative participation in generating that GDP.

Fiscal deficits are probably a key determinant of trade deficits — particularly when the fiscal deficit is financed abroad. The trade deficit generally depends on all variables directly linked to the desired rate of foreign savings. Efforts should be made to estimate the equilibrium trade deficit with all available relevant information, as this estimate is important in determining the real exchange rate.

The main determinants of the real exchange rate are the level of excess spending in the economy (measured by the trade deficit), the external terms of trade, and domestic measures of commercial policy that allow for a difference between domestic and foreign prices.

The instruments of the adjustment program may affect the equili' rium values of the key macroeconomic variables: inflation, the fiscal deficit, debt ratios, the trade balance, and the real exchange rate. If they do, measures should be taken to keep the target variables at their desired levels and the endogenous variables at their new equilibrium levels.

In particular, the fiscal deficit should be compatible with the acceptable inf. ion rate — and the real exchange rate should be at its equilibrium level.

Macroeconomic stability is essential to both adjustment and growth. Given a stable macroeconomic environment and the correct microeconomic incentives, resources will be allocated to their most productive use without additional macroeconomic incentives such as subsidized credit or an arbitrarily high real exchange rate. Growth is best served by a functioning capital market; governments should not interfere by controlling interest rates at below-equilibrium level, or targeting an arbitrarily high real exchange rate.

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MACROECONOMIC POLICIES FOR STRUCTURAL ADJUSTMENT

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I. SUMMARY

Structural adjustment is an economy wide adjustment effort aimed at a better allocation of resources. Such a process is bound to require an important degree of resource mobilization and it is our opinion that this cannot be done in an environment of macroeconomic instability or in the absence of a relatively well functioning market system.

Macroeconomic adjustment therefore, enters at two levels in the process of structural adjustment: first is the need to implement a macroeconomic environment favorable to a stable market framework within which adjustment can take place; second, there are the adjustments in key macroeconomic variables required as a consequence of the implementation of the adjustment program.

This paper is concerned with the identification of macroeconomic policies consistent with the long run sustainability of a stable market framework or with changes that may be required as a consequence of the implementation of the structural adjustment program. It is not directly concerned with issues of short run stabilization, although those issues, particularly that of the timing of policies will be mentioned whenever relevant.

Macroeconomic Policies Aiming at a Stable Market Framework.

In highly distorted economies where the price system plays little or no role in resource allocation we recommend that the first efforts, prior to the implementation of the adjustment program, be oriented at the restoration of the market system. Quantity constraints, as well as price controls and other types of income policies are incompatible with the resource reallocation effort required for a successful structural adjustment. These measures, however, are often used in the context of short run stabilization programs. Therefore, if short run stabilization calls for the use of these type of policies, it is recommended that significant structural adjustment efforts be

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postponed until a reasonable degree of functioning of the price system has been restored. As an example, we would discourage any attempt at Trade Reform in the context of an anti-inflation plan based on the use of price controls and/or an overvalued exchange rate.

It is also found that structural adjustment cannot succeed in the context of high inflation. High inflation usually means unstable inflation and is the result of some fundamental macroeconomic disequilibrium. The adjustment program must incorporate macroeconomic policies aiming at the achievement of sustainable long run macroeconomic stability at an acceptable inflation rate. The level of such an acceptable inflation rate will vary from country to country depending on the inflation history as well as the structure of financial markets. It is our judgment, however, that an inflation rate in excess of 20% per year is likely, in most countries, to be unstable enough to generate relative price variability that would impair the structural adjustment effort.

Functioning markets and a low and stable inflation rate are therefore two macroeconomic preconditions for the implementation of structural adjustment.

We find fiscal deficits and policies regarding government external and internal debt as the key determinants of the inflation process. Fiscal deficits are the main source of creation of means of payments that fuel inflation. Inflation can be postponed by resorting to debt financing. However, debt financing in excess of the rollover of the inflationary component on existing debt stocks plus some allowance for real growth of the economy increases real (and relative) debt and therefore contributes to the crowding out of private investment , to the generation of balance of payments problems and to larger future fiscal deficits on account of a higher interest service.

The inflation adjusted fiscal deficit of the public sector must be compatible with the maintenance of the acceptable inflation rate without need to resort to increases in the relative size of stocks of public debt. As a general rule, we propose that government debt as a fraction of GDP should not exceed the relative participation of the government sector in the generation of such GDP. This rule will define the debt/GDP ratios that in turn are required for defining the fiscal deficit compatible with the acceptable inflation rate. A precise formulation of these relationships is presented in Section IV.

Available empirical evidence suggests that fiscal deficits are one of the main determinants of Trade Deficits. This is clearly the case whenever the fiscal deficit is financed abroad. It is also the case whenever the deficit is financed internally and the private sector responds by increasing its foreign indebtedness. In general, however, the trade deficit will depend on all variables directly linked to the desired rate of foreign savings. Efforts should be made at estimating the equilibrium trade deficit with all available relevant information as this estimation is essential for the determination of the real exchange exchange rate.

We view the real exchange rate as the relative price that allows the expenditure and production switching among the categories of Traded and Non-Traded goods. Being a relative price, the real exchange rate is an endogenous variable and the purpose of policy should be that it remains at its equilibrium level. We find the main determinants of the real exchange rate to be the level of excess spending in the economy (measured by the trade deficit), the external terms of trade and domestic measures of commercial policy that allow for a difference between domestic and foreign prices. In Section III we derive an expression for determining the equilibrium value of the real exchange rate as function of the trade surplus, the terms of trade and export and import average ad-valorem tariffs. We recommend that similar expressions be estimated for each country doing adjustment programs and that it be used to insure the compatibility between the real exchange rate and the other macroeconomic variables determining it.

We have therefore obtained a basic structure for insuring a global compatibility of macroeconomic tools and objectives among a relatively small set of variables. The acceptable inflation rate and Debt/GDP ratios define the compatible fiscal deficit(surplus). The fiscal deficit plus the terms of trade and other relevant variables determining the desired rate of foreign savings (like the availability of voluntary foreign financing, levels of interest rates, foreign investment,actual stocks of foreign assets held, etc.) will provide an estimate of the equilibrium Trade Balance. This level of the Trade Balance, in turn, and jointly with the terms of trade and domestic trade tariffs and taxes, determines the equilibrium level of the real exchange rate. If the country manages the nominal exchange rate, we recommend that it be set such that the equilibrium level of the real exchange rate can be obtained without need for inflationary or deflationary adjustment in domestic prices of Non-Traded goods.

The line of macroeconomic causality we have developed here is not widely accepted among policymakers and it is therefore worth emphasize the differences once again. We view the Trade Balance as a macroeconomic variable resulting from aggregate decisions concerning the difference between income and expenditure. As such it depends crucially on those variables that determine the desired rate of accumulation of foreign assets. A Trade Surplus requires that resources move away from the Non-Traded sector into the Traded sector and the Real Exchange Rate is the relative price that allows for this expenditure switching to take place. We therefore view the Real Exchange Rate as being determined by the Trade Balance and not viceversa. We do not recommend using a real devaluation in order to improve on the Trade Balance unless the accompanying required expenditure reducing policy is also put in effect. If the last measure is not done, the end result will likely be inflation, as discussed in detail in Section IV.2.

Macroeconomic Policies During the Structural Adjustment Program

Adjustment programs may differ widely from country to country and depending on the particular sectors being dealt with. It is therefore very difficult to find a general set of rules linking macroeconomic variables and the specific instruments of the adjustment programs.

As a general rule we propose that macroeconomic policies during the adjustment program be aimed at maintaining the stable macroeconomic framework described previously.

The instruments of the adjustment program may have an effect on the equilibrium values of the key macroeconomic variables described before: Inflation, Fiscal Deficit, Debt Ratios, Trade Balance and Real Exchange Rate. If that is the case, measures should be taken so that the target variables remain at their desired levels and the endogenous variables remain at their new equilibrium levels.

In particular, we see the need to instrument measures so that the fiscal deficit remains compatible with the acceptable inflation rate and the real exchange rate remains at its equilibrium level.

With regards to the fiscal deficit, it is bound to be affected by any changes having to do with fiscal, financial or trade reform. Whenever distorting taxes or expenditures are modified as a consequence of the adjustment program, new less distorting taxes or expenditures must be found so that the fiscal deficit remains near the target level compatible with the acceptable inflation rate.

A fiscal reform program may very well produce a sustainable reduction in the fiscal deficit and therefore will allow for a permanent reduction in the acceptable inflation rate. That being the case, the Trade Balance is likely to improve and this will have effects on the equilibrium level of the Real Exchange Rate. The program must therefore allow for the required accommodation in the level of the Real Exchange Rate.

Changes in the levels of trade taxes or tariffs are bound to affect the equilibrium level of the Real Exchange rate and the program must specify what is the required change in this variable as a consequence of the trade reform. We view Real Exchange Rate adjustment in the face of Trade Reform as a crucial ingredient for the viability of such reform. There is abundant experience with Trade Reforms that failed precisely because of the lack of adjustment in this critical macroeconomic variable.

Macroeconomic Policies and Economic Growth

A high and sustainable rate of growth is one of the main purposes of structural adjustment. We view macroeconomic stability as an essential ingredient for adjustment to be successful and therefore as contributing to growth. In other words, the set of policies we have described as contributing to a stable macroeconomic environment is also required for growth to take place.

In general terms, we do not favor the use of specific macroeconomic policies for promoting growth to the extent that these may interfere with efficient resource allocation. More specifically, we feel that given a stable macroeconomic environment and the correct microeconomic incentives, resources will be allocated to their most productive use without need for additional macroeconomic incentives, such as subsidized credit or an arbitrarily high real exchange rate.

It is the case, however, that government spending may crowd
out private spending, and investment in particular, unless it is
fully financed abroad. This fact is not enough to make a case
against any government spending that will be done at the expense
of private investment as the productivity of the former may be
higher than that of the later. This will certainly be the case of
government spending aimed at providing the basic infrastructure
needed for markets to operate. For other types of spending we can
only recommend a careful evaluation and comparison of social
rates of return both of the new activities as well as of the
displaced activities.

Other macroeconomic instruments that are often present in
the discussion of growth oriented policies are the real interest
rates and the real exchange rate. Both are endogenous variables
and we do not recommend policies aiming at keeping them away from
their equilibrium values, even for the purposes of fostering
growth. For example, growth is best served by a well functioning
capital market and this is best obtained when governments do not
try to interfere by controlling interest rates at below than
equilibrium levels.

Section VI presents a brief summary of the recommended
macroeconomic policies. A detailed discussion and justification
of the recommended policies is provided in Sections II-V.

II.MACROECONOMIC ASPECTS OF STRUCTURAL ADJUSTMENT

II.1 Structural Adjustment and Balance of Payments Problems

More than often, countries aiming at structural adjustment programs are facing immediate balance of payments difficulties. External funds, therefore, become a precondition for the implementation of the structural adjustment program. The balance of payments support fund may have little to do with the needs of external funds as a result of the adjustment program and more as a way to buy the needed time to start the design and implementation of the program.

Structural adjustment relies on giving incentives for resource reallocation to their most efficient uses. For that to take place we see it as fundamental that adjustment rely on market forces and be implemented within a relatively stable macroeconomic framework. There is little hope for resource mobilization in a country experiencing rampart inflation or running a balance of payments deficit that generates expectation of some still unspecified type of policy intervention, be it devaluation, QR's or other type of trade restrictions. With regard to the balance of payment, therefore, we feel that the adjustment program must specifically address the correction of the problem even if it is not directly addressed to the trade sector.

II.2 The Role of Fiscal Deficits

Balance of payments problems are usually a symptom of more fundamental disequilibrium than a simple deterioration of the terms of trade or of access to foreign markets. If that were to be the case, there would be little adjustment the country could do to solve then. It is the case, however, that most perdurable balance of payments problem are the result of internal macroeconomic disequilibrium. They usually come together with other symptoms like high inflation and high fiscal deficits. They may also be the result of huge private capital inflows that foster aggregate demand and generate both inflation and current account deficits, as it was the case for many countries in the late 70's.

It is very unlikely, however, that a country "suffering" from large capital inflows will feel the need to start an economy wide structural adjustment effort. As a practical matter, therefore, most cases of structural adjustment will deal with situations where the balance of payments problems take place in a country where the excess spending is due mostly, if not uniquely, to internal conditions, among which we would single out the fiscal behavior of the government sector.

It is our view that fiscal deficits are the single most important factor determining the poor current account performance of the majority of countries implementing structural adjustment programs. While it would be possible that fiscal deficits be financed internally, this is not usually the case, at least over the medium run that is relevant for the implementation of adjustment programs. Internal financing of fiscal deficits is possible either through the issuance of more internal interest bearing debt or through the inflation tax. Regarding debt financing, it would be sustainable in the long run only if the real interest rate paid on the public debt falls short of the growth rate of the economy. While there might be exemptions, we do not feel this is likely to be the case for the type of countries in need of structural adjustment, where one of the main problems is the lack of capital in the economy. To show but one example, in the period 1982-1987, the compound real rate of interest in Argentina on first rate customers was 22% annual while the compound growth rate of GDP was a mere 1.4% annual. Under those circumstances, any amount of debt financing is an invitation for exponentially growing deficits on account of real interest on debt.

Inflation financing also has serious problems. A structural adjustment program should never accept a high inflation rate as a genuine form of long term financing. From a practical point of view we think that inflation, when used for revenue purposes, leads to high rates that quickly reach the three digit levels. At that rate, inflation turns highly unstable, variability of relative prices becomes a significant problem and the deficit itself grows as a consequence of lags in tax collection. High inflation countries, as the experience of several Latinoamerican countries shows, have the most unstable real sectors and show the poorest performance when compared with the availability of resources.

Some low rate of inflation, probably not in excess of 20% annual may still be compatible with structural adjustment from the point of view that it may turn out to be relatively stable, predictable and do not interfere much with resource allocation. While its elimination would still be desirable, it may not be an important obstacle to the implementation of structural

adjustments in the real sectors (it may still be a problem if the adjustment is to be in the financial or banking sector). Such an inflation experience may be exemplified with the case of Colombia, a country that has had a relatively stable inflation rate, ranging between 15% and 30% during the last 15 years, while being able to maintain a compound annual growth rate of real GDP of 4.3% during the same period.

It is the case, however, that the low rates of inflation compatible with structural adjustment are poor providers of fiscal revenue in comparison with the fiscal needs of these countries. In the case of Colombia, the velocity of circulation of Base Money has been around 10 during those 15 years. This means that an annual inflation of 20% would be able to finance a deficit of about 1.8% of GDP.2/

As a general rule, we propose to define the maximum acceptable deficit as the one that if financed solely through the inflation tax would generate an inflation rate that if sustained will be just compatible with the structural adjustment. If there is justifiable evidence that part of this deficit can be financed in a sustainable way through increases in the real levels of internal or external debt, the minimum deficit should be raised accordingly by this extra sustainable amount. Detailed quantification of these relations will be presented in Section V.

For most countries in need of structural adjustment, however, we feel that they probably have reached the limits for their access to capital markets (both internal and external) and that an optimist hypothesis is that at most they would be able to maintain their real levels of public indebtedness through a more or less automatic refinancing of the inflation component of the nominal interest burden. From that perspective, we think that a deficit figure that assumes automatic refinancing of the inflation component of the public debt should not exceed a level that would be consistent with a stable inflation rate of about 20% annual. Although such number should be subject to careful estimation in each particular case, we feel the Colombian estimate of 2% deficit as a fraction of GDP presented previously could be considered as a reasonable reference for the average of the countries involved in adjustment programs.

2/ The exact formulae used is : INF= V.(Def/GDP), where INF is the logarithmic inflation rate and V=10.The derivation of this expression will be presented in Section V.

In summary, large inflation adjusted fiscal deficits are likely to be incompatible with a successful adjustment effort, either because they generate balance of payments problems or unacceptable high rates of inflation. The alternative of financing the deficits with real increases in internal debt should be ruled out whenever the real interest rate on public debt exceeds the growth rate of the economy, as it is usually the case. The alternative of foreign financing, other than the automatic roll-over of the inflation component of the interest, also does not seem reasonable given the actual circumstances in the international capital markets regarding the problem with third world debt.

There is another argument against fiscal deficits in the context of adjustment programs aiming at resource mobilization, particularly trade and financial reform programs. In general, an economy with a high fiscal deficit is characterized by a little of each of the three bad effects we have mentioned above: current account deficit, high inflation and high real rates of interest as a result of the crowding out of the private sector in the credit market.

A trade reform program aims, among other things, at improving the current account balance. This objective can never be obtained unless absorption is reduced relative to income. The maintenance of the fiscal deficit implies that all the expenditure reduction effort should fall on the private sector, something hard to obtain in these economies usually already overburdened by overgrown public sectors. In consequence, it will be very difficult for resources to be freed so that they can move to the traded sector of the economy. If that is the case, the price incentive effects usually associated with trade reform will not be effective, as there will be no net resources to be shifted into the traded sector for the generation of a trade surplus. In consequence, the price incentives are more likely to result in higher inflation(if there is real devaluation) of just more imports (if there is tariff reduction or reduction of import quotas) without resources moving into the export sector.

Similarly, to the extent that the government's borrowing generates high real rates of interest, normally in excess of the productivity of investment, and the fact that the government is usually willing to continue its financing at whatever level such rates take, may imply that lending to the government will systematically be the most attractive option in the market. Therefore, it is likely that any effort to increase private savings through financial reform may end up in those extra savings being channeled to the government who may find an opportunity to finance through the improved capital market a

larger fraction of its deficit. In summary, if the objective of
the financial reform is to foster private savings and channel
those resources to productive private investment, ceilings must
be imposed as to the use of those resources by the public sector.

     Even in the case of public sector borrowing ceilings, the
deficit will continue crowding out private investment either
through the demonetization due to the inflation tax or by using a
larger fraction of the country limits imposed on the available
external credit.

     In summary, we find that large inflation adjusted fiscal
deficits are a serious obstacle to structural adjustment by
contributing to current account deficits, high real rates of
interest, crowding out of productive private investment and,
finally, contributing to generate high rates of inflation that in
turn seriously distort the efficient allocation of resources. For
all of the above we feel that inflation adjusted deficit targets
compatible with a reasonable inflation rate and sustainable rates
of public borrowing should be an essential ingredient in the
design of the structural adjustment programs.

II.3 Public Debt and the Real Rate of Interest

     A related point has to do with whether to accept as reasonable
any existing level of internal public debt from the perspective
of the effects it may have on the real cost of credit to the
private sector. In an economy open to international capital
markets, private access to credit is independent of the rate of
government borrowing, as any difference between credit demand and
internal supply will be covered by capital inflows at the
international interest rate. Assuming Purchasing Power Parity
over the medium term, capital inflows will thus tend to equalize
the domestic real interest rate with the international. We may
assume that the international real cost of credit is the best
alternative open to a capital importing country. In this
scenario, therefore, the level of the real internal public debt
is irrelevant for the determination of the real cost of credit.

     Since the early 80's, new flows of capital to developing
countries have all but disappeared and the only significant flows
remaining are those coming from multilateral institutions that
are mostly devoted to the refinancing of external interest owed
to private creditors. From a practical point of view, therefore,
it is better to proceed with the assumption that there is no
access to new international borrowing for the typical LDC in need

of an adjustment program.

Under those circumstances, the real interest rate is determined by the supply and demand for internal credit in the country in question. The level of internal government debt becomes therefore an important determinant of the real cost of credit. We know that in many countries this real interest rate reaches levels that far exceed the productivity of investment and as a consequence structural adjustment becomes all but impossible to implement. It is difficult to ascertain the precise quantitative effects of public debt on the real interest rate for a single country (the issue is still highly debated even in the U.S. economy) and much more to derive a general rule applicable to the group of countries in need of structural adjustment.

As a general rule we propose that the government should not borrow more, relative to the private sector, than the share the government sector represents in the economy. This criteria clearly defines the maximum admissible level of public debt. In some cases it will be hardly possible to determine the total size of the internal credit market as much of the credit runs through non-institutionalized channels. In part, this is precisely the effects of the financial repression generated by an excessive rate of government borrowing. Under those circumstances, the least that can be done is to place limits to the access of government to the still existing institutional channels. For example, commercial bank credit is an important source of credit and easy to measure. Governments tend to tapper this market through several channels, including reserve requirements, compulsory deposits, direct sales of public debt to commercial banks, operations of national or provincial banks, etc. A ceiling of total government debt to the banking system can be easily imposed therefore assuring that some funds remain accessible to the financing of private sector investments.

We see, therefore, that in some cases, not only real public debt should not be allowed to increase but it may be required for it to be reduced if it is seen to be a factor in generating real interest rates in excess of the productivity of investment. For those cases, the program must plan for the generation of government surpluses aiming at the reduction of the stock of public debt. While this requirement may sound as extremely ambitious, it should be noticed that the essential aspect of structural adjustment is productive resource mobilization in the private sector and that this will hardly happen when the real cost of credit exceeds the productivity of investment.

For all of the above, we feel that another objective in structural adjustment programs should be the attainment of well defined targets for the real value of public debt. This may mean that for some time, the actual deficit may have to be below what is regarded as the sustainable deficit rate and may even have to turn into a surplus until public debt reaches what is considered to be the sustainable level.

II.4   Real Exchange Rate Aspects of Trade Reform

Most of adjustment programs aim at some form of trade expansion oriented reforms. On a priori basis it is impossible to say what is the optimal level of foreign trade of an economy. In general, we know that the optimal level of trade depends on country specific variables like size, factor proportions, technology, location, etc..The actual level of trade, in turn, is determined by the above factors plus the whole set of intervention in the related markets, both as a result of domestic or foreign policies.

Granted that trade expansion is an important objective into the structural adjustment programs, the question is what are the essential macroeconomic ingredients required for it to be successful. We must here distinguish between those adjustments aiming at trade expansion and those calling for an improvement in the Trade Balance. As we have seen before, the Trade Balance is the result of a difference between income and expenditure on goods and services and as such is essentially a macroeconomic phenomenon determined by macroeconomic variables, among which we find the fiscal deficit to be the most relevant one. Very open economies may have Trade Deficits (like the U.S.) or Trade Surpluses (like Germany) that are mostly determined by fiscal results and private capital flows. On the other hand, very closed economies may have Trade Surpluses (Argentina 1982-87) or Trade Deficits (Argentina 1979-81).

All of the above seem to suggest that there is no relation between the degree of openness and the net results of trade as measured by the Trade Surplus. This is true in the medium run but not necessarily so in the short run, particularly in the face of ongoing trade liberalization reforms.

Trade liberalization reforms, as instrumented in the adjustment programs rely mainly on two mechanisms: export

promotion and import liberalization. These two mechanisms are, however, but two faces of the same coin. If the Trade Surplus, the difference between exports and imports, is determined by macroeconomic factors, any price incentives given to the expansion of imports must result in more imports and more exports. Similarly, incentives to export expansion, if successful must imply that imports have also increased in a proportional amount.

The simple fact that unless income and absorption are varied, imports and exports will tend to move together has been systematically ignored by development strategies that relied on import substitution as a way to solve developing countries chronic shortages of foreign exchange. Perhaps the best example of this type of policy is represented by the Argentine experience during this century with import substitution. In 1920, when there were little impediments to foreign trade, imports were about equal to exports and either represented about 37% of GDP. In 1975, after the process of import substitution had been completed, exports were again about equal to imports but now each represented only 9.3% of GDP or about one fourth of what they originally were. The end result of import substitution was not to reduce the country's shortages of foreign exchange, as measured by a tendency to generate trade deficits, but to reduce the level of international trade as measured by either exports or imports.

Since import liberalization is the dual problem of import substitution, it can be expected that the end result of the import liberalization process should be an expansion in exports. For that to happen, however, exporters must receive the adequate price incentive in the form of a higher real exchange rate. The raise in the real exchange rate in the face of import liberalization is inevitable if the economy is to reach macroeconomic equilibrium. Otherwise, imports will increase and the extra foreign exchange will have to come either from Reserves or from capital inflows. In general, we cannot consider either one of the above as a permanent source of import financing. In consequence, either the real exchange rate is allowed to increase in the process of import liberalization or the economy will be bound to a balance of payments crisis.

From the previous discussion we conclude that real exchange rate adjustment is an essential element in a program of trade liberalization. Such adjustment may be incorporated into the program by means of the specification of required nominal exchange rate adjustments or be left to be done by market forces. In the later case, the nominal exchange rate adjustment will be quickly done if there is a freely floating foreign exchange market. For practical purposes, however, we do not feel this case

is likely to happen since the overwhelming majority of Central
Banks in LDC's intervene into the determination of the price of
foreign exchange. In this last scenario, unless the real price of
foreign exchange is adjusted by authorities to what is needed by
the trade reform, the adjustment may be long and costly in terms
of unemployed resources or unnecessary inflation and may lead to
short run macroeconomic imbalances that may induce the
abandonment of the reform program. Much can be gained, therefore,
by stipulating targets on both the path of the real
exchange rate as well as the rest of instruments of the program.

Macroeconomic adjustments other than trade reform may also
require changes in the equilibrium value of the real exchange
rate (this being defined as the internal relative price of
tradables vs.non-tradables). In particular, those changes that
require a new equilibrium level for the Trade Account. Any
macroeconomic action determining a change in the level of the
excess supply (or demand) for tradable goods must be accompanied
by a change in the relative price of those goods so that the
resources receive the correct price signal in order to shift
toward this sector. For example, an improvement in the fiscal
deficit is likely to free resources for them to move to the
traded sector. For this to happen, however, the relative price of
traded goods must increase, which means that there is a new,
higher, equilibrium real exchange rate.

In Section III we will discuss the required real exchange
rate adjustment in much more detail as there are several problems
arising from the operational difficulties in measuring this
variable as well as specifying the required changes in the face
of adjustments in the wide variety of commercial policy
instruments that form part of a trade liberalization effort. We
shall also discuss in detail the required adjustments in the Real
Exchange Rate in the face of changes in aggregate levels of
income and expenditure of the country such as those that may
happen during an adjustment program aiming at a modification in
the level of the Trade Balance. In the Appendix we discuss some
additional issues involved in the choice of import substitution
vs. export promotion.

II.5 Fiscal Aspects of Structural Adjustment

Structural adjustment relies heavily on microeconomic
measures aimed at a better allocation of resources.Some of these
measures include reduction in levels of taxes or of controlled
prices. In some cases, the elimination of this restrictions to
resource allocation may have important effects on fiscal revenue

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and therefore contribute to the generation of macroeconomic
disequilibrium that may eventually put in danger the reform
itself.In those cases it is important that if a microeconomic
measure is to deprive the treasury from revenues, the program
must stipulate alternative fiscal measures to deal with this
problem. Either expenditures will have to be cut elsewhere or
some other form of financing should be incorporated into the
program.

The general tenor here is the same stated in the introduction: a
structural reform is made to last for many years, and this will
only happen if it includes all the supporting measures for it to
be financially viable. To reduce export taxes when export prices
have fallen is easy to implement as the government would have
done so anyway. The problem is to establish credible conditions
in the adjustment program so that the same government does not
rise the taxes when export prices go back up again. We will now
discuss some cases we consider relevant in the sense of being
microeconomic measures that have a fiscal impact that, if not
addressed, may contribute to the generation of macroeconomic
disequilibria.

(a) Fiscal Aspects of Financial Reform

Several adjustment programs aim at a better allocation of
resources in the financial and banking sectors. Aside from
specific microeconomic adjustments, one key element present in
several of this programs has been the need of greater flexibility
in the process of determination of interest rates. A common
problem found in LDC' is that interest rates tend to be subject
to government control, a situation that in some cases leads to
negative real interest rates and the subsequent need to ration
the small amount of credit available among the large demand for
it.

The control of interest rates has important macroeconomic
implications specially in high inflation countries where the
interest rate tends to be considered as an element contributing
to the rise in prices. Nominal interest rates tend to be
controlled at levels that produce substantially low real rates
and as a consequence the supply of funds to the institutionalized
system is drastically reduced. The resultant demonetization
restricts the supply of credit and produces the need to ration
it. As in any other rationing situation, the one doing the
rationing has a tendency to get the better part for himself. In
this case, with credit being rationed there is a tendency for the
government to get the better part of it. Credit rationing,

therefore, induces an tendency for unduly increases in the level of public debt as well as very stringent conditions for the financing of private investment.

With the government debt already at high levels, the liberalization of interest rates is likely to produce an important fiscal imbalance. Sure enough, liberalization of the interest rates will increase the rates in the institutionalized sector but reduce them in the non-institutionalized sector. The problem is that government debt is usually placed in the institutionalized sector. The fact must be faced that the government was financing its expenditures through the equivalent of a tax on the capital market and that liberalization has the effect of eliminating that tax. Provisions must be made therefore for alternative sources of revenue or for reductions in expenditure. Lack of fiscal adjustment may imply that the government will continue refinancing its existing debt at the now positive real rates with the consequence of generating an explosive situation in which internal real public debt starts growing without bounds. Very soon we might find the whole of the credit in the now free institutionalized system being devoted totally to the financing of the government deficit.

One interesting alternative in the above problem is that if passive (borrowing) rates become positive in real terms, there will be an increase in the demand for base money that usually accompanies the resulting increase in monetization of the economy.The alternative is open for the Central Bank to provide the extra money demanded in exchange for outstanding public debt. In this way, at least part of the fiscal problem created by the high real interest cost on the public debt will be reduced as there will be less debt outstanding.

(b) Fiscal Aspects of Trade Reform

Two key elements in Trade Reform have been the reduction of import duties and of quantity controls whenever there is foreign exchange rationing.Let us consider first the fiscal effects of reducing import duties in the absence of foreign exchange rationing.

Some countries use duties strictly for protective purposes.In those countries one is likely to find very high, up to the prohibitive level, duties on goods that have domestic production (and there are very few imports of these goods) and

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very low or zero duties for imports of goods not domestically produced, mainly inputs and raw materials. In this case reduction of the high duties is likely to result in more fiscal revenue as it will also be the case if the low duties are increased. In this case there are no obvious fiscal constraints working against a move towards unification of duties at some intermediate level.

Different is the case in countries that rely heavily on import duties as a source of fiscal revenue.These countries tend to have a more uniform structure of tariff rates and any reduction in the average tariff level is likely to generate some significant fiscal imbalance.

Some countries also rely heavily on export taxes, mainly on traditional exports. Moreover, these taxes are used normally countercyclically, meaning that the tax is raised when the foreign price increases therefore giving the producer the wrong information as to in what direction to allocate his resources.

Export taxes are extremely damaging for resource allocation, not only giving the wrong information to producers but, by taxing value added, they induce the use of less variable inputs, contributing to the technological backwardness of this traditional sectors. Trade reform programs often aim at the reduction or elimination of export taxes but their implementation is strongly opposed on fiscal grounds. As in the other cases discussed above, therefore, it is fundamental that the reform package include new fiscal alternatives to the duties or taxes being reduced. Land taxes or economy wide consumption taxes come out as ideal alternatives.

A second problem comes about when there are import quotas or foreign exchange rationing in operation. It may happen that the adjustment program calls for tariff reductions on products that are still subject to import quotas. If the import quota is not increased, the domestic price should not change even in the face of a lower tariff. In consequence, what takes place is a shift in tariff revenue from the Customs to the importer that is lucky enough to hold the import quota.In this case, we have a tariff reduction that produces a fiscal problem and serves no purpose as resource allocation is not improved.

(c) Fiscal Aspects of Multiple Exchange Rates

Many countries use multiple exchange rates as an additional form of taxing exports and subsidize the import competing sector.

The advantages of this mechanism are exclusively political as this measures do not normally require approval by Congress and provide a flexible source of revenue to the Treasury. The rates can also be easily modified by decision of the Central Bank. Form an economic point of view, those advantages turn into disadvantages. The first requisite for Commercial Policy instruments is that they be stable over time and respond to an agreed criteria for resource allocation.

Multiple exchange rates, however, are usually imposed as short term forms of getting additional financing to the Treasury. In doing so they violate the rule of stability of trade taxes and also significantly obscure the functioning of the foreign exchange market. Being subject to the discretional management of Central Bank authorities they become an easy source of granting of privileges and they quickly degenerate into a system of mixes where the rate of each product is determined as a mix of the different rates that exists. As the mixes are negotiated on a case by case basis, the system leads towards a situation in which each producer gets the rate that precisely eliminates foreign competition. In essence, the Central Bank ends up instrumenting a system of made to measure tariffs and export subsidies and taxes that brings the economy closer to autarky.

In unifying exchange rates, care must be taken about the net revenues that the multiple rates may be producing to the Central Bank. Normally, the Central Bank tends to buy cheap from traditional exporters and sell more expensive to importers. If the rates are unified, the revenue from operation in foreign exchange will disappear and additional sources of revenue must be designed into the program.

II.6 Macroeconomic Policies and Economic Growth

One of the main purposes of structural adjustment is to create conditions favorable to the attainment of a high and sustainable rate of growth. As we have seen, macroeconomic stability is as an essential ingredient for adjustment to be successful and therefore it is a contributing factor to growth. It is also the case that it is very difficult for growth to take place in the presence of an unstable macroeconomic environment. In other words, the set of policies we have described as contributing to a stable macroeconomic environment is also required for growth to take place.

In general terms, we do not recommend the use of specific macroeconomic policies for promoting growth to the extent that these may interfere with efficient resource allocation. More specifically, we feel that given a stable macroeconomic environment and the correct microeconomic incentives, resources will be allocated to their most productive use without need for additional macroeconomic incentives, such as subsidized credit or an arbitrarily high real exchange rate.

It is the case, however, that government spending may crowd out private spending, and investment in particular, unless it is fully financed abroad. This fact is not enough to make a case against any government spending that will be done at the expense of private investment as the productivity of the former may be higher than that of the later. This will certainly be the case of government spending aimed at providing the basic infrastructure needed for markets to operate. For other types of spending we can only recommend a careful evaluation and comparison of social rates of return both of the new activities as well as of the displaced activities.

We are aware that permanent evaluation on all types of government investments is quite difficult to obtain and that investment is also crowded out by current government spending. In those circumstances, real interest rates may provide some indication of the actual degree of crowding out in the capital markets due to government spending, at least in the case when it is debt financed. It is the case that excessive borrowing on the part of the public sector is likely to produce real interest rates in excess of the productivity of capital. In this case growth is bound to suffer as investments are curtailed. As a general rule to avoid this situation we recommend that ceilings be imposed on rates of government borrowing. Unless a special case is made for the higher productivity of public investment to be financed by the incremental borrowing, we suggest that government borrowing as a fraction of total savings should not exceed the share of government in the generation of GDP.

Other macroeconomic instruments that are often present in the discussion of growth oriented policies are the real interest rates and the real exchange rate. Both are endogenous variables and we do not recommend policies aiming at keeping them away from their equilibrium values, even for the purposes of fostering growth. For example, growth is best served by a well functioning capital market and this is best obtained when governments do not try to interfere by controlling interest rates at below than equilibrium levels.

It is also the case that there cannot be investment without savings, be they domestic or foreign. A well functioning financial system is the best way to promote domestic savings, and in this context we feel that a stable inflation rate, freedom of determination of interest rates and convertibility of the currency are essential ingredients to this end.

III. THE REAL EXCHANGE RATE

III.1-The Theoretical Background

We have already seen that the Real Exchange Rate is a key macroeconomic variable in the process of structural adjustment. There is however, no uniformly agreed definition of what the real exchange rate is, nor on what is the process generating the equilibrium level for this elusive variable.

Theoretical models (in the Salter tradition) define the real exchange rate as the relative price between traded and non-traded goods. This type of measure is appropriate for defining the relative price that tends to equilibrate the market for non-traded goods, therefore allowing the economy to attain internal balance without inflationary or deflationary pressures. Other measures, however, attempt to capture some indication of the evolution of foreign versus domestic prices or costs. The idea behind this last type of measures being that, if over a period prices in domestic currency have risen faster than foreign prices, a devaluation is called for in order to restore international competitiveness.

It is not clear what is the justification for the latter type of measure. Apparently, the basic idea would be that all prices in domestic currency can get out of line with foreign prices when converted at the prevailing nominal exchange rate. In this type of scenario, arbitrage in the markets for internationally traded goods would not exist. In other words, this measurement assumes that there is no automatic mechanism for obtaining Purchasing Power Parity at the level of traded goods and that the nominal exchange rate should be adjusted in order for PPP to be attained. If this is the case, however, it is difficult to see how a single variable, the nominal exchange rate, can be used to restore parity between the several thousand of international traded goods that enter into a country's trade. The most that could be done is to attain some type of "average PPP" between broadly defined categories of goods.

From a fundamental point of view, we can say that if PPP does not hold it may be because there are quantitative distortions in the several markets comprising the traded sector. Under these circumstances, it is not clear whether the nominal exchange rate that would yield some degree of "average PPP" would also be the

one being consistent with internal balance and an optimal allocation of resources. The problem, therefore, is one of too many targets and only one instrument, the nominal exchange rate.

If there are quantity restrictions to international trade, the proper policy assignment should be to eliminate those restrictions whenever possible. If they cannot be eliminated, optimum resource allocation requires that the goods subject to those restrictions should have internal prices different from the international prices in order to reflect the additional scarcity or abundance value implied by the binding quantity restriction. Attempts to use the nominal exchange rate in order to make the internal prices of some goods more similar to their international prices would do so in detriment of resource allocation and welfare.

Another source of deviation from PPP may be the existence of time lags in the actual process of conducting international trade. Increases in the domestic price of import competing goods may not be associated with an immediate flow of imports bringing the price back to PPP. This effect is at the heart of the "price-specie flow" adjustment mechanism described by David Hume. In Hume's view, price differentials are the main signals for trade flows that redistribute money supplies and eventually lead back to PPP. In this context, a devaluation in the country that has the excess supply of money will restore equilibrium by convalidating the higher domestic prices without need for trade flows to take place.

In Hume's model all prices of goods, traded and non-traded, would be above long run equilibrium given an increase in the money supply and an unchanged exchange rate, the reason being that there is an excess supply of money in the economy that is immediately eliminated through an increase in prices. In this context, the proper policy would be to devalue in proportion to the excess supply of money and the price differential is precisely capturing this magnitude. If,however, adjustment to PPP is fast while financial markets adjust slowly, a comparison of price indexes at a point in time will not give an indication of the correct amount of devaluation needed.

To illustrate the above point consider the extreme example based on the adjustment mechanism of "income-absorption" of Alexander or the more general "income-expenditure" that constitutes the basis of the adjustment process under the "monetary approach to the balance of payments". Assume a situation where all goods are traded and there is instantaneous

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PPP. Assume the quantity of local money is doubled and that the public plans to spend 1/10 of the excess supply per unit of time. This will lead to a trajectory of trade deficits lasting until reserves are depleted to that level that restores the money supply to the original level. At no moment a comparison of price indexes will give any hint that there is a potential need for a devaluation, as domestic prices will remain always in line with international prices.

In the last two examples, there was need for a corrective devaluation but only in one of them did the international price comparison provide the right orientation. In both cases, however, there was a trade deficit unwanted by the authorities. The trade deficit, in turn, was the counterpart of the excess supply of money.

The analysis gets more complicated when we allow for non-traded goods and incorporate the Salter measure of the relative price of traded vs.non-traded goods into the picture. A change in the composition of expenditure within the country may require a change in the relative price of traded versus non-traded goods in order to restore equilibrium. This may be achieved by means of a change in the nominal exchange rate and an accommodating adjustment in the level of the nominal quantity of money, or, alternatively, by just allowing the nominal price of non-traded goods to find its new equilibrium level. In this last case, if authorities devalue in proportion to international differences in aggregate price indexes, they may be induced to devalue whenever an expenditure shift requires an increase in the relative price of non-traded goods. In doing so, authorities will in effect be preventing the relative price adjustment to take place and contributing to market disequilibrium.

From a practical point of view, we feel the most likely case when PPP does not hold is when there are quantity constraints. In that case we have seen that there is no argument for exchange rate correction as the deviation from PPP should reflect the scarcity or abundance of the different goods created by the QR's. We are therefore left with two cases of need for nominal exchange rate adjustment (1) global excess demand for goods in response to excess supply of money that will only be partially reflected in a comparison of global price indexes; (2) changes in the relative price of traded vs.non-traded goods due to expenditure switching.

In either case we do not think there is a quantitative measure of a real exchange rate such that keeping its level constant can

be the objective for the nominal exchange rate policy.

As we have seen, the real exchange rate, defined as the relative price of traded vs.nontraded goods, changes in response to variations in the level of expenditures relative to income or in response to expenditures switching among categories of goods.

The objective of nominal exchange rate policy should be to anticipate those changes and implement them through variations in the nominal exchange rate rather than allowing costly variations in the level of non-traded goods prices. In order to do so we need a model for the determination of the equilibrium level of the real exchange rate allowing to identify the required changes in this variable.

A second related problem is that of obtaining a practical definition, for policy purposes, of the real exchange rate.This implies obtaining meaningful series for the prices of traded and non-traded goods so that the real exchange rate series so constructed can be predicted from the theoretical model and at the same time its construction is not subject to undue lags due to data collection or arbitrariety due to the lack of a precise definition about what time series are to be used for the construction.

In Section III.2 we develop a simple general equilibrium model that indicates what should be expected from a Real Exchange Rate measure for it to be useful for policy purposes and what are the factors determining its equilibrium level.

III.2 A Model Determining the Real Exchange Rate

Consider an economy producing three types of goods: Exportable(E), Import Competing(I) and Non-Traded(N), whose prices in domestic currency are, respectively: Pe , Pi , and Ph. Equilibrium in the market for Traded Goods (the E and I goods) requires that the excess supply of these goods (the Trade Balance Surplus) be equal to the excess demand for foreign assets (the Capital Account deficit plus changes in International Reserves) plus the payments on Foreign Factor Services (the Service Account deficit). We can see that the Current Account and the Trade Account are directly related to the Service and Accumulation of Foreign Assets and as such they must be determined by those variables that affect that fraction of national savings oriented towards foreign assets. We will come back to those factors in the next Section.

Equilibrium in the market for Non-Traded goods requires that their supply be equal to their demand. Their nominal price, Ph is the natural variable through which this equilibrium is attained. However, a change in the nominal price of the NTG can also be interpreted as a change in the relative price of the NTG in terms of the Traded Goods. Here is were the concept of the Real Exchange Rate appears. To define it, we need first to define an appropriate index of prices of Traded Goods (Pt). In order to do so let us look in more detail into the determination of equilibrium in the market for the Non-Traded Good.

The supply of the NTG can be represented as a function of the three nominal prices and nominal GDP:

(1) $Qh = Qh(Px , Pi , Ph , GDP)$

The above function must be homogeneous of degree zero in all nominal variables since a proportional increase in all nominal prices and GDP would leave real quantities, and Qh, unaltered. This means we can divide all arguments in the right hand side of (1) by any number (different from zero) without any significant change taking place. Choosing Ph as the common deflator we obtain:

(2) $Qh = Qh (Px/Ph , Pi/Ph , GDP/Ph)$

Let us assume that the share of output of Qh in GDP depends only on relative prices. This implies the following form for (2):

(3) $Qh = qh[Px/Ph,Pi/Ph]*(GDP/Ph)$

In (3), $qh[.]$ represents the share of Qh in GDP. It depends on the relative price of E in terms of H and on the relative price of I in terms of H. The real exchange rate is supposed to be the relative price of both traded goods in terms of H, whereas, in (3) we see that what really matters is the relative price of each traded good in terms of H. In general, we can affirm that the Real Exchange Rate concept lacks meaning unless the relative price of the two traded goods (the Terms of Trade, corrected for taxes or subsidies) is taken into account.

Consider an arbitrary price index of the domestic currency price of the two traded goods :

(4) $Pt = F(Pe , Pi)$, homogeneous of degree 1 in both arguments, so that it can be represented by:

(5) $Pt = Pi*f(Pe/Pi) = Pi*f(T)$, where $T=Pe/Pi$ is the terms of trade measured by internal prices (therefore incorporating whatever measures of commercial policy that makes them differ from international prices).

Going back to (3), we can divide and multiply each of the relative prices in this expression by Pt and obtain:

(6) $Qh = qh [(Pi/Ph)*Pt/Pi*f(T) , (Pe/Ph)*Pt/Pi*f(T)]*(GDP/Ph)$

Denote the Real Exchange Rate as :

(7) $e = Pt/Ph$

Substituting (7) into (6) and rearranging terms:

(8) $Qh = qh [e/f(T) , e*T/f(T)]*(GDP/Ph)$

Or, in more general terms:

(9) $Qh = qh(e, T)*(GDP/Ph)$.

        In general one would expect a non-positive sign on the
effect of e on Qh and an ambiguous sign with respect to T. This
should not bother us since those signs will be empirically tested
later in this Section.

        The treatment of the Demand side is similar to that of the
supply, except that demand for the Non-Traded Good (Ch) should
not depend on GDP, that is the value of domestic production of
goods, but on Absorption, that is the value of domestic
expenditure on goods. Denoting absorption by A, we can express
the demand for Ch as:

(10) $Ch = ch(e, T)*(A/ph)$

        We finally use the basic national accounts relationship, that
gives rise to Alexander's Absorption Approach:

(11) $GDP = A + TS$,where TS is the Trade Surplus.

        Market equilibrium requires the equality of Qh and Ch:

(12) $Qh = Ch$

        Substituting (9),(10) and (11) into (12) we obtain:

(13) $qh(e,T)*(GDP/Ph) = ch(e,T)*(GDP-TS)/Ph$

        Finally, denominating ts= TS/GDP to the ratio of the Trade
Surplus to GDP, we obtain:

(14) $qh(e,T) = ch(e,T)*(1-ts)$.

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The above expression shows the relationship required for market equilibrium between the Real Exchange Rate, the Terms of Trade and the Trade Surplus(normalized by GDP). In explicit form, this expression implies a functional relation between e and T and ts:

(15)   e = e(T , ts).

In general one would expect that a higher Trade Surplus will require a higher Real Exchange Rate. The relation between T and e is ambiguous not only on theoretical grounds (depending on relations of substitution or complementarity between goods) but also because of the arbitrary index of prices of traded goods we have chosen.

Equation (15) tells us that for any arbitrary index Pt there is a relation between the Real Exchange Rate constructed using that index and the Trade Surplus. The shape, and even the sign of this relation, however, may change depending on the index being used.

In practice, the problem of constructing the Real Exchange Rate is more complex than what we have seen so far. In fact, there is no such clear classification of three goods in the real world and therefore the criteria for aggregation is left in the hands of the one constructing the index. This is not a trivial problem. In general, the numerator of the Real Exchange Rate includes the Nominal Exchange Rate and some aggregate of international prices. In many countries,monetary authorities use the level of the Real Exchange Rate as a way to obtain indication of what the nominal exchange rate should be. This implies that they devalue in proportion to the difference between the rate of change in the index of international prices they use and a measure of Non-Traded goods prices . Therefore, the election of the basket of international prices and of the domestic prices representative of non-traded goods is of crucial importance.

In an economy where authorities follow a crawling peg policy based on some RER concept there are two problems:

(a) Constructing a meaningful aggregate for the Real Exchange Rate. By meaningfull we mean that this aggregate must have some relationship with the Terms of Trade and the Trade Balance. Choosing to stabilize the relative price of Newsweek Magazine (Traded) in terms of Taxi Fares (Non-Traded) may easy the problem of constructing a more comprehensive Real Exchange Rate but certainly it will be a very long time before the stabilization of

this relative price is able to generate Home Goods Market
equilibrium; in the meantime the Nominal Exchange Rate may take
absurd values given conditions prevailing in the rest of the
economy. We propose that for crawling peg purposes, the Real
Exchange Rate must be empirically related to the Terms of Trade
and the Trade Balance, as the theoretical relation (15)
indicates. In practice this implies choosing the Real Exchange
Rate concept that shows the best statistical fit between itself
and T and ts.

(b) Assuming one finds the proper measure of the Real
Exchange Rate one has now the problem of finding the equilibrium
value, to the maintenance of which the Nominal Exchange Rate
policy will be oriented through the crawl. It is usual practice
to choose one particular level (say 112) for the Real Exchange
Rate being measured and manage the nominal rate in order to keep
that Real Exchange Rate constant through time at the chosen
level.

We suggest that the equilibrium value of the Real Exchange
Rate should be the value predicted by the empirical estimation of
equation (15). Since both T and ts are bound to change through
time, the equilibrium value of the Real Exchange Rate will also
change. This implies that the target level of the crawling peg
should not be a fixed level of the Real Exchange Rate but it
should follow its equilibrium value,a value that may change
through time. Changes in the Terms of Trade or in the level of
the Trade Account should demand corrective changes in the Nominal
Exchange Rate if the objective of the crawl is to keep the Real
Exchange Rate in equilibrium without need for the adjustment to
take place through changes in Non-Traded goods prices.

III.3 Empirical Analysis

In what follows we will try to illustrate the problems
involved with the measurement and the estimation of the
equilibrium level of the real exchange rate. We do not intend
here to provide an extensive empirical analysis on what the
correct measure of the real exchange rate should be or what
should be the precise empirical form of the structural equation
determining its equilibrium value. Rather, we have chosen to
illustrate with the help of data from a few countries what are
the main problems to be encountered. Those problems can be
divided into two: those related to the prices to be used in the
construction of the Real Exchange Rate and those related to the
determination of the equilibrium value for the variable so
constructed.

Basically, there are two competing measures of Real Exchange Rates. They differ on the series used to represent the prices of traded goods. One uses a weighted sum of partner country's price indexes converted into the domestic currency by means of the bilateral exchange rates. This number is then deflated by the home country CPI in order to get the Real Exchange Rate. We denote this version as the CPI Basket Real Exchange Rate(CPIB). This measure is constructed by most country's monetary authorities and is widely used as indicator for the design of nominal exchange rate policy. The weights used are generally the shares of each country in the home country's trade in a base year.

The second measure tries to capture directly the domestic currency prices of the goods that are actually traded by the home country. One way of doing it is by obtaining the dollar prices of those goods and multiplying them by the exchange rate between the domestic currency and the dollar. The different foreign traded goods prices are then aggregated by use of weights representing the share of each product in the country's trade. This measure is imperfect as it ignores the effect on domestic prices of traded goods of commercial policy. The alternative is to use series of domestiuc currency prices of traded goods.

The following hypothetical example will help in identifying the fundamental differences between both measures. Assume Argentina exports all of its wheat to Uganda. Also assume Argentina is pegged to the dollar and that Uganda's currency floats vis a vis the dollar. Assume the dollar experiences a devaluation versus the currency of Uganda and that at the same time the dollar price of wheat falls in dollar terms. Since Argentina pegs to the dollar, its currency has devalued against Uganda's currency. Therefore, the cost of living in Uganda measured in Argentine Australes has risen. The CPI basket measure of the Real Exchange Rate of Argentina must have risen, implying a real devaluation. However, it turns out that the price of wheat is not determined in Uganda but in the world market and we have assumed it fell in dollars. This means that the Real Exchange Rate using the actual prices of traded goods must have fallen, implying a real appreciation. In this particular example, both measures of the Real Exchange Rate change in the opposite direction. If Argentina were to index its nominal exchange rate to mantain some level of the Real Exchange Rate, it would have to revalue if it used the CPI Basket version or devalue if it used the Traded Goods Prices version(TGP).

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The above example is not unrealistic. In the last few years the dollar cost of living of Argentina's main trading partners has significantly risen as a consequence of the U.S. dollar devaluation. However, during these same years, the dollar prices of the commodities Argentina exports and imports have fallen in nominal terms when measured in dollars. For this particular situation, if the objective were to be that of maintaining constant the price of home goods, the argentine currency should have been devalued versus the dollar as recommended by the Real Exchange Rate measure using actual traded goods prices. The Real Exchange Rate using baskets of CPI's would have wrongly recommended revaluation of the currency

The experience of Argentina is not different from that of many other countries. The fact is that the sharp movements in the value of the dollar were not accompanied by movements in the opposite direction in dollar prices of internationally traded goods. This is particularly the case for those countries trading mainly in commodities. Between 1983 and 1986, the dollar prices of commodities, measured by the IMF Index of Commodity Prices, has moved in the same direction as the value of the U.S.Dollar, measured by the MIRM Effective Exchange Rate for the Dollar. This fact can be clearly appreciated in Figure 1.

FIGURE III.1

DOLLAR VALUE AND COMMODITY PRICES
(Quarterly.1975.1=1)

□ Dollar Effec.Rate   + Commodity Prices
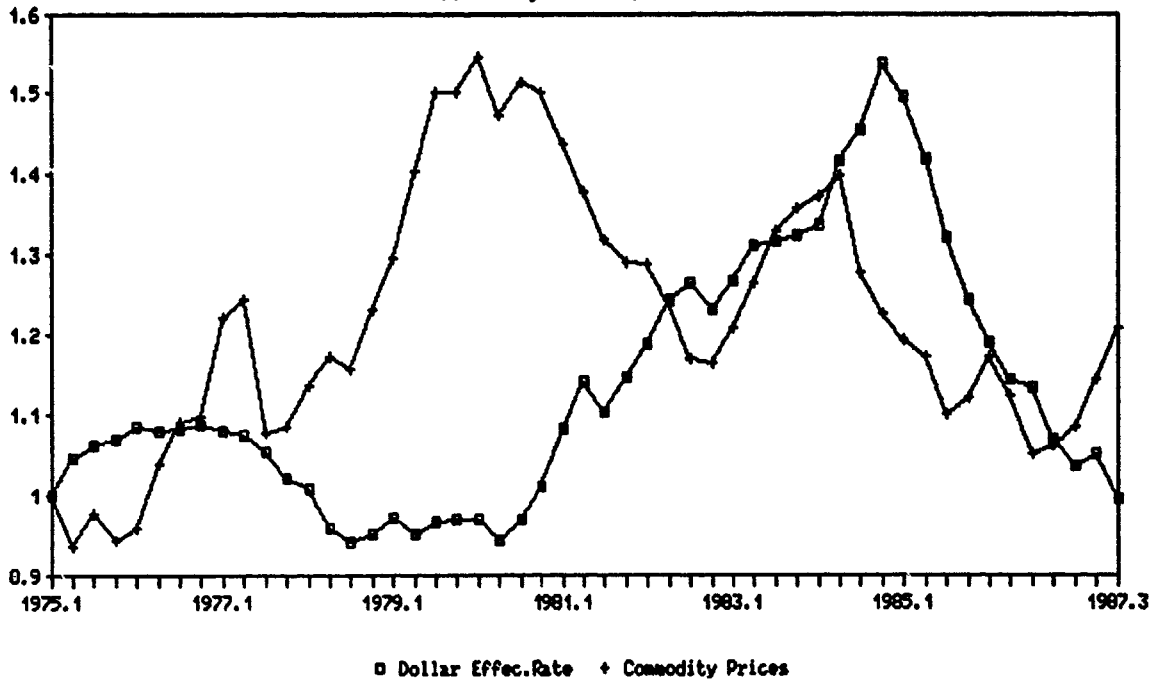
     The U.S.A. is no exemption to the points made above. Although the dollar devaluations helped a lot in making tourism more expensive for americans,this being measured by the weighted sum of CPI's converted into dollars, it was not so much successful in increasing the dollar prices of U.S. traded goods. Figure 2 shows the two measures of international prices we have been discussing:the CPI's weighted basket(obtained from IMF Information Notice System) and the index of USA traded goods prices (constructed as a logarithmic index of USA unit exports and imports values with equal weights).

FIGURE III.2
ALTERNATIVE MEASURES OF FOREIGN PRICES
(In U.S.Dollars.Base 1975.I=1)
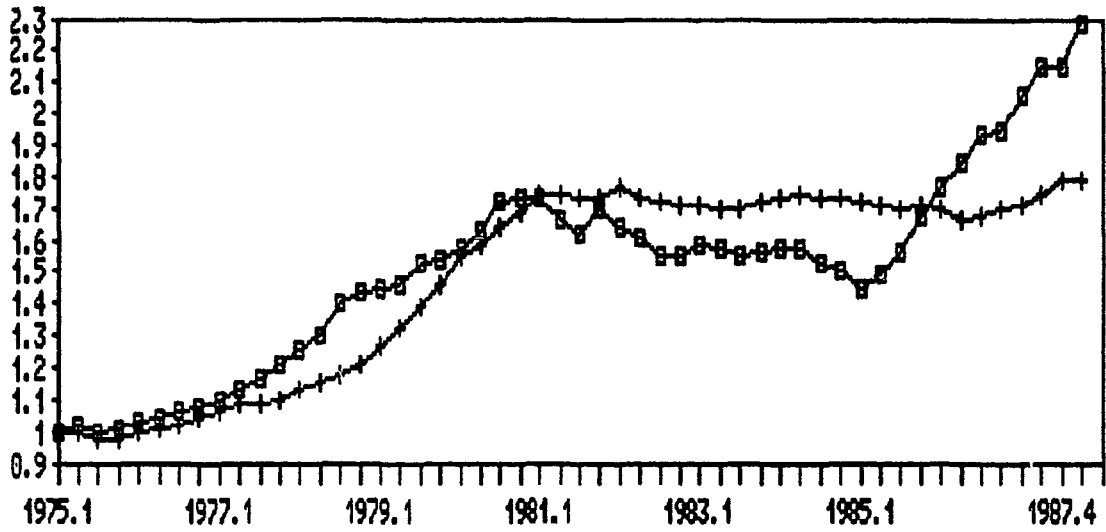
□ CPI's Basket   + Price of Traded

FIGURE III.3
ALTERNATIVE REAL EXCHANGE RATES
(Base 1980=100)
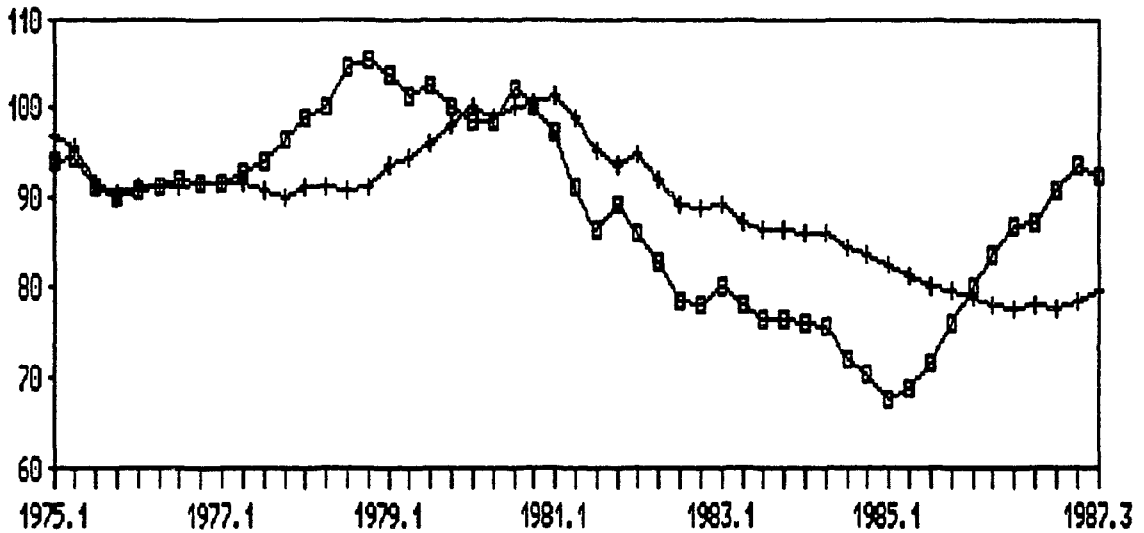
□ INS REAL EXCH.RATE   + PT/PH

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It can be seen in Figure 2 that since around 1981, the basket of CPI's measure starts diverging significantly from the index of traded goods prices for the U.S..The question is therefore which measure should be used to construct the U.S. Real Exchange Rate. Figure 3 shows the alternative measures, using the U.S. CPI as the deflator. The CPI's Basket measure is represented by the series constructed by the IMF Information Notice System , and is denoted as the INS Real Exchange Rate. The Real Exchange Rate using the export and import unit values is denoted by PT/PN .

Since it is obvious that both measures of the RER move very differently, the question of which one would be relevant for policy purposes requires additional analysis in order to be answered.

In the particular case of the U.S. there is an additional problem relating the usefulness of the Real Exchange Rate measure for policy purposes. This arises because the U.S. is an important price setter in the market for traded goods. Therefore, we should not expect an immediate response form traded goods prices measured in dollars derived from a change in the value of the dollar in terms of other currencies. In fact, we may not even expect PPP to prevail as strongly as it would in the case of a smaller country. The 1986-87 experience shows that the substantial dollar devaluation failed in increasing the dollar prices of U.S.traded goods. Worse than that, the dollar devaluation apparently also failed in reducing the foreign currency prices of the goods traded by the U.S.. In consequence, PPP must not have held during this period. There is evidence, however, that prices are slowly converging to PPP, but the problem remains of whether the U.S., by nominal devaluations can affect the level of the relevant real exchange rate within a time frame useful for policy purposes.

For most other small open economies, the U.S. problem does not arise as changes in the value of the domestic currency in terms of foreign exchange are quickly reflected in the domestic currency price of traded goods.

Preliminary Empirical Evidence

We have seen above that the Real Exchange Rate should be related to the Trade Surplus and the Terms of Trade in order to guarantee equilibrium in the market for non-traded goods. Figures 4 and 5 show the plots of the two RER measures against the ratio of the U.S.Trade Surplus to GDP. It is quite evident than in the period covered, the measure using the basket of CPI's (the INS Rate) has no evident relation to the trade surplus. The measure using actual traded goods prices, however, shows clear signs of being positively related to the Trade Surplus.

FIGURE III.4
PLOT OF TSGNP AND INS REAL EXCH.RATE
(QUARTERLY 1975.1 1987.3)

INS REAL EXCH.RATE
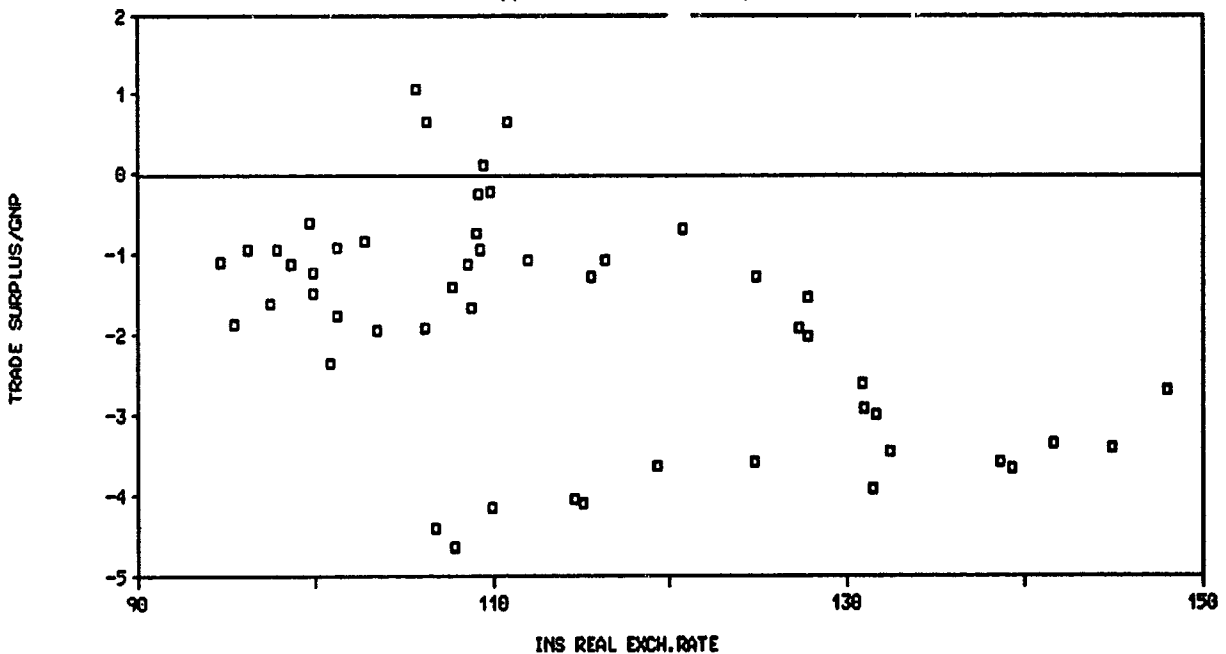
FIGURE III.5

PLOT OF TSGNP AND PT/PH
(QUARTERLY 1975.1 1987.3)

PT/PH
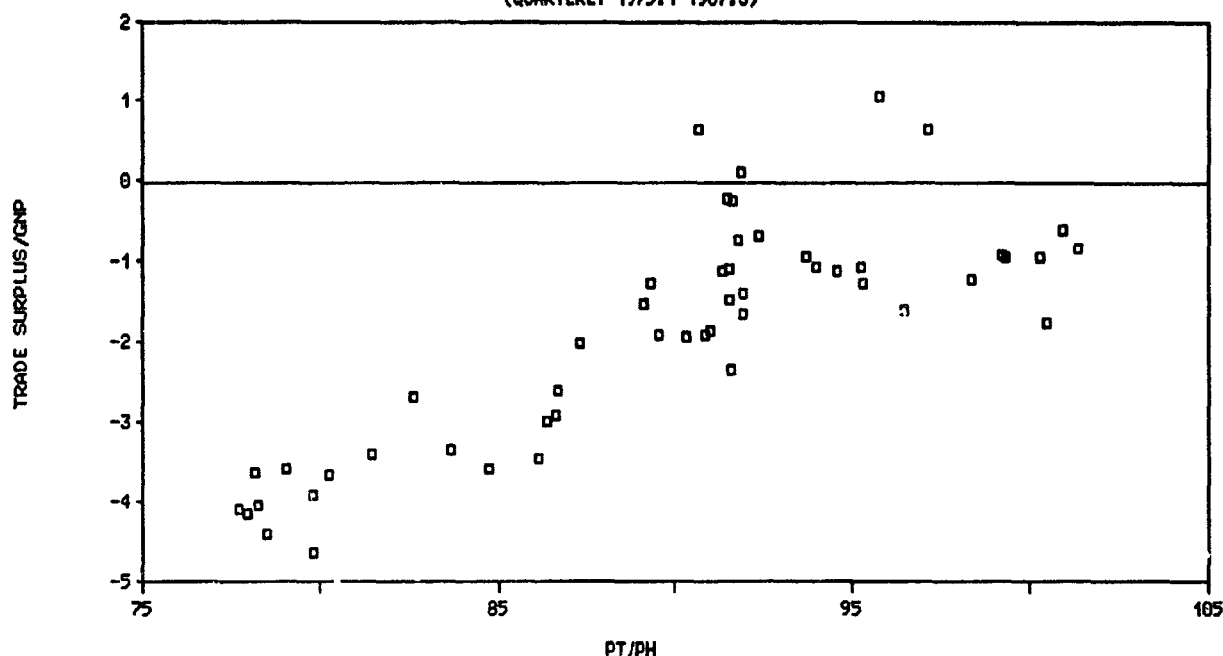
As mentioned in the theoretical analysis, one should expect a positive relationship between the RER and the ratio of the Trade Surplus to GDP while the sign of the relation with the Terms of Trade could not be determined a priori.

The results of the empirical fit of equation (15) for Argentina, Colombia and the U.S.A. are reported in Table 1. Since the Trade Surplus is also an endogenous variable, Two Stages Least Squares estimation was used in order to correct for the simultaneous determination of the Real Exchange Rate and the Trade Balance. In the case of U.S.A. also the terms of trade were considered to be simultaneously determined. Among the instrumental variables used was the ratio of the Fiscal Surplus to GDP, since this variable is expected to have an impact on the Trade Surplus.

It can be clearly appreciated from Table 1 that the PT/PN measure yields a substantially better fit than the Basket rate in two of the three countries, Colombia and U.S.A.. All regressions have been corrected for first order autocorrelation, given by the AR(1) coefficient whenever this procedure was deemed required.

The information of Tables 1 and 2 provides some evidence in favor of using actual traded goods prices instead of a basket of price levels as measure of traded goods prices. Some additional studies are however, called for, as one of the three cases, Argentina, does not support this view , at least for the period under analysis. For the two other countries, the measure using actual prices of traded goods performs substantially better than the Basket measure.

TABLE 1

EXPLANATORY REGRESSION FOR THE REAL EXCHANGE RATE

USING A BASKET OF CURRENCIES

	U.S.A.	COLOMBIA	ARGENTINA
Constant	11.61	4.441	4.32
(T-Value)	(1.5)	(180)	(42)
Log(Terms of Trade)	-1.602	-0.381	-0.21
(T-Value)	(-0.97)	(-2.35)	(-0.8)
Trade Surplus/GDP	-0.047	0.041	0.054
(T-Value)	(-0.9)	(3.73)	(3.16)
AR(1)	0.936	-	0.655
(T-Value)	(16.4)	-	(3.55)
R2 Adj.	0.81	0.37	0.84
S.E.of Regression	0.055	0.08	0.13
D.W.	1.23	1.26	1.62
PERIOD	75.IV-85-III	1971-1986	1972-1987

INSTRUMENTAL VARIABLES:
Log.T.of Trade (0,-1),Fiscal Surplus/GDP (0,-1),Trade S./GDP(-1)
Real Exch.Rate(-1). The USA regression is done with quarterly
data seasonally adjusted at annual rates and does not include the
current terms of trade as instrumental variable.
The Terms of Trade variable corresponds to the ratio of internal
prices of exports and imports.

TABLE 2

EXPLANATORY REGRESSION FOR THE REAL EXCHANGE RATE USING ACTUAL TRADED GOODS PRICES

	U.S.A.	COLOMBIA	ARGENTINA
Constant	4.71	4.558	4.649
(T-Value)	(0.64)	(170)	(49.3)
Log(Terms of Trade)	-0.022	0.139	0.006
(T-Value)	(-0.01)	(0.79)	(0.03)
Trade Surplus/GDP	0.052	0.0445	0.042
(T-Value)	(3.69)	(3.77)	(2.02)
AR(1)	0.773	-	0.600
(T-Value)	(1.53)	-	(2.26)
R2 Adj.	0.91	0.71	0.50
S.E.of Regression	0.023	0.091	0.14
D.W.	2.13	1.39	1.61

INSTRUMENTAL VARIABLES:
Log.T.of Trade (0,-1),Fiscal Surplus/GDP (0,-1),Trade S./GDP(-1)
Real Exch.Rate(-1). The USA regression is done with quarterly
data seasonally adjusted at annual rates and does not include the
current terms of trade as instrumental variable.

As indicated previously, we should not expect any definite sign for the coefficient on the terms of trade as it would depend heavily in the kind of weights used in the aggregation for constructing the real exchange rate measure. For five of the six regressions we carried out, the coefficient on the the terms of trade comes out statistically insignificant. This is not a welcome result if we want the regression to tell something about the effects of commercial policy on the exchange rate.This defect will be corrected later using as different aggregation.

It is surprising the values taken by the estimated coefficients on the ratio of the Trade Surplus to GDP. This coefficient comes significant in five out of the six cases. In all those five cases, it value ranges between 0.40 and 0.53. Since we are dealing with three different countries, this coincidence is surprising and deserves further work to see how much it does generalize to other countries and time periods. Taking an average of 0.45, the estimated value for the coefficient means that a permanent increase in the Trade Surplus of 1% of GDP requires a 4.5% increase in the equilibrium level of the Real Exchange Rate (at least in the two types of measures we have constructed). The stability and similarity of this coefficient across countries proves encouraging as it provides an extremely useful link between two key macroeconomic variables that are usually at the core of structural adjustment programs. The story is incomplete, however, as we still have to find out the fundamentals behind the determination of the Trade Surplus.

III.4   Real Exchange Rate and Commercial Policy

In the empirical analysis conducted above we failed to find any significant relation between our different measures of the Real Exchange Rate and the Internal Terms of Trade, that in turn are determined by Commercial Policy and external prices. This may be taken to imply that changes in the external terms of trade or in taxes or subsidies on trade may not require appropriate changes in nominal exchange rate policy as the real exchange rate is apparently independent from them. We do know, however, that on a theoretical basis we should not expect such extreme independence to hold. We are therefore inclined to think that the aggregation used to construct our two measures of Real Exchange Rate biased the estimation in favor of producing a statistically insignificant coefficient.

The basic problem is that the Real Exchange Rate intends to
be an aggregate of the average price of traded goods in terms of
non-traded goods. It is well known that such an average fails to
perform when there are changes in the relative prices of the
products used to construct it. If the relative price between
exports and imports change, the concept of price of traded goods
loses operational sense. In that case one should properly
identify at least two real exchange rates: one for exports and
one for imports. This point was clearly discussed in Section II
when discussing the effects of import liberalization.

We can easily modify our presentation here to explicitly
incorporate an export and an import real exchange rate. This
requires normalising eqn.(1) by either price of traded goods
instead of an average of both. In this case, the final
equilibrium condition in the market for non-traded goods becomes:

$$(16) \quad Qh(Px/Ph , Px/Pm) = Ch(Px/Ph, Px/Pm). (1-ts)$$

What eqn.(16) is showing is that the price of the home good,
Ph, is determined by the prices of the two other goods, Px and Pm
and the level of excess demand in the economy (-ts). Solving
explicitly in terms of rates of change, we can express the
changes in Ph required to attain equilibrium in the market for
non-traded goods as:

$$(17) \quad DPh/Ph = w.DPm/Pm + (1-w).DPx/Px - z.Dts \quad , \quad (Dx= dx/dt)$$

where w is the elasticity of Ph w.r.t. the domestic price of
imports (presumed positive and less than unity in absolute value)
and z is the semilog elasticity of Ph with respect to the trade
surplus (normalized by GDP).

In turn, the changes in Px and Pm can be divided in three
sources: exchange rate, foreign prices and trade taxes:

$$(18) \quad DPx/Px = DE/E +DP*x/P*x - Sx$$

$$(19) \quad DPm/Pm = DE/E + DP*m/P*m + Tm$$

Substituting (18) and (19) into (17) we obtain:

(20) $DE/E - DPh/Ph = - \{w.(DP*m/P*m) + (1-w).(DP*x/P*x)\} -$

$- \{w.Tm + (1-w).Sx\} + z.Dts$

Given proper estimates for w and z, eqn.(20) tells the required changes in the ratio E/Ph required to recover equilibrium in the market for non-traded goods.

We have estimated the relation presented in (13) using annual data for Colombia for the period 1971-86. The results are as follows:

$Ln(Px/Ph) = 1.707 - 0.576.Ln(Pm/Px) + 0.0452.(TS/GDP)$
(T-Value)   (39.6)   (-3.39)   (3.97)

R^2 Adj.:0.85
D.W.:1.47
S.E.:0.087

The estimation used TSLQ and the instruments where current and lagged Pm/px, Government Deficit ,and lagged Trade Trade Surplus to GDP ratio.

The first thing to note is the similarity of the coefficient on (TS/GDP) with those obtained in the regressions presented in Tables III.1 and III.2.

The estimated value of w of 0.576 implies that the reduction of 10% points in import duties should be accompanied by a 5.76% real devaluation, meaning that this is the amount that nominal devaluation must exceed the price of home goods for equilibrium to be restored. In this case, the real devaluation will be obtained either by nominal devaluation, fall in Ph or any combination between the two. In this case, our measure of Ph used was the consumer price index; other measure of Ph will probably yield a different value for w. If the measure of Ph used actually has into it traded goods, the initial nominal devaluation of 5.76% will not be able to obtain the required real devaluation as Ph(as measured) in itself will tend to increase by some fraction of this amount. Because of this measurement problem, it is better to specify the exchange rate adjuscment in relation to the price index used as deflator in (20).

We recommend that exchange rate policy in the face of structural adjustment be based on the prediction of an equation such as (20) properly estimated for the country in question. From this perspective we have identified three main sources requiring possible adjustments in the nominal exchange rate once deflated by an appropriate index of non-traded goods prices: changes in terms of trade, international inflation, commercial policy and domestic absorption relative to GDP (measured by the ratio TS/GDP).

IV. THE TRADE BALANCE

IV.1 Introduction

We have already established that the real exchange rate is determined, among other variables, by the level of the Trade Balance this being measured as the excess of output over absorption of goods and services. In determining the level of the Trade Surplus we have therefore to study the factors that affect the difference between output and absorption. Clearly, such a difference is related to the desired rate of accumulation of foreign assets of the country. From a practical point of view, we can identify the following variables among the determining factors of the Trade Surplus:

- Fiscal Deficit

- Interest rates, domestic and foreign

- Terms of Trade

- Output level

-Net income from (payments to) foreign assets and level of

  external assets   (debt)

It is very difficult to construct a general model of determination of the Trade Balance, as the fundamental factors determining it are likely to vary widely from country to country. We will therefore try to concentrate on what we believe are some of the most commonly observed factors in the process of determination of the Trade Balance without implying by this that our analysis has been exhaustive.

IV.2 Trade Surplus Determination with Quantity Constraints

All of the above variables are directly linked to the determination of the equilibrium level of domestic absorption. We shall not attempt to explain quantitatively the determination of the Trade Surplus in disequilibrium situations, as we cannot imagine any general model for doing it. For example, trying to quantify the effect on the Trade Surplus following the liberalization of import duties while keeping constant the nominal exchange rate may prove to be an impossible duty as importers may try to anticipate imports in the face of the likely increase in the real exchange rate that eventually should take place, either through a future devaluation or a fall in prices of non-traded goods.

In general, if the real exchange rate is not allowed to take its equilibrium level, predicting the Trade Surplus becomes a difficult task, as its level would certainly depend on the rationing mechanisms used in order to allow the disequilibrium to continue. Such would be the case of countries where the authorities index the nominal exchange rate to the maintenance of a fix level of some measure of the real exchange rate and in addition use quantity constraints such as import quotas. In such a situation, the potential excess demand of the economy cannot show up in a Trade Deficit but will rather appear as domestic shortages and a black market premium for foreign exchange. In that context, a real devaluation may boost exports without any increase in imports and we may observe an improvement in the Trade Surplus. The question is how long can that situation continue. If the government is buying the extra foreign exchange with genuine resources, the counterpart must be a fiscal surplus and everything will fit in our conceptual equilibrium model : the Trade Surplus could be predicted from the planned fiscal surplus.

If however, the foreign exchange is bought by printing money, the internal disequilibrium will be aggravated: black market premium will increase and there will be inflationary pressures. Given the rate of acquisition of reserves, there will be an associated rate of money creation and of the inflation tax. What we have therefore is a situation in which the Central Bank is imposing an inflation tax which proceeds are used for the acquisition of foreign exchange.

The above is a particular form of the inflation tax as it does not have the counterpart of a deficit in the non-financial public sector. This is tax imposed and collected by the Central Bank and used to accumulate Reserves or service its foreign debt.

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In this situation, the best that can be done to _redict the Trade Surplus is get some estimate of the export respon e to the real devaluation and another estimate of how much will authorities allow imports to increase.

In general, when there are import and capital controls, we cannot specify a general rule for determining the trade surplus as it will depend on the rationing mechanisms in use. But in such cases, the equilibrium approach for determining the Real Exchange Rate is also not valid. The real exchange Rate will be determined by the monetary authorities through the indexing rule. The Trade Surplus, in turn, will equal the amount of inflation tax authorities want to use for the purchase of foreign exchange.

If a country is in a situation such as the one described above, we feel that structural adjustment should start by restoring the role of markets before even trying to adjust anything else. Predicting what the Real Exchange Rate should be if some import quotas are lifted may turn out to be an impossible task.   In that context, I feel that macroeconomic policy more than specify target levels must specify the implementation of market oriented rules.

For example, consider the case of an economy using import quotas that are eventually to be lifted as part of a Trade Reform program. In that case I would recommend the immediate lifting of the quotas and its replacement by the implementation of an import budget to be auctioned among all importers. Luxury imports, in the transition, may be discouraged by the imposition of additional import duties. The import exchange rate, therefore, does not become a macroeconomic variable to be determined by the program as it would be a market determined variable. The export exchange rate, in turn, should be moved, as circumstances permit, towards the, presumably higher, level of the freely determined import rate.

One may, however, wonder what is the reason for the foreign exchange rationing. One may find here two main reasons related to macroeconomic factors. First is the existence of a high fiscal deficit that would imply a trade deficit not compatible with the availability of foreign financing.

Reluctance of authorities to reduce their deficit induces them to look for internal sources of financing. If those are not found, they end up imposing import controls as a way to control the otherwise unavoidable trade deficit resulting from the increased spending.

The solution to this problem is to reduce the fiscal deficit, or develop alternative ways of internal financing and allow the increase in the real exchange rate required to attain market equilibrium.

The second reason may be that authorities are fearsome of the income distribution effects of allowing a rise in either the import or export exchange rates. In that case we feel the first step should be exchange rate unification at the equilibrium level and to duplicate the desired relative price structure through trade taxes or subsidies. We do not feel that multiple exchange rates and quantity controls should be used as substitute for commercial policy instruments in the context of structural adjustment programs. Here again we favor measures aiming at market transparency as a first step in the design of structural adjustment.

IV.3 Trade Surplus Determination with Functioning Markets

Given a reasonable degree of capital mobility and price flexibility in foreign trade, the trade surplus should be readily explained by the variables determining income and absorption to which we made reference above.

Obtaining a general structural equation form for determining the trade surplus exceeds the scope of this work and most likely it would not prove to be successful as some variables will be relevant in some countries and not in others. Furthermore, the specific values of the coefficients will depend highly on the situation in the country being analyzed, in particular the degree of openness of the economy to goods and assets trade.

For illustrative purposes only, we include the following regression explaining the Trade Surplus in Colombia using annual data for the period 1970-86. The dependent variable is the ratio of the Trade Surplus to GDP and the explanatory variables are just two: the external terms of trade and the Fiscal Surplus to GDP ratio. The results are as follows:

(21)

$$TS/GDP = 1.978 + 7.17 \, Ln(TofTrade) + 0.710 \, (Fiscal \, Surplus/GDP)$$
(T-Value) (3.8) (3.63)   (5.14)

R2 Adj.:0.77
D.W.:2.06
1970-1986

The results of the above regression are exceptionally good given the small number of explanatory variables involved. No doubt they would be improved even more if additional variables contributing to the explanation of absorption are included. Among these we would like to include the variables related to the degree of external debt: the level of the debt and its service: we expect the level of the debt to increase the Trade Surplus(because of its positive effect on savings) and its service to increase the Surplus (because of the reduction in disposable income) proportionately.

IV.4 Effects of the Real Exchange Rate on the Trade Surplus

The theoretical approach we have followed so far indicated that the Real Exchange Rate is the price that equilibrates the market for domestic goods for any given level of excess demand in the economy. From that perspective, the Real Exchange Rate is determined by the Trade Surplus and not viceversa. For example, an increase in the fiscal deficit should generate a larger Trade Deficit and this in turn would induce a real appreciation of the exchange rate. We view the solution to the trade Deficit as improving the Fiscal Deficit; once this is done, a real devaluation is needed to restore market equilibrium.

The causality relation established above is fundamental for policy purposes as many policy recommendations are usually based on implementing a real devaluation as a way to improve on the Trade Deficit. If the real devaluation is not implemented together with an expenditure reduction measure (like reducing the Fiscal Deficit), the economy would not be in equilibrium and the real devaluation will be hard to sustain in the face of unchanged inflation tax (a point already discussed above).

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The Colombian data confirms our presumption that when the fundamental determinants of the Trade Surplus are included, the Real Exchange Rate does not add significantly to the explanatory power of the regression. This point is shown in the following regression were we have added the PT/PH version of the Real Exchange rate as an additional explanatory variable in (21).

(22)

TS/GDP= -19.8 + 4.81 Ln(TofT) + 0.57(Fiscal S./GDP) +4.68 Ln(RER)
(T-Value)(-0)   (1.4)   (2.7)   (0.87)

R2 Adj.:0.76
D.W.:2.19
1970-1986

The results show that the coefficient of the RER is not significantly different from zero and that the coefficients of the Fiscal Surplus and the Terms of Trade do not change their values significantly.

In conclusion, the Real Exchange Rate is as much an endogenous variable as the Trade Surplus and therefore one could not use one to affect the other. The proper policy assignment to improve the Trade Surplus is to reduce absorption relative to income (i.e. through the fiscal deficit or other appropriate exogenous variable) and then allow for the required real devaluation that should accompany the improvement in the Trade Surplus.

IV.5 The Effects of Temporary versus Permanent Changes in the Terms of Trade

An important policy question is what should be done to the Real Exchange Rate in the presence of a temporary shock to the terms of trade. This is particularly relevant for countries with a little diversified export sector, a problem that seems common among countries in need of structural adjustment.

Conventional economic theory suggests that a temporary windfall in income should be saved and only gradually be spent over time. In terms of foreign trade, this analysis suggests that a temporary improvement in the terms of trade should be used to accumulate foreign assets instead of devoting the extra foreign exchange to immediately increase imports. This implies that the improvement in the Trade Surplus should be larger when the improvement in the terms of trade is temporary rather than permanent.

Our analysis is again confirmed using the Colombian data. We have opened up the terms of trade between a "predictable" component and the deviation from it. The "predictable" trend was obtained by an Arima(1,2) process. The results are shown in the regression shown in Eqn.(23). As expected, the coefficient on the temporary component of the terms of trade (DEV) is larger that the coefficient on the predictable component (PRED). This implies that the trade surplus increases by more when the changes in the terms of trade are above what can be considered normal.

(23)

TS/GDP = 1.81 + 8.06 DEV + 6.55 PRED + 0.70 (Fiscal S./GDP)
(T-Value)   (2.9)   (3)   (2.7)   (4.9)

R2 Adj.=0.75
D.W.= 2.08
Annual data 1970-1986

Consider a 20% temporary increase in the terms of trade (DEV=0.2). This results in an increase in 1.61 % in the ratio TS/GDP as compared with the increase of 1.31% if the change had been permanent.

The fact that the terms of trade change can be temporary or permanent will also have an effect on the required adjustment in the level of the Real Exchange Rate. According to Eqn(20), an

increase in export prices will have a direct impact on the exchange rate in proportion to the parameter $-(1-w)$, if the objective is to maintain equilibrium at an unchanged level of Ph. Therefore, the impact effect of an improvement in export prices is to require a revaluation. There is a secondary effect, however, through the change in the Trade Surplus induced by the change in export prices. This effect calls for a devaluation in proportion to the value of the parameter z times the improvement in the TS/GDP ratio. The net effect on the exchange rate will therefore be equal to the sum of both terms.

Substituting the relevant terms of Eqn(23) in Eqn(20) and using the estimated values of z and w we obtain the following relation between the required changes in the nominal exchange rate in response to a change in export prices (temporary or permanent:

$$(24) \quad dE/E = -(1-0.576).(dP*x/P*x) \quad \text{(Direct impact effect)}$$

$$+ 0.0452.(8.06.DEV +6.55.PRED) \quad \text{(Indirect Effect due to changes in TS/GDP)}$$

If the change of 20% in P*x is temporary, the adjustment calls for a revaluation 1.2%. If, instead, the 20% change was permanent, adjustment requires a revaluation of 2.55%. Clearly our data confirm that the real revaluation (relative to Ph) will be larger when the increase in export prices is permanent than when it is transitory.

V. THE FISCAL DEFICIT

V.1 Introduction

Together with the exchange rate, the fiscal deficit is the other macroeconomic variable most likely of being part of specific targeting in the context of structural adjustment. As we have discussed before, the financing of the fiscal deficit will have repercussion on domestic inflation, real interest rates or the Trade Deficit, depending on the particular form of financing chosen.

Ideally, the fiscal deficit should be no larger than what can be financed without inflation or increases in internal or external debt that are justified by the growth rate of the economy. It may be considered appropriate, however, to allow for some inflationary financing of the deficit, to the extent that the resulting inflation rate is compatible with a relatively stable environment that does not act as a deterrant to structural adjustment.

Different is the possibility of permanent debt financing in excess of the economy's growth rate. Such situation would lead to an increasing indebtedness ratio requiring ever rising real interest rates in order for the debt to be rolled over and be able to capture new funds every period. Over the medium run, relevant for structural adjustment, we therefore feel that internal and external financing must be limited to the maintenance of the debt/income ratio (or any other accepted measure of relative indebtedness).

The problem of establishing target levels on the fiscal deficit is therefore that of finding how much can be financed through an acceptable inflation rate plus increases in public debt that do not go further than what is allowed by the growth in demand for such debt.

From a practical point of view, there is the additional problem of measurement of the deficit. Countries do produce several alternative measures depending on what part of the government's operations are included: we thus have deficits corresponding to the Treasury, to the Consolidated General Government, to the Non Financial Public Sector and finally, the Central Bank deficit. To add confusion, some measures are adjusted for inflation and others are not. All of the above

problems are solved if one knows for what purpose it is wanted the fiscal deficit measure.

For our purposes we need the deficit measure that explains how much will be the inflation rate once part of the deficit has been financed through sustainable increases in domestic and foreign debt. Such measure can be obtained and corresponds to the inflation adjusted deficit of the totality of the Public Sector, including Provinces, Municipalities, Public Enterprises and the Central Bank. We will now proceed to derive algebraically the relation between this concept of the deficit, that we might name as the "balanced growth" deficit, and the resulting inflation rate.

V.2   The Algebra of the Balanced Growth Fiscal Deficit

We shall start by defining the variables that will be used in the analysis. Institutional differences among countries may imply that some of the concepts used are not operational in some cases. We therefore present what we think is the more general case with the understanding that the results should be modified to fit them to the particular institutional problems that may appear.

VARIABLES:

(1) G: Total non-interest expenditure of the consolidated Non-Financial Public Sector.

(2) T: Total non-interest revenues Revenues of the CNFPS.

(3) D: Total interest bearing internal Debt of the CNFPS plus the Central Bank.

(4) D*: Total external debt of the CNFPS plus the Central Bank.

(5) H : Non interest bearing debt of the Central Bank. We identify this measure with the Monetary Base and therefore is linearly related to the Money Supply and inflation. In some countries, part of the Monetary Base may be remunerated. In those cases the definition of H would still be the Monetary Base, but the expenditures should be modified to allow for the payment of interest.

(6) E: Nominal Exchange Rate: Domestic Currency per unit of foreign exchange.

(7) R : International Reserves of the Central Bank.

(8) Y : Nominal Income.

(9) i, i*and ir : Nominal interest rates on domestic and foreign debts and international Reserves.

The basic balance sheet identity requires that all government expenditures be equal to revenues plus new issues of debt.

According to our definition of variables, government expenditures may go to three items: Non-interest expenditures(G), interest service (i.D + E.i*.D*) and increases in international Reserves (E.dR/dt). We assume that the government has no assets from the private sector, so that there is no interest income included.If there were private assets held by the government, the concept D should be net from those assets. We would therefore be talking about net interest service and net debt.

Total expenditures just defined are financed through five items: Non-interest revenues (T), new issues of internal debt(dD/dt), new issues of external debt (E.dD*/dt),interest earned on Reserves (ir.R) and finally, new issues of Base Money (dH/dt).

The equality of expenditures and form of financing yields the following budget constraint:

$$(1) \quad E.dR/dt + G - T + i.D + E.i*.D* = dD/dt + E.dD*/dt +$$

$$+ dH/dt + ir.R$$

We now define AR, AD , AD* as the ratios of Reserves, Domestic and foreign debt to Income (Y):

$$(2) \quad AR= E.R/Y$$

$$AD= D/Y$$

$$AD*= E.D*/Y$$

Define the rate of change in Nominal Income as:

(3) $(1/Y)/dY/dt = g + I$, where G is the real growth rate and I is the inflation rate.

The calculation of the "balanced growth" deficit requires that all ratios defined in (2) be constant over time. Any planned increases in the relative size of some of those variables would required adaptation of our measure of deficit during the transitional period in which this takes place. This would be strictly a matter of short term monetary programing that is outside of the scope of the problem we are analysing here. The basic general analytical framework would, however remain the same. If the ratios in (2) are to remain constant, the following restriction applies to the increases in D, D* and R:

(4) $E.dR/dt = AR.(I + g - e).Y$, where $e=(1/E).dE/dt$, the rate of nominal devaluation.

(5) $dD/dt = AD.(I + g).Y$

(6) $E.dD*/dt = AD*.(I + g - e).Y$

Two last assumptions must be made regarding the behavior of the real exchange rate and the real interest rates. We will assume that for the purposes of our analysis, that is finding the inflation rate implied by a given fiscal deficit, the real exchange rate is constant; this means that domestic inflation is equal to the rate of devaluation plus external inflation (I*):

(7) $I = e + I*$

We shall also assume that domestic and foreign nominal interest rates are arbitraged, which implies :

(8) $i = e + i*$

Define:

(9) r= i - I and r*= i* - I*   as the real rates of interest.

The validity of (7),(8) and (9) implies :

(10) r = r*.   (A country risk premium can be incorporated

adding the premium in (8); the risk premium is likely to depend
on the value of AD*).

Substituting (4)-(10) into (3) we obtain the basic relation
determining the equilibrium inflation rate:

(11) I = {d + AR.(g+I*-ir)-g.AH + (r-g).(AD+AD*)}/AH

In the RHS of (11) we find the determining factors of the
equilibrium inflation rate. If we recall that AH is the inverse
of the Velocity of Circulation of Base Money (V), we can rewrite
(11) as:

(12) I = V.{ d + AR.(g+I*-ir) + (r-g).(AD + AD*)} - g

Eqn.(12) is the standard presentation for the factors
determining the equilibrium inflation rate: inflation is the
product of Velocity times the deficit as a fraction of Income
minus the growth rate of the economy. In our case, the role of
the deficit is captured by the expression within brackets, that,
to be more precise, captures all of the factors giving raise to
the rate of expansion in the supply of Base Money. Some of those
factors are directly associated to some of the measures of fiscal
deficits; those are the ones included in the sum d+r.(AD+AD*).
Others, like those relating to reserves or the growth of the
economy, are not usually linked with the concept of deficit. We
propose the following classification of the factors contributing
to inflation in (12):

(a) d + r.(AD +AD*) : Fiscal Deficit, inflation adjusted, of the
consolidated Public Sector, including the Central Bank.

(b) AR.(g+I*-ir) : This term represents the required purchases of
Reserves by the Central Bank and is positive on account of the
domestic growth and the seignorage from international inflation
(if Reserves earn some interest, this should be subtracted from

the seignorage, as it is done with the term ir). The acquisition
of reserves is not normally included in the calculation of public
expenditures, but our analysis suggests that it should be done
for the purposes of computing the equilibrium inflation rate.

(c) -g.(AD+AD*): This term represents the part of the deficit
that can be debt financed thanks to the growth of the economy
without adding pressure to the financial markets.

For a given inflation target, growth rate and sustainable
financial ratios, eqn.(12) indicates what should be the
compatible fiscal deficit. Such measure of the deficit
corresponds to the deficit of the consolidated public sector,
after substracting the inflation component on the totality of
interest earning government debt and adding reserve purchases by
the Central Bank. The debt concept includes the debt at all
levels of government, including the interest earning debt of the
Central Bank.

For purposes of macroeconomic policies for structural
adjustment, we recommend using the above definition of inflation
adjusted deficit as a basic element in discussing short and long
term fiscal adjustment. Regarding the level for this measure of
the deficit, we feel that in some cases the balanced growth
deficit may not be immediately implemented as the economy may be
in initial conditions quite different from those implied by our
methodology: debt ratios may be too high or too low and it may be
desired to change them; the same problem may happen with
reserves. Finally, inflation may be quite different than the
target rate used to compute the equilibrium balanced growth
deficit.

In spite of the above difficulties, our equilibrium deficit
concept should be still useful in designing macroeconomic policy.
This requires estimations of acceptable and sustainable financial
ratios. These ratios, in turn, will define the sustainable non-
interest deficit (d) that must be implemented after adjustment
has taken place. In the short run, however, a larger non-interest
deficit (d) may be allowed if it is deemed that internal or
external debt are still below the sustainable level.
The policy design in the short term would refer to the speed of
adjustment of the non-interest deficit towards the medium run
target given by the desired balanced growth deficit.

Sustainability of debt/income ratios is a difficult concept to
quantify. We have assumed that the inflationary component of

interest rates can be automatically refinanced, on both internal and external debt. We have also assumed that the ability of raising new debt increases in proportion to real growth. If that is not the case, appropriate policies should be implemented aiming at achieving sustainable debt levels, these being defined as those levels of debt at which automatic refinancing of inflation and growth can be achieved. This means that in the transition the non-interest deficit may be required to take the full burden of the adjustment, and even a surplus may be required if reductions in debt levels are called for.

To the extent that access to external credit is restricted, eqn.(12) should include only those increases in external debt that are allowed by market conditions. Under those circumstances, the arbitrage of interest rates may not be a reasonable assumption. In that case, the domestic real rate of interest may increase as AD raises, a factor crucial in determining the feasible level for AD.

Given the importance of the case when there are restrictions of access to external credit, we have recalculated eqn(12) to allow for this special circumstance. To do so we have assumed that eqn.(8) of arbitrage of interest rates is not valid and that external debt can grow in just a fraction of the nominal interest due: $dD*/dt= v.D*$, where $v < i*$ is the part of nominal interest that foreign creditors will supply for purposes of refinancing. To allow for this fact, we should substitute the term $(i*- v).AD*$ for the term $(r-g).AD*$ in (12) in order to obtain:

(13) $I = V.\{ d + AR.(g+I*-ir) + (r-g).AD + (i*-v).AD*)\} - g$

Normally we would assume that $v < I* + g$, so that there is some limitation to the desired access to foreign credit. This in turn implies that $(i*-v) > (r* - g)$ and therefore, in this case of restricted refinancing, other sources of deficit will have to be lowered (or inflation raised) in order to allow for the required reduction in AD* over time.

V.3 Short Run Dynamics

While it is outside of the scope of this paper to present a detailed analysis of the problem of short run dynamic adjustment, we can still illustrate some of the problems likely to be found within the methodological framework developed in the previous Section.

Since the issue of seignorage on Reserves does not seem to be that much of practical relevance, we will make the additional assumption that Reserves earn a real interest rate equal to the growth rate of the economy. With that assumption, the seignorage term on Reserves disappears from eqn.(12).

In order to analyze short run dynamics we cannot assume that all the debt and reserve ratios remain constant over time. Allowing for changes in those ratios, eqn.(12), in its short run version, now becomes:

(14)   I = v-g + V.(d+(r-g).W + dAR/dt - dW/dt) ,

where:

v= (1/V)(dV/dt) is the rate of change in velocity and

W= AD + AD* is the total public debt/income ratio.

Assume an initial situaticn where the debt ratio is too high and has to be reduced. According to (14), there are two ways to do it (leaving aside the obvious one of paying debt with Reserves). One is to reduce d, the inflation adjusted fiscal deficit of the public sector until the desired debt reduction is obtained. In this case the reduction in d results in equivalent reduction in the debt/income ratio. This amounts to the mot simple way to pay for one's debts: reduce other spending and use the saved proceeds to cancel outstanding debts (or, alternatively, increase tax revenues in order to rescue debt). In this alternative, there is no need to change the rate of creation of Base Money and therefore we should not expect any important effects on the inflation rate unless there are some indirect effects of the debt reduction on desired velocity.

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The second alternative amounts to raise the inflation tax in order to rescue the excess debt. As a consequence, inflation during the transition will be above the desired long run level. Since raising inflation is bound to increase velocity, the term v will become positive and as a consequence, some of the higher inflation will result in a reduction in real money balances. As the base of the inflation tax is reduced, inflation should be increased in order to provide the same needed real revenue.

It is known that there is a maximum to the amount of revenue that can be raised with the inflation tax before generating a hiperinflation. This amount corresponds to the solution to the maximum value for the equation: Max.Inf.Tax= I/V(I). Attempts to raise a higher revenue than this maximum will require ever increasing rates of money creation and inflation.

In general terms, we can affirm that debt reduction through increased inflation tax is bound to increase inflation during the process but allow a lower permanent inflation rate whenever the real interest rate is larger than the growth rate. Conversely, increases in debt ratios allow for a lower inflation rate in the transition but will imply a new higher permanent inflation rate.

VI. RECOMMENDATIONS

Adjustment in the levels of key macroeconomic variables is required in the context of Structural Adjustment on two main grounds:

(1) It is needed in order to provide a stable macroeconomic environmert that should facilitate the transfer of resources required for adjustment.

(2) Some macroeconomic adjustments may be required in order to restore global equilibrium as a result of the implementation of microeconomic measures included in the adjustment package.

(a) INFLATION TARGET

A stable macroeconomic environment requires a stable rate of inflation at a level that does not interfere with resource mobilization. Such rate may depend on the specific condition of each country. In general, we feel that inflation rates in excess of 20% per year may turn out to be unstable rates, introducing an undesired variance in the price system. We recommend that over a period prior to the implementation of the main adjustment effort, measures be taken to achieve the inflation target.

Achievement of the inflation target is to be obtained exclusively through fiscal measures, mainly through the determination of the balanced growth deficit compatible with such inflation rate. Needless to say, targets must be defined over the fundamental determinants of the inflation rate and not on the inflation rate itself, as this is an endogenous variable not subject to direct determination by the authorities.

(b) FISCAL DEFICIT

For a given inflation target, we have defined the "balanced growth deficit" as that deficit of the consolidated public sector that is consistent with that target and the maintenance of stable ratios to GDP of internal and external public debt. Targets must be defined on the path of the fiscal deficit so that it approaches the balanced growth deficit in a reasonable period of time, never to exceed the length of the adjustment program.

The measure of the fiscal deficit we have obtained here as being relevant for determining the sustainable inflation rate corresponds to the deficit of the consolidated Public Sector, including the Central Bank, adjusted for the inflation component on the nominal interest paid on the public debt, both internal and external. Adjustment should also be made to the extent that the growth rate of the economy allows for increasing public debt without adding pressure to the financial markets.

(c) EXCHANGE RATE POLICY

Nominal exchange rate policy should aim at obtaining the equilibrium level of the Real Exchange Rate. In this context we view the Trade Surplus as being determined mainly by macroeconomic factors and the Real Exchange Rate is the relative price that allows the resource transfer dictated by the macroeconomic factors. From this perspective, a Trade Surplus requires a specific level of the Real Exchange Rate if it is going to be viable without need for rationing or shortages in markets.

We do not recommend using the real exchange rate to generate Trade Surpluses in the absence of additional macroeconomic adjustments. The reverse is however correct: if macroeconomic adjustments have taken place that require a Trade Surplus, then the Real Exchange Rate should adjust to make it possible.

We have also identified required changes in the Real Exchange Rate in response to modifications in Terms of Trade or Commercial Policy. The magnitude of the required adjustments is bound to depend on the specific structure of each country. We have presented a basic structural equation determining the Real Exchange Rate as a function of the Terms of Trade, Tariff Rates and the Trade Surplus. Such equation should be estimated for the

specific country being dealt with and used to determine the required changes in the Real Exchange Rate. Basically this requires estimating two parameters, one being the response of the RER with respect to the internal terms of trade (that in turn depend on the external terms of trade and trade taxes or subsidies) and the other measuring the response of the RER with respect to the Trade Surplus. Regarding this last parameter we have found significant similarity in regressions run for three very diverse countries (USA,Colombia and Argentina): in all cases, a raise of 1% in the ratio of the Trade Surplus to GDP requires a permanent increase in the RER of about 4-5%.

(d) TRADE BALANCE

The Trade Balance is basically determined by Macroeconomic factors. Among those we have singled out the Fiscal Deficit as the single most significant factor contributing to the generation of Trade Deficits.

With balanced growth, the Trade Deficit is limited by the country's ability to raise new external debt without increasing the relative exposure: it is therefore limited by the sustainable growth rate of the economy. From that perspective, the implementation of the "balanced growth fiscal deficit" should automatically guarantee the achievement of the corresponding equilibrium Trade Balance provided the required equilibrium level of the Real Exchange Rate is allowed to take place.

In the medium run, however, there may be need to obtain improvements in the Trade Balance, probably because the external indebtedness ratio is too high. From that perspective, the recommendation is to induce the generation of the Trade Balance improvement through absorption reduction methods. In particular, we feel that reductions in the fiscal deficit should contribute to the desired improvements in the Trade Surplus. Empirical estimation of the relation between the Fiscal Deficit and the Trade Deficit may help in estimating the required quantum of fiscal adjustment. We have found a significant and stable relationship for the case of Colombia, but this relation may not be that much stable for other countries so as to allow for a precise quantification. The reason is that the past relation between both variables will be much determined by the forms of financing of the fiscal deficit used then, and this form of financing may not be the appropriate ones for the present circumstances. In any event, granted that fiscal adjustment is required, we do not discourage the use of the regression method

as one additional piece of information for determining the magnitude for such adjustment.

From a practical point of view, a reduction in the Fiscal Deficit, if recommended for whatever reason, will have a positive impact on the Trade Surplus (or reduce the deficit). In estimating the precise magnitude of the change in the Trade Balance we can only suggest the use of the regression technique we have discussed in reference to the Colombian data. Given the estimation of the required adjustment in the Trade Balance, we can then estimate the precise adjustment required in the real exchange rate using the less controversial regression technique described previously. We expect the causality relation to go as follows: reduced fiscal deficit generates improved Trade Balance that in turn requires a real devaluation.

(e) PUBLIC DEBT, REAL INTEREST AND PRIVATE CREDIT

In an economy open to external credit, the public debt does not crowd out private credit as it can be readily obtained abroad at the prevailing real rate of interest. Countries in need of structural adjustment, however, do not normally face unrestricted access to external credit and getting it becomes the long run objective of the adjustment process. In the transition, internal public debt becomes a determining factor of the real cost of credit. We recommend that internal public debt do not exceed a level proportional to the size of the productive activities of the public sector in the economy (e.g. do not include transfers in the measure of the size of the Public Sector). Such target may be difficult to implement initially as public debt is likely to exceed this ratio. In that case, the least that should be required is that this ratio be observed on all incremental credit granted by the institutionalized financial system (mainly Banks and Financieras).

Short run increases in Public Debt are helpful for instrumenting short run falls in inflation, as liquidity is restricted. In the medium run, however, the real interest service of such debt adds to the fiscal deficit and contributes to even higher inflation. In addition, the real interest rate is likely to have risen and this contributes negatively to growth and resource mobilization. In consequence, we discourage the use of policies based on increasing internal public debt that go beyond a level that requires a real interest rate in excess with that compatible with the adjustment program. In general, most countries trying to implement structural adjustment programs have

gone beyond that limit as their real interest rates far exceed
the productivity of domestic investment. Therefore, reduction in
public debt to acceptable levels (like being proportional to the
size of the public sector) may be a fundamental macroeconomic
condition for the success of the adjustment program.

(f) MACROECONOMIC POLICY IN HIGHLY DISTORTED ECONOMIES

We define a highly distorted economy as one in which the
price system performs little or no role in the process of
resource allocation. Usually there are some if not all of the
following mechanism in effect:

-Price Controls

-Wage Controls

-Rationing of Foreign Exchange, Multiple Exchange Rates

-Interest rates controlled and credit rationing

In this case, predicting market behavior in order to
determine precise quantitative macroeconomic targets may be all
but impossible. Normally, one would expect that all of the above
distortions are the result of some level of excess demand in the
economy. If that is the case, and if the fiscal deficit appears
as the main culprit, reduction of the deficit should be a primary
target. However, we would recommend that other immediate concern
should be given at qualitative changes aimed at quick restoration
of the market mechanisms. Lifting of price controls, QR's,
exchange rate unification (and possible floating) are measures
that can be immediately implemented. In general, we think that no
structural adjustment plan can be even devised, least
implemented, in an economy where QR's have replaced the price
system. We therefore recommend a pre-adjustment period during
which QR's are significantly reduced to acceptable levels, before
the structural adjustment program starts being devised and
implemented.

The lifting of QR's may require macroeconomic adjustments. We cannot offer, however, precise quantification of the required adjustments since these will depend on the specific set of restriction prevailing in each country. Some qualitative direction of changes may be obtained, but I do not think one could provide a precise taxonomy given the multiplicity of cases one has to deal with in different countries. In the presentation on Trade Liberalization, we have discussed some examples regarding the appropriate measures in a process of elimination of QR's on imports and exchange rate unification. This cases, however, by no means pretend to cover the whole range of problems one normally deals with in the context of QR's.

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