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WP/88/95

INTERNATIONAL MONETARY FUND

Fiscal Affairs Department

The Impact of Macroeconomic Policies on the Level of Taxation
(and on the Fiscal Balance) in Developing Countries

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October 24, 1988

Abstract

In recent years the level of taxation of many developing countries has changed dramatically over relatively short periods. These changes are too large and too sudden to attribute fully to a deterioration in tax administration or to changes in the traditional determinants of tax levels. The paper argues that they should be attributed mostly to macroeconomic policies. The paper discusses the connection between tax levels and (a) the real value of the official exchange rate, (b) import substitution policies, (c) trade liberalization, (d) inflation, (e) public debt, (f) financial policies. The paper concludes that more attention should be paid to those relationships and that tax reform should aim at neutralizing some of these effects.

JEL Classification Numbers:

121; 320; 431

*An earlier and much shorter version of this paper was presented at the "XX Jornadas de Finanzas Públicas" Córdoba (Argentina), September 23-25, 1987. The author would like to thank Mario Blejer, Lans Bovenberg, Sebastian Edwards, Adrien Goorman, and Brian Pinto for valuable comments on an earlier draft.

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Summary

In recent years the level of taxation of many developing countries has experienced considerable fluctuations over relatively short periods. These fluctuations cannot, in many cases, be attributed to deteriorating tax administrations or to changes in the traditional determinants of tax levels, such as openness, exports of minerals, and per capita income. Other factors must consequently have played a significant role. This paper identifies these other factors as the countries' macroeconomic policies.

The paper first discusses the extent to which tax revenue is related to the level of the exchange rate and to the degree of import restrictiveness. The level of the official exchange rate is shown to have important effects on import duties, export taxes, sales taxes, and excise taxes. Import substitution policies are also shown to reduce tax revenue in the typical developing country.

The paper then discusses the connection between trade liberalization and tax revenue. It argues that a policy of trade liberalization, consisting of reduction in high import duties, imposition of (low) import duties on previously exempt imports, removal of quantitative restrictions, and devaluation will often be accompanied by important increases in revenue. Their effect on the fiscal balance will, however, depend on other considerations.

The paper takes up the issue of the impact of devaluation on the fiscal balance in the presence of a large external public debt. It challenges the conclusion of several economists that in this case devaluation inevitably worsens the fiscal balance.

A summary is presented of some earlier work by the author on the effect of an acceleration in the rate of inflation on the tax-to-GDP ratio. The absolute size of the fall in this ratio is shown to depend on the increase in the rate of inflation, the size of the collection lag, and the initial level of taxation.

Finally, the paper discusses the effects on tax revenue of financial policies. Low or negative real interest rates on domestic lending are likely to reduce the tax level by promoting the expansion of a curb market, the stimulation of capital flight, the dollarization of the economy, and the purchase of real assets.

The paper concludes that when macroeconomic policies are changing rapidly and significantly, it will be much more difficult for tax reforms to have important and identifiable revenue effects. In these circumstances, tax reform should insulate, to the extent possible, tax revenue from damaging macroeconomic developments.

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I. The Determinants of Tax Levels

The level of taxation, expressed as a percentage of gross domestic product (T/GDP), varies considerably among the world's developing countries. In a few of them, it is below 10 percent. In a few others, it is above 30 percent. For the majority of countries, however, that level ranges between these two limits with an overall average of about 18 percent and a substantial proportion of developing countries in the 15-25 percent range (see Tanzi, 1987). ^{1/}

Over the past two to three decades these levels have attracted the attention of many economists who have tried to determine the factors that bring about these variations. ^{2/} They have identified many such factors reflecting either characteristics of the developing countries' economies, socio-political features of societies, or aspects of the tax systems themselves. Some of these factors are briefly discussed below under the headings of statistical determinants, institutional or social determinants, and tax policy determinants.

1. Statistical determinants

Many of the quantitatively-oriented studies on the level of taxation have regressed T/GDP against some of the following factors: (a) the level of per capita income, often taken as a proxy for the level of economic development; (b) the degree of urbanization; (c) the literacy rate; (d) the degree of monetization of the economy; (e) the ratio of exports and imports to GDP (the so-called openness factor); (f) the share of mining or agriculture in GDP; (g) the size of the country, and so forth. As Richard Musgrave and others have argued, some of these factors play an important role in determining the tax bases or the "tax handles" that can be used by governments to raise the desired level of revenue (Musgrave, 1969).

Recognizing that the extent to which developing countries fully exploit their "taxable capacities" is likely to depend on their revenue needs, a recent study has included the level of public expenditure among

^{1/} For the OECD countries the average in the 1980-85 period was between 35 and 37 percent of GDP. For a few countries, in 1985 it exceeded 45 percent of GDP (Belgium, Denmark, France, The Netherlands, Norway, Sweden). See (OECD, 1987).

^{2/} Some of this work was carried out in the Fiscal Affairs Department of the Fund (see Lotz and Morss, 1967; Chelliah, et al., 1975; Tait, et al., 1978).

the independent variables (Tabellini, 1985). 1/ The impact of the public debt (domestic and foreign) on the level of taxation should also be mentioned. The existence of a large public debt has important implications for the tax level since in the presence of such a debt the government needs to raise the revenues necessary to service it unless non-interest expenditures can be reduced, or unless the government can get access to increasing amounts of loans. When interest on the debt exceeds net borrowing plus the possible reduction in non-interest expenditure, the level of taxation must go up unless the rate of growth of the economy is high enough to neutralize this increase. Therefore, the size of the public debt becomes a positive determinant of present and future tax levels while it may have been a negative influence on levels of taxation in past years. 2/ However, to the extent that interest payments are made to foreign lenders, and to the extent that the debtor government cannot tax these payments because of special features of the loan contracts, it will lose part of the tax base. 3/

2. Institutional or social determinants

Much of the literature that has not concentrated on purely statistical relationships has called attention to more qualitative factors such as (a) the quality of the tax administration, (b) the resources that the country allocates to this function, (c) the honesty of the taxpayers, (d) the degree of corruption among tax collectors which in turn may be influenced by the level of their wages, (e) the size of the penalties for noncompliance by the taxpayers and for corruption by the tax administrators, 4/ (f) the income distribution of the country, (g) the importance of the subsistence sector and of the parallel economy, (h) the attitude of the citizens toward the government which may be influenced by the quality of public services and by the efficiency with which tax revenues are spent, (i) the form of government, and so forth. Many of these factors are difficult to quantify but are perceived to be of some importance in determining

1/ It is peculiar that this important and obvious variable was left out of earlier studies. One reason may be that in those earlier studies it was implicitly assumed that the "mobilization of resources" by the public sector is such an obviously desirable objective that governments would always try to fully exploit the "taxable capacity" of their countries.

2/ See section II for qualifications to this statement.

3/ The level of foreign assistance is also an important determinant of the tax level. Imports under foreign-financed projects (grants or concessionary loans) are often not taxed.

4/ The combination of low wages for tax administrators and low penalties for transgressions on their part creates an environment which is not conducive to efficient and honest tax administration. In some countries the effective tax level is somewhat higher than the official tax level because of the bribes that taxpayers pay to the tax administrators to reduce their official tax payments.

whether a country ends up with a high or low tax level. The extent to which taxes are evaded, or a large parallel economy develops, depends to a considerable extent on some of these factors.

3. Tax policy determinants

Among these one should include (a) the use of particular tax sources (for example, whether a country uses or does not use a value-added tax, see Nellor, 1987), (b) the number of taxes in the country's tax system, 1/ (c) the level of tax rates, 2/ (d) the use of tax incentives and tax expenditures in general, and so forth. 3/

Many studies have revealed that effective tax bases are often a small fraction of the potential or theoretical bases. For example, the effective base of the value-added tax is often less than 50 percent of the theoretical base (see Aguirre and Shome, 1987). Even more extreme figures are obtained for income taxes, where, in some cases, the base falls to as low as 10 or 20 percent of the potential, and for import duties, where various exonerations and smuggling, combined with large nontaxed imports by the public sector itself, reduce the taxable base to a small fraction of what it could be (see Tanzi, 1987).

Much of this is known to those who are familiar with the literature on taxation in developing countries. Recommendations made by tax advisors aimed at raising revenue are normally related to these tax policy determinants. Thus, new rates on existing bases or new taxes are proposed, administrative changes aimed at reducing tax evasion are recommended, the authorities are advised to allocate more resources to tax administration and to increase the salaries of tax administrators. The need to reduce exemptions and to widen tax bases is highlighted, the need to increase the level of penalties is stressed, and so forth. In recent years, tax experts have often recommended that tax bases be broadened and that tax rates be reduced in recognition of the disincentive effects of high marginal rates and of the growing

1/ Some believe that the use of many taxes facilitates the increase in the level of taxation. Others believe that the higher is the number of taxes used, the lower is the tax ratio likely to be. There is a growing literature dealing with the relationship between tax structure and tax levels. (See Feenberg and Rosen, 1987.)

2/ The one relevant consideration is the validity of the so-called Laffer curve.

3/ To the extent that a country encourages some activities through tax expenditures (e.g., United States) rather than through explicit subsidies (e.g., Sweden), it will tend to show a lower level of taxation.

importance of unreported economic activities and tax evasion. A common belief has been that high rates are partly responsible for tax evasion. 1/

The determinants mentioned above may help explain the long-run or potential levels of taxation. However, they have not been able to explain more than a small fraction of the variation of tax levels in empirical cross-section studies. Furthermore, several countries have experienced wide fluctuations in tax levels in relatively short periods of time. These fluctuations could not entirely be attributed to changes in some of these determinants. For example, in Argentina the level of taxation, expressed as a percentage of gross domestic product, fell from almost 20 percent in 1974 to about 13 percent in 1975; it rose to over 23 percent in 1980, fell again to 17 percent in 1983 and rose again to 23 percent in 1986. In Bolivia it fell from 8.9 percent in 1981 to 2.8 percent in 1983 and 2.9 percent in 1984; it rose to 8.6 percent of GDP in 1985 and to 14.4 percent in 1986. In the Dominican Republic it fell from 17 percent in 1975 to 9 percent in 1982; it rose to almost 15 percent of GDP in 1985. In Ghana it fell from 18.6 percent in 1970 to 4.4 percent in 1983 and rose to 14 percent in 1986. In Madagascar it fell from 27 percent in 1978 to 15 percent in 1982. In Mozambique it fell from 16.7 percent in 1983 to 8.5 percent in 1985. In Sierra Leone it fell from 16.5 percent in 1978 to 6 percent in 1985. Some of these variations were due to movements of commodity prices which reduced export earnings, 2/ but most of them were caused by other factors. A full explanation for these dramatic changes cannot be found in the behavior of the traditional determinants of tax levels or in the deteriorating quality of the tax administration. More specifically, one must look at macroeconomic policies. 3/ This paper focuses on these policies.

Government policies can affect tax revenue by changing (a) the real value of the exchange rate, (b) the degree of import restrictions, (c) the level of public debt, (d) the level of interest rates, (e) the rate of inflation, and through other policies. These factors are important in determining the level of taxation at a given moment in time and in determining how that level changes over time. In many cases, substantial changes in tax levels can be traced directly or indirectly to these macroeconomic policies. This aspect has not received the attention that it deserves. In this paper the relationship between major aspects of macroeconomic policies and tax revenue is discussed.

1/ However, the theoretical literature on this issue is ambiguous.

2/ See (Tanzi, 1986; Chu, 1987).

3/ In particular cases natural calamities or social upheaval may play a significant role in reducing the level of taxation.

II. Tax Revenue and the Level of the Exchange Rate and Import Restrictions

Those who follow closely the economic policies of developing countries must have observed the existence of an often negative relationship between a country's tax revenue and the real level of its official exchange rate. Ceteris paribus, an appreciation of the real official exchange rate--that is a fall in domestic currency units per unit of foreign exchange--leads to a decrease in the tax to GDP ratio. A much overvalued exchange rate implies a much lower tax ratio than would have existed otherwise. ^{1/} There are several reasons behind this conclusion; some are related to direct effects of exchange rate appreciation and some are related to indirect effects.

1. Direct effects of overvaluation

a. Effect on import duties

The most direct link between the real value of the exchange rate and the level of taxation is the relationship between the level of the real exchange rate and the base on which import duties are calculated. ^{2/} Import duties are for the most part levied with ad valorem rates and their tax base is determined by the official domestic value of the imported products. Therefore, given the volume of imports coming through official channels, the real value of imports, measured in domestic prices, falls as the exchange rate appreciates. If a country has plenty of foreign exchange and/or unlimited access to foreign loans, the fall in the domestic prices of the imported products associated with the overvaluation of the exchange rate might lead to a higher import volume which, if the price elasticity of imports is greater than one, may offset the negative revenue effects of the overvaluation. However, this is rarely the case especially over the longer run. Thus, a safe conclusion is that a developing country that lets its exchange rate appreciate is likely to experience an immediate and direct loss in one of its most important revenue sources.

b. Effect on export taxes

The overvaluation of the exchange rate affects (directly) not only the revenue from import duties but also the revenue from other taxes. Take export taxes, for example; since export taxes are imposed on export values expressed in domestic currency, the tax base for export taxes and

^{1/} It should be stressed that this is true in developing countries and not necessarily in industrialized countries.

^{2/} Import duties account for about 25 percent of all the tax revenue of developing countries and for a somewhat larger percentage of the revenue of the poorer half among these countries. See (Tanzi, 1987). Thus, what happens to import duties has an important impact on total tax revenue.

thus the revenue from export taxes will fall as a direct consequence of the appreciation of the exchange rate. 1/ Export taxes are less important than import duties. They account for about 5 percent of total tax revenue for all developing countries and for 8 percent for the poorest fourth. 2/

c. Effect on sales and excise taxes

In developing countries a large share of general sales taxes is collected from imports since in many of these countries, for a variety of reasons, much of the domestic production escapes taxation or is taxed at lower rates. For several countries for which this information is available, the share of total general sales tax revenue collected from imports often exceeds 50 percent. For example, in Pakistan more than 70 percent of the sales tax is collected at customs. Excise taxes are also often collected mostly from imported products (gasoline, tobacco, cars, televisions, etc.). So-called "domestic" taxes on goods and services (including general sales taxes and excises) account for about 28 percent of the developing countries' total tax revenue. Changes in the real level of the exchange rate affects these revenues as well. As the real exchange rate is allowed to appreciate, tax collection from general sales taxes and from some excises is likely to fall in real terms.

Developing countries rely heavily on taxes on "tradable goods." A high exchange rate lowers the value of these goods. In conclusion, the direct effect of the appreciation of the exchange rate on import duties, export taxes, and "domestic" taxes on goods and services is likely to be important since these taxes account for 60 percent of total tax revenue in developing countries.

2. Indirect effects of overvaluation

The relationship just discussed between the exchange rate and tax revenue is the direct one. However, an overvalued exchange rate affects revenue also through several indirect channels. Some of these may be very important.

First, the overvaluation of the exchange rate reduces, over time, incentives to produce export goods and to export. The volume of exports falls reducing the country's availability of foreign exchange. With

1/ However, when the exchange rate appreciates, the "implicit" taxes on exports rise when, as is often the case, exporters are required to relinquish their foreign exchange at the official exchange rate.

2/ This, however, does not mean that exports are taxed less than imports. Much of the taxation of exports comes indirectly through the requirement that foreign exchange earnings must be ceded to the government at the official rate in conjunction with the overvaluation of the exchange rate.

less foreign exchange available, imports must be reduced. As a consequence, revenue from export taxes, import duties, and domestic sales and excise taxes fall. To the extent that incomes are partly tied to exports, revenue from income taxes will also fall. 1/ Even if incomes are not directly tied to exports, the scarcity of foreign exchange will reduce domestic activities by reducing imports of raw materials and other inputs. This will negatively affect domestic income tax bases in the modern and, thus, the more easily taxable sector.

Second, overvaluation increases the probability of large future devaluations. Therefore, individuals are likely to take protective actions against that probable future event. One of these actions is to take their capital out of the country (capital flight). Another is to store their financial assets into dollar bills held within the country (currency substitution).

Capital flight and currency substitution (out of the reduced export earnings) will reduce even more the foreign exchange available for imports of goods and services. Therefore, these actions will reduce further the tax base. 2/ If individuals expect that the overvaluation of the exchange rate will eventually lead to more restrictions on capital movements, they will have an additional incentive to attempt to take their capital out of the country while there is still time.

Third, the overvaluation of the exchange rate will often bring about restrictions on the movement of goods and capital, if none existed; or it will lead to further restrictions if, as is often the case, they were already there. Restrictions are inevitably associated with black markets for both foreign exchange and goods. These black markets reduce the level of official transactions and thus the tax base. Goods will often be smuggled into the country (sometimes with the collaboration of the customs agents) and will be sold in the black market where they will fetch high prices but will pay no taxes. Both import duties, sales taxes, and even some income taxes will be lost as a consequence.

If the difference between official and black market exchange rates becomes large, and if, as is normally the case in these circumstances, exporters are requested to yield to the government at the official rate the foreign exchange proceeds that they earn, 3/ an incentive will be created for them to reduce production and/or to smuggle their export

1/ In developing countries corporate income taxes are often closely associated with mineral exports (see Tanzi, 1987).

2/ These actions will also reduce the income tax base directly. Often countries borrow to sustain, for a while, an overvalued exchange rate. The rich can escape the easily anticipated higher future tax liability by taking some of their money out of the country.

3/ In this case the implicit taxation of exports becomes high even when there are no export taxes.

goods out of the country. Producers will often simply cross the frontiers with their goods and sell their products in neighboring countries so that they can change in the black market the foreign exchange that they earn. In this way they can evade the export taxes and the "implicit" taxes on their foreign currency earnings. This is an area where the Laffer curve is likely to have relevance.

Fourth, an overvalued exchange rate accompanied by balance of payments difficulties eventually induces the government to restrict imports of manufactured consumer goods, as these are often considered less "essential," and to favor the importation of raw materials and capital equipments, because they will be considered "essential" goods. ^{1/} The latter, however, are goods that have traditionally been favored in the development strategy and in the trade policy of developing countries. In other words, the structure of imports will change in favor of goods with low or zero import duties and sales taxes and against those with high import duties and sales taxes. This change in the structure of imports has been very costly, in terms of tax revenue, to many countries. Smuggling of goods subject to high duties will increase so that the ratio of official imports over total imports will shrink. This will induce losses in import duties and in domestic sales taxes. Taxes will continue to be levied on goods sold at low prices in shrinking official markets.

Imports by the private sector will be squeezed out to accommodate lower-taxed or zero-taxed imports by public enterprises and by the public sector. Exporters' reaction will also inevitably affect revenue as exports would be discouraged by both the overvalued exchange rate and the lack of needed inputs. Producers will use their productive capacity (including land) to produce untaxed domestic or subsistence products. Or, they may switch their production toward goods that can be smuggled out of the country more easily. In conclusion domestic activity and employment in the modern or official sector is likely to fall thus reducing the tax base.

3. Taxes and import substitution policies

Apart from the inevitable restrictions associated with an exchange rate that is becoming progressively more overvalued, restrictions on foreign trade imposed for other reasons (say, to provide protection to local industry) have also implications for tax revenue. It is an obvious point, but one that is often ignored, that the imposition of quotas and other import restrictions implies that the power to tax moves away from the government and toward those who get the import permits and the foreign exchange needed to pay for those imports. Thus, there is a

^{1/} This policy makes the country and its tax bases also more vulnerable to adverse external shocks.

kind of income redistribution from the government, which loses tax revenue, to the importers, who receive rents. 1/

The imposition of quantitative restrictions will also stimulate the domestic production of substitutes. However, domestic producers will produce substitutes at higher costs but because of the quotas will be able to sell their goods at higher prices. This will also happen if there are no quotas but there are import duties. The higher the duties, the higher the prices that can be charged for domestic substitutes. Therefore, in part, but only in part, the revenue loss to the government becomes an income gain to the producers. To a large extent, import substitution, whether caused by quotas or import duties, will have redistributive effects as well as income-reducing effects because of the inevitable inefficiencies that it will create. 2/ Furthermore, because of incentive legislation, the gains to the domestic producers are often not subject to income taxes. The net result is once again a fall in tax revenue.

There are two related issues that are addressed below even though they are, strictly speaking, tangential to the main topic of this paper. The first is the impact of trade liberalization on tax revenue. The second is the impact of devaluation on the fiscal balance (as distinguished from the level of taxation) when a country has a large foreign debt. Both of these issues are important. A full treatment would require much more space than can be allocated to them in this paper.

III. Trade Liberalization and Tax Revenue

Because of current concern with incentive or structural aspects of economic policies, several countries have started on a road of trade liberalization and tariff reform. As a result of this policy change, quantitative restrictions are progressively removed and are replaced by import duties. Furthermore, high import duties are often replaced by lower duties while goods that had been imported duty free (raw materials, capital goods) are taxed with low import duties. 3/ These reforms are often accompanied by devaluation in order to neutralize some of the impact of the policy of trade liberalization on the balance of payments and to bring the exchange rate more in line with a level consistent with some sustainable medium-term external position given the lower import barriers. In other words, the main equilibrating

1/ Unless the quotas are auctioned and they fetch prices consistent with their scarcity values.

2/ It is assumed that infant industry arguments do not apply.

3/ Perhaps the Chilean experience is the most relevant one in this context. But several other countries have started on the same road. For the Chilean experience, see (Corbo, 1988). For arguments in favor of a uniform tariff, see (Harberger, 1988).

instrument for bringing the trade account into the desired balance becomes the exchange rate rather than the trade restrictions. The needed changes in the exchange rate almost always imply sizable devaluations. 1/

From the previous discussion it can be deduced that important revenue effects are likely to accompany these changes. Trade liberalization implies that the level of taxation may rise considerably in the typical developing country even when the nominal tariff structure is being reduced. 2/ The specific impact would depend, of course, on the tax structure of the country, on the size of the real devaluation, on how restrictive the trade regime has been, on the details of the trade liberalization policies followed and, finally, on the characteristics of the economy.

It may be worthwhile to make a brief inventory of the positive and negative effects on tax revenue associated with a policy of trade liberalization with devaluation since some authors have argued that the net effect is likely to be negative. 3/ Among the positive effects one should mention the following: (i) the replacement of quotas and other quantitative restrictions by tariffs; (ii) the reduction of duties from the prohibitive to a more normal range, i.e., the reduction occurs over a range of the demand curve for the imported product where the elasticity is likely to be greater than one. However, the devaluation, per se, will increase the domestic price of the product; (iii) putting low tariffs on previously exempted goods. In view of the large share of exempted goods (see Tanzi, 1987, p. 233) in total imports, this change is potentially very important in terms of revenue yield; (iv) the increase in the value of imports and in the domestic prices of the imported products because of the devaluation; (v) the likely reduction in smuggling; (vi) some positive effects, especially over the medium run, associated with increased efficiency in the economy; (vii) some positive effects associated with a possible change in the composition of import in view of the decreased incentive to bias imports toward raw

1/ A large devaluation will often reveal that the existing import duties are much too high when imports are measured at the new highly depreciated exchange rate. It is thus likely to make more obvious the need to reduce existing duties.

2/ Bovenberg has also shown that a reduction in export taxes accompanied by a depreciation in the exchange rate would raise tax revenue in Thailand. In other words, he finds some validation of the Laffer curve with respect to export taxes (Bovenberg, 1987).

3/ If the policy of trade liberalization is seen as temporary, it may be associated with costs and other effects not analyzed in this paper (see Calvo, 1988).

materials and intermediate products; (viii) some positive effects on tradable output, especially over the medium run, associated with the devaluation and the liberalization policy.

Among the negative effects on tax revenue one should recognize the possibility that, at least for some imported products, the combination of price increase due to devaluation and price reduction due to the reduction in import duties may result in a reduction in tax revenue. Furthermore, over the short run, trade liberalization with devaluation may reduce employment and output in some sectors (especially in the import-substituting sectors), enough to have some negative effect on tax revenue. However, these sectors are unlikely to have been contributing much to tax revenue.

A good case can be made that devaluation accompanied by trade liberalization is likely to result in a positive impact on tax revenue. The elimination of the overvaluation and of the import restriction should in most cases raise the share of taxes in GDP as well as improve the allocation of resources. However, the overall effect on the fiscal balance rather than on tax revenue would depend on several other considerations such as (a) the impact of devaluation on subsidies and public sector wages. Does devaluation lead to increase in subsidies when the subsidized products are imported? Does it result in increases in public sector wages because the government tries to protect the income of government employees from the effects of devaluation? (b) If public enterprises depend largely on imported inputs, are these enterprises allowed to adjust the prices of the goods and services that they sell? (c) If the country has considerable public debt, what is the effect of devaluation on the interest paid on the foreign public debt? And, if domestic debt is indexed, what will be the effect of devaluation on domestic interest payments?

In conclusion, there are many elements that point in different directions so that only a careful empirical analysis of each case could provide a reliable answer on the outcome. The opinion of this writer, however, is that for the majority of cases trade liberalization of the type outlined above would increase tax revenue and, possibly, improve the fiscal balance. The positive effect on the fiscal balance is, however, likely to be greater in the medium run than in the short run. 1/

1/ For a less sanguine view of the impact of trade liberalization on the fiscal balance, see (Blejer and Cheasty, 1988).

IV. Devaluation, External Debt, and the Fiscal Balance

The effect of devaluation (with or without trade liberalization) on the fiscal balance in the presence of a large public debt is a controversial and complex issue to which full justice cannot be done in this paper. 1/

It has often been assumed (Dornbusch, 1987) that devaluation leads to a widening of the fiscal deficits of those developing countries with large foreign public debts. As Dornbusch has put it: "The real exchange rate appears as a determinant of the deficit ratio, because the real value of the service of an external debt contracted in dollars will increase when the real exchange rate depreciates" (Ibid, p. 68). 2/ While this is undoubtedly true, it is only part of the story since that statement ignores the impact of devaluation on tax revenue. It also ignores the effect of devaluation on government revenue from publicly-owned mineral exports and the effect on government noninterest expenditure.

As shown earlier, given the tax structure of many developing countries, the positive impact of devaluation on tax revenue can be important. Of course, if the government receives revenue from mineral exports made by publicly-owned enterprises, the impact of devaluation on the domestic value of that revenue will also be positive. If government receives foreign assistance fixed in dollars, the budgetary impact of devaluation will also be positive.

The conclusion, as to the impact of devaluation on the fiscal deficit, must be that one cannot generalize. As it was true for devaluation with trade liberalization, only a specific analysis of a country's situation can provide a reliable answer to the empirical question of whether its fiscal deficit will be reduced or increased by devaluation. The basic ingredients of such an analysis would be (a) the extent to which the exchange rate had appreciated, and thus the extent of the needed devaluation; (b) the source of the depreciation, i.e., tariff reform, lower import restrictions, adverse terms of trade, deflationary policies, etc.; (c) the structure of the tax system and its dependence on traded goods; (d) the level of taxation and, thus, the absolute effect of devaluation on tax revenue; (e) the import content of public expenditure; (f) the size of the foreign interest payment in dollar terms; (g) the extent to which the government receives income (in dollars) from publicly-owned, mineral export-oriented activities and from foreign grants.

1/ For a detailed discussion of the relationship between the budget and foreign debt, see (Reisen and Van Trotsenburg, 1988; see also Tanzi and Blejer, 1988). For a discussion of the Mexican experience, see (Ortiz, 1988).

2/ On this basis some economists have been critical of Fund advice to countries to devalue to improve their external balances.

However, a country with a large foreign debt and, thus, with large payments for servicing that debt will often be forced to reduce its imports in order to generate the needed surplus in its trade account to service the debt. 1/ In recent years imports have fallen considerably as a share of gross domestic product in many developing countries with debt problems. To the extent that imports are important for determining tax revenue, the reduction in imports, per se, will have a depressing effect on tax revenue. The higher is the net interest payment on foreign debt and, thus, the needed reduction in imports, the greater will be, ceteris paribus, the fall in tax revenue. The fall in tax revenue may lead to a widening of the fiscal deficit if the government is unable to reduce public expenditure or to raise alternative revenue. 2/ The widening of the deficit would lead to inflation and, perhaps, give a further incentive to capital flight.

Putting it in different terms the servicing of the foreign public debt requires both a surplus in the trade account and a surplus in the (properly measured) fiscal accounts. But, given the high dependence of the tax system on the external sector, the creation of a trade surplus through a reduction in imports may by itself make it more difficult to achieve the needed budgetary stance. Often, the government will rely on inflationary finance rather than on ordinary and noninflationary revenue. 3/ This may explain why several countries with large foreign debt have had a tendency to experience high rates of inflation unless (as in the Philippines) they continued receiving a substantial influx of foreign assistance that made it possible for them to maintain their level of imports or, as in the case of Chile, unless they changed the structure of taxation away from its dependency on imports.

In the face of a high foreign debt situation a country would be advised to restructure its tax system away from its direct or indirect dependence on imports. Taxes on nontraded goods and taxes on incomes

1/ It should be recalled that in this situation it is necessary (a) that the public sector of the country transfers resources (interest payments) to foreign creditors, and (b) that the private sector of the country transfers resources to the public sector. Thus, the trade account must be in surplus and the fiscal account (properly measured) must improve.

2/ Chile was very successful in raising alternative (noninflationary) sources of revenue, especially through a broad-based value-added tax (which is now among the most productive in the world) and through adjustments in the tariffs of the public enterprises. See (Corbo, 1988).

3/ In this case high inflation may result and this will make it more difficult to ascertain the budgetary stance of the government as the conventional measure of the deficit will likely be in deficit but it will give indications that are not fully reliable. See (Ortiz, 1988).

and property will have to replace taxes that are import-related. Also, especially in these cases, public enterprises must become major revenue sources for the government rather than drains on government budgets.

V. Tax Revenue and Inflationary Policies

When the government contributes to inflation by financing part of its overall expenditure through money creation, it affects tax revenue in various ways. In developing countries where progressive income taxes collected on a pay-as-you-go system are not important, where specific taxes play a significant role, and where collection lags are generally sizable, inflation is likely to have a negative impact on real tax revenue. ^{1/} In these countries there is little scope for "fiscal drags" so that the effect of inflation on tax revenue is unambiguously negative.

The existence of collection lags for all tax payments implies that, under inflationary conditions, there is likely to be a real revenue loss to the government that is a direct function of the rate of inflation, the size of the lag, and the initial level of taxation. The longer is the collection lag, and the higher is the rate of inflation, the greater will be the percentage reduction in the preinflation tax level.

The impact of different lags and rates of inflation on the real value of one unit of tax revenue can be estimated by multiplying that

unit by $\frac{1}{(1 + p)^n}$ where p is the monthly rate of inflation and n is

the collection lag, expressed in months. With the assumption that the elasticity of the tax system is unitary, the effect of inflation on the tax burden can be calculated by solving the following equation:

$$T^\pi = \frac{T_0}{(1 + p)^n} = \frac{T_0}{(1 + \pi)^{n/12}}$$

where, T_0 denotes the ratio of tax revenue to national income under zero inflation; T^π denotes that ratio when the rate of inflation is π ; and n denotes the collection lag, while p and π denote the rate of inflation on a monthly and on an annual basis, respectively.

In countries where the average lag for the whole system is long, the rate of inflation is high, and the initial level of taxation is also high, the absolute revenue loss, measured as a proportion of national

^{1/} See in particular (Tanzi, 1977).

income, can be very high. ^{1/} For example, a country with a ratio of tax revenue to GDP equal to 30 percent which faces a rate of inflation of 40 percent per year will lose 1.6 percent of GDP in revenue if the lag is two months and 4.6 percent of GDP if the average lag is six months (see Table 1). ^{2/} With a six-month lag and an inflation rate of 100 percent per year this country would lose almost 9 percent of its initial GDP in revenue (see Tanzi, 1978). Table 1 provides simulation results obtained solving the above equation for situations where the zero-inflation tax ratio varies from 0.10 of GDP to 0.40 percent of GDP, while the collection lag varies from two months ($n = 2$) to eight months ($n = 8$). Table 1 shows how quickly a country with an initially high tax ratio (at zero inflation) and a sizable collection lag can experience a dramatic drop in the level of taxation when the rate of inflation accelerates. ^{3/}

For a few countries for which, over the years, the author has estimated the average lag for the whole tax system (Argentina, Jamaica, Morocco), the lag was found to vary between four and six months. ^{4/} Large tax revenue gains are thus likely to accompany policies that reduce the rate of inflation or reduce the size of the average collection lag, especially when the zero-inflation tax level would be high. This revenue-increasing effect associated with a slowdown of the rate of inflation was very important in the so-called "heterodox" stabilization programs of Argentina, Bolivia, and Israel. However, if the government has taken successful steps to reduce the impact of inflation on the tax system, the increase in the tax to GDP ratio associated with a fall in inflation is likely to be smaller unless the rate of inflation had been very high. In Brazil, for example, the impact of the Cruzado Plan on the ratio of tax revenue to GDP was smaller than in the other countries since Brazil had been more successful than the others in insulating its tax system from the

^{1/} If the initial level of taxation, as a percent of GDP, is lower the absolute revenue loss will also be lower. Therefore, it makes a difference whether a country starts with a high or low tax level.

^{2/} The results in Table 1 have been calculated using the above equation. See (Tanzi, 1978) for details.

^{3/} The opposite will be true when the rate of inflation decelerates.

^{4/} In Argentina, the Government took steps to reduce it so that the collection lag is now somewhat shorter. It is also likely to have changed, since those estimates were made, in the other two countries mentioned. This average lag is influenced by the different lags of the various taxes and by the relative importance of each tax (see Tanzi, 1977).

TABLE 1. INFLATION AND REVENUE FROM TAX SYSTEM ¹
(Ratios of total tax revenue to gross domestic product)

π	T ₀ = 0.1				T ₀ = 0.2				T ₀ = 0.3				T ₀ = 0.4			
	n = 2	n = 4	n = 6	n = 8	n = 2	n = 4	n = 6	n = 8	n = 2	n = 4	n = 6	n = 8	n = 2	n = 4	n = 6	n = 8
5	0.099	0.098	0.098	0.097	0.198	0.197	0.195	0.194	0.298	0.295	0.293	0.290	0.397	0.394	0.390	0.387
10	0.093	0.097	0.095	0.094	0.197	0.194	0.191	0.188	0.295	0.291	0.286	0.282	0.394	0.387	0.381	0.375
15	0.093	0.095	0.093	0.091	0.195	0.191	0.187	0.182	0.293	0.286	0.280	0.273	0.391	0.382	0.373	0.364
20	0.097	0.094	0.091	0.089	0.194	0.188	0.183	0.177	0.291	0.282	0.274	0.266	0.388	0.376	0.365	0.354
25	0.096	0.093	0.089	0.086	0.193	0.186	0.179	0.172	0.289	0.278	0.268	0.259	0.385	0.371	0.358	0.345
30	0.096	0.092	0.088	0.084	0.191	0.183	0.175	0.168	0.287	0.275	0.263	0.252	0.383	0.367	0.351	0.336
35	0.095	0.090	0.086	0.082	0.190	0.181	0.172	0.164	0.285	0.271	0.258	0.246	0.380	0.362	0.344	0.327
40	0.095	0.089	0.085	0.080	0.189	0.179	0.169	0.160	0.284	0.268	0.254	0.240	0.378	0.358	0.338	0.320
45	0.094	0.088	0.083	0.078	0.188	0.177	0.166	0.156	0.282	0.265	0.249	0.234	0.376	0.353	0.332	0.312
50	0.093	0.087	0.082	0.076	0.187	0.175	0.163	0.153	0.280	0.262	0.245	0.229	0.374	0.349	0.327	0.305
60	0.092	0.085	0.079	0.073	0.185	0.171	0.158	0.146	0.277	0.256	0.237	0.219	0.370	0.342	0.316	0.292
70	0.092	0.084	0.077	0.070	0.183	0.168	0.153	0.140	0.275	0.251	0.230	0.211	0.366	0.335	0.307	0.281
80	0.091	0.082	0.075	0.068	0.181	0.164	0.149	0.135	0.272	0.247	0.224	0.203	0.363	0.329	0.298	0.270
90	0.090	0.081	0.073	0.065	0.180	0.161	0.145	0.130	0.270	0.242	0.218	0.196	0.359	0.323	0.290	0.261
100	0.089	0.079	0.071	0.063	0.178	0.159	0.141	0.126	0.267	0.238	0.212	0.189	0.356	0.317	0.283	0.252
120	0.088	0.077	0.067	0.059	0.175	0.154	0.135	0.118	0.263	0.231	0.202	0.177	0.351	0.308	0.270	0.236
140	0.086	0.075	0.065	0.056	0.173	0.149	0.129	0.112	0.259	0.224	0.194	0.167	0.346	0.299	0.258	0.223
160	0.085	0.073	0.062	0.053	0.171	0.145	0.124	0.106	0.256	0.218	0.186	0.159	0.341	0.291	0.248	0.212
180	0.084	0.071	0.060	0.050	0.168	0.142	0.120	0.101	0.253	0.213	0.179	0.151	0.337	0.284	0.239	0.201
200	0.083	0.069	0.058	0.048	0.167	0.139	0.115	0.096	0.250	0.208	0.173	0.144	0.333	0.277	0.231	0.192
250	0.081	0.066	0.053	0.043	0.162	0.132	0.107	0.087	0.243	0.198	0.160	0.130	0.325	0.263	0.214	0.174
300	0.079	0.063	0.050	0.040	0.159	0.126	0.100	0.079	0.238	0.189	0.150	0.119	0.317	0.252	0.200	0.159
350	0.078	0.061	0.047	0.037	0.156	0.121	0.094	0.073	0.233	0.182	0.141	0.110	0.311	0.242	0.189	0.147
400	0.076	0.058	0.045	0.034	0.153	0.117	0.089	0.068	0.229	0.175	0.134	0.103	0.306	0.234	0.179	0.137
450	0.075	0.057	0.043	0.032	0.151	0.113	0.085	0.064	0.226	0.170	0.128	0.096	0.301	0.227	0.171	0.128
500	0.074	0.055	0.041	0.030	0.148	0.110	0.082	0.061	0.223	0.165	0.122	0.091	0.297	0.220	0.163	0.121

Source: Tanzi, 1978.

¹ π denotes the yearly inflation rate.

T₀ denotes the ratio of total tax revenue to gross domestic product at zero inflation rate.

n denotes the average collection lag for the tax system.

negative effects of inflation. 1/ Thus, that success became a negative factor during the Cruzado Plan.

The level of tax revenues is affected by inflationary policies also because some important excise taxes (tobacco, alcohol, and even fuel) and even some import duties are at times imposed with specific rates. 2/ As these rates are often not adjusted in line with inflation, the government experiences revenue losses when prices are rising.

Inflation often brings about an appreciation of the exchange rate as the latter is not adjusted in line with the change in prices. Furthermore, the official rate of inflation may lag behind the actual or real rate if the government is regulating prices or if the price index is not fully representative. Therefore, the problems discussed in Section II, in connection with the exchange rate, are also relevant in this context. Furthermore, a few countries use administrative prices to determine the value of imports. These are price lists provided to customs officers which are changed only periodically. These prices are used to facilitate the task of determining import values. With inflation the prices in these lists tend to lag behind where they should be even though the exchange rate itself may be adjusting in line with the rate of inflation. 3/

Finally, a reference should be made to the prices that public utilities charge on the goods and services that they sell even though, strictly speaking, these are not "taxes." It is a common experience that these prices tend to lag behind the rate of inflation even when the official measure of this rate is reduced by price controls, overvalued exchange rates, and so forth. The countries' authorities often attempt to hold down the rate of inflation by not increasing public utility

1/ This had been achieved by reducing the length of collection lags and by indexing the tax liabilities. However, complete protection against high inflation does not seem feasible since perfect indexation is not possible. For an analysis of these aspects within the Brazilian context and for the steps taken since 1985 to reduce the impact of inflation on tax revenue, see (Giambiagi, 1987).

2/ Alcohol, tobacco, and petroleum products generate about 10 percent of total tax revenue and more than 70 percent of total excise taxes in developing countries, see (Tanzi, 1987).

3/ The effects of inflation on tax revenue discussed above can be described as first round, or major effects. However, inflation can affect tax revenue in many other ways. For example, it is well known that inflation affects relative prices. If sectors that are differently taxed respond differently to the rate of inflation, tax revenue will be affected. Also, if government is controlling prices, it will be more successful in controlling the prices of commodities (that are more heavily taxed) than the prices of services that are more lightly taxed. Also, inflation may have a negative impact on real income.

prices. Even when, at intervals, these prices may be brought into line with the price index there is likely to be some real revenue loss in-between adjustments especially when the inflation rate is high.

This discussion, oriented toward developing countries, has highlighted the negative revenue effects of inflation on tax revenue. However, if a country is highly dependent on income taxes collected with progressive rates and withheld at the source, and if the acceleration in the rate of inflation is moderate, the country would experience inflation-induced revenue increases rather than decreases. This was the experience in many industrial countries in the 1970s. This is what is normally called the "fiscal drag" in industrial countries. ^{1/} Still the basic point of the paper remains valid. Macroeconomic policies pursued independently of tax policy often have important and relatively direct influences on tax revenue and, through these, on the overall incidence of the tax system.

VI. Tax Revenue and Interest Rate Policies

Interest rate policies have also important and direct tax revenue implications. When interest incomes are paid by financial institutions, they can generally be checked with relative ease by the authorities and the taxes on them can be withheld at the source.

In many countries interest incomes represent the second major income tax base and the second source of income tax revenue after wages. Therefore, a country's level of taxation will be affected positively when governments pursue policies that encourage savers to channel their financial savings to financial institutions. Often, however, governments attempt to maintain interest rates at levels which make them unattractive to savers. This is especially true in periods of high inflation. ^{2/} Under these circumstances, one is likely to observe a progressive exodus of financial savings away from the financial institutions and toward difficult-to-tax domestic and foreign channels. This disintermediation will often have significant tax consequences. Which are these channels?

^{1/} For a detailed review of these aspects, see (Tanzi, 1980). Should the rate of inflation become very high in the industrial countries, they would also experience falls in the ratios of taxes to national incomes. The industrial countries' collection lags are also significant (see OECD, 1983).

^{2/} This is especially the case when the tax laws do not make a distinction between real interest incomes and the part of interest payments that compensates the lenders for the erosion of their capital. Thus, as inflation accelerates, the net-of-tax real interest rates will fall even when the before-tax nominal rates are keeping up with the inflation rate.

First of all there is always the option of the informal financial sector or the so-called "curb markets." These markets are important in developing countries (see Chandavarkar, 1986). Here, individuals avoid official institutions and borrow and lend directly from each other. As a consequence, the government loses part of its tax base.

Second, some individuals channel their savings toward the purchase of real assets, including durables and inventories, for which the implicit nominal rate of return is not taxable. This hoarding of real goods is costly to the country as well as to the tax administration.

Third, in many countries one observes the already mentioned process of "dollarization" or currency substitution whereby savers channel more and more of their financial savings toward dollar bills physically held in the country. This reduces the seignorage that the country's monetary authorities can collect from currency creation and transfers that seignorage to the U.S. Federal Reserve System. A recent survey by the U.S. Federal Reserve Board indicated that a large proportion of all U.S. dollar bills in circulation was probably held outside the United States. In Argentina some economists have estimated that in recent years the total amount of dollar bills in the country might have been as high as \$5 billion. 1/ In that country and in some other countries, payments for real estates transactions are routinely made in dollar bills, thus facilitating the evasion of taxes on property transfers.

Fourth, when real interest rates (after taxes) become unattractive, individuals have a strong incentive to take their money out of the country. In this case the tax base is essentially transferred to another country. In addition, since the government will be unable to borrow domestically, it will rely more on foreign borrowing thus accumulating foreign debt. Thus, capital flight and a growing foreign debt may be two aspects of the same problem. 2/ Since interest payments on externally-held debt are, by contractual arrangements, normally tax-free in the debtor countries (while the creditor countries can tax the earnings of the commercial banks which receive the interest payments), there is a further transfer of the tax base. This transfer is in direct proportion to the size of the foreign debt. In some countries, it now represents a significant portion of the tax base. 3/

While interest incomes progressively vanish from the tax base, interest deductions by borrowers continue to be an important drain on

1/ If this figure is correct, it implies that the yearly seignorage that Argentina was paying to the United States may have been at least \$400 million at current rates of interest.

2/ The higher level of public debt is likely to signal a higher future level of taxation. This may cause even more capital flight and smaller domestic tax bases. See (Ize and Ortiz, 1986).

3/ If the debt was domestic, in principle at least, it would have remained part of the tax base.

tax revenue; those who make payments will continue to deduct fully these payments from their gross earnings in order to determine their taxable incomes. They will do so even when they borrow from the curb market or from abroad.

The savers of many developing countries have taken their money to the United States, where they can claim a "nonresident alien," nontaxable status, or to so-called tax havens. At times they may have loaned the money back to enterprises that they control in their own countries anonymously through their foreign banks. The interest payments by these enterprises are then deductible for tax purposes. ^{1/} The tax administrations of the developing countries often do not have the resources to ascertain whether the deductions claimed by the enterprises are reported as equivalent interest incomes by those who receive the payment even when these are paid domestically. ^{2/}

In many developing (and developed) countries, debt management policy may have become another macroeconomic policy that has reduced the tax base. To encourage individuals to hold government bonds at lower rates of interest, the government has, in many cases, accorded to those bonds a tax-free status. As the size of the public debt rises as a share of national income, and as more and more private savings are invested in those tax-free bonds, the tax base is further reduced.

VII. Concluding Remarks

This paper has dealt with an aspect of taxation that has been largely ignored by the literature on the determinants of tax levels, namely, the impact of macroeconomic policies on tax revenue. Various policies have been discussed: those related to the exchange rate and to trade restrictions; those related to the financial market; and, those related to inflationary finance. These policies were shown to be important determinants of tax revenue. These are, of course, not the only policies that have these effects but they are probably the most important.

A more comprehensive paper would have discussed the effects of other policies. For example, pricing policies that reduce the profits of private enterprises reduce taxes on profits. Wage policies that maintain wages above (below) the level that they would have reached without those policies have positive (negative) effects on wage taxes but negative (positive) effects on profit taxes. Furthermore, to the extent that high wages bring about higher unemployment, some additional negative effects can be identified. Rent control laws that reduce

^{1/} This was a problem in Mexico until the recent tax reform.

^{2/} U.S. tax laws have come under some criticism for facilitating this transfer of tax bases from developing countries to the United States. For a recent survey of this issue, see (McLure, 1988).

rental incomes also reduce the tax base for both income taxes and possibly property taxes. A large public enterprise sector that, because of pricing or other policies, does not make profits will also depress the level of taxation.

These examples indicate that this is a complex and important area that deserves much more attention than it has received so far. They also indicate that countries that wish to raise their level of taxation through tax reform may have limited success when they are at the same time pursuing macroeconomic policies that may largely neutralize the potentially positive effects coming from tax policy changes and from improved tax administration. In these cases those who were engaged in the tax reform may be blamed for the lack of success. ^{1/} Tax reform is likely to be most successful in raising revenue in a stable or improving macroeconomic environment. When that environment is not stable, tax reform must be directed toward insulating the tax system from the negative shocks that may come from macroeconomic policy. For example, in situations where a large foreign debt is likely to reduce the volume of imports, or where the government insists in pursuing a policy that keeps the exchange rate overvalued, it would be desirable to reduce the dependence of the tax system on the external sector. In conclusion, good tax reform cannot be made if the macroeconomic situation is not taken fully into account.

One final comment may be appropriate. In our discussion we have dealt separately with various macroeconomic policies and have assessed their probable impact on tax revenue. This partial analysis approach, however, may not be appropriate in analyzing concrete situations. In reality, the effects discussed above may occur jointly and may influence each other. For example, assume that devaluation leads to inflation, perhaps because of indexation arrangements in the economy. ^{2/} In such case the positive effects of devaluation on tax revenue that were identified above may to some extent be neutralized by the negative effect of inflation on tax revenue. These interactions of policies must be kept in mind when the analysis of this paper is applied to a real world situation.

^{1/} Falls in tax revenue are often attributed to "deteriorating tax administration" when in fact they may simply be the consequence of misguided macroeconomic policies.

^{2/} In a recent analysis of high-inflation cases, Peter Montiel has concluded that "nominal exchange rate shocks played the dominant role in triggering an acceleration of inflation," see (Montiel, 1988). See also (Rodrigues, 1978.)

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