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# The Economics of the Government Budget Constraint

Stanley Fischer

Large budget deficits pose real threats to macroeconomic stability and therefore to growth and development. Large deficits will, perhaps after some time, lead to inflation, exchange crises, external debt crises, and high real interest rates.

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Excessive budget deficits can lead to inflation, exchange crises, external debt crises, and high real interest rates — with implications for the real exchange rate, the trade account, and investment. But the links are not automatic, for there are choices in the sources of financing — and lags in the effects of money printing and borrowing on inflation and interest rates.

Nor are moderate budget deficits to be avoided at all costs. Small deficits can be financed without creating excessive inflation, exchange crises, or an excess buildup of debt. If the real interest rate exceeds the growth rate of GNP, no primary deficit larger than the maximum amount of seignorage revenue (the revenue from printing money) the government can obtain is sustainable. Governments cannot use seignorage permanently to finance primary deficits over 2.5% of GNP without expecting inflation to accelerate — and even seignorage of 2.5% of GNP would be sustainable only in a rapidly growing economy.

Whether any particular path of fiscal policy is sustainable has to be checked through projections of the debt-to-GNP ratio. A given deficit is more likely to be sustainable the higher the growth rate of output.

Of course, the fact that a fiscal policy is sustainable does not mean that it is optimal. A fiscal deficit crowds out private investment — and it might well be desirable to reduce the debt-to-GNP ratio to crowd private investment in.

Similarly, it is not optimal to collect the maximum possible amount of revenue from seignorage, but rather a smaller amount corresponding to a lower inflation rate.

Theory and evidence both warn that large budget deficits pose real threats to macroeconomic stability and therefore to economic growth and development.

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by  
Stanley Fischer

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This paper is a slightly revised version of a paper presented at the Zahid Husain Memorial Lecture at the State Bank of Pakistan, Karachi, March 2, 1989. Collaboration from William Easterly of the Macroeconomic Adjustment and Growth Division and useful comments from Bela Balassa and Johannes Linn are gratefully acknowledged.

The topic of this Zahid Husain Memorial Lecture, the economics of the government budget constraint, is not the most obvious choice for a central bank audience. Surely it would be more appropriate to talk of the staple questions of monetary policy, whether to target the money stock or rates of return on assets, whether to fix the exchange rate or allow it to float, and if to fix it, to what currency basket, how to maintain prudential control of the financial system while obtaining the beneficial effects of competition, and so forth.

One interpretation would be that the choice of topic is dictated by prudence. Central bankers know that fiscal deficits are the ultimate source of macroeconomic instability and inflation, while finance ministers are more inclined to attribute their macroeconomic problems to inadequate monetary policy; there is therefore nothing safer than talking about the dangers of fiscal excess in a central bank. But prudence is not consciously the reason for choosing this topic. Rather it is that fiscal policy is indeed key to macroeconomic stability and one of the keys to development -- and that recent developments in the analysis of the consequences of deficit finance reinforce that message.

When government spending and taxation amount as they do in many industrialized economies to around 40% of GNP, it is inevitable that tax and expenditure decisions exert a major impact on the allocation of resources. Government spending in low-income developing countries averages 20% of GNP<sup>2</sup>, still quite sufficient to affect the allocation of resources throughout the economy. The method of financing of that spending also affects the allocation of resources, both because taxes and tariffs affect relative prices, and also because the financing of the government budget deficit affects inflation, real interest rates, the internal and external debt, and the development of the financial system.

Crucial as these allocative effects of fiscal policy are, I shall concentrate in this lecture on the macroeconomic effects of government budget deficits, focussing on the consequences of different methods of financing the deficit, and the links between the budget deficit and inflation. The lecture is built around three simple relationships: the national income accounts budget deficit identity; the budget deficit financing identity; and the dynamic equation for the evolution of the debt to GNP ratio.

### I. Macroeconomic Effects of the Deficit: Standard Analysis.

The Keynesian revolution brought the budget deficit out of the closet as a macroeconomic variable. While governments had run budget deficits without the aid of Keynesian theories before, the pre-Keynesian

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<sup>2</sup>World Development Report 1988, Chapter 2, contains comparative data on government revenues and expenditure. The Report presents an authoritative modern account of the role of fiscal policy.

presumption was that the budget should generally be balanced, or perhaps even in surplus in peacetime in order to pay off the government debt generated by wartime deficits. The devotion to balanced budgets is evident from the desire of political candidates and governments to balance the budget even during the Great Depression. Though few succeeded in balancing the budget, some governments raised tax rates during that period.

One of the contributions of Keynes was to provide a framework--one which we now recognize to be incomplete--in which it is possible to analyze the question of how the deficit should behave. The earliest emphasis was on fiscal policy and the deficit as components of aggregate demand. From that perspective, Keynesians saw no need to balance the budget during periods of recession. Instead the notion of the cyclically balanced budget, that the budget should be in balance on average over the business cycle, in surplus during booms and in deficit during recessions, was developed as a norm for fiscal behavior.

There were of course well-known refinements to this conception. In the first instance, the balanced budget multiplier shows that the deficit is not an unambiguous measure of the impact of fiscal policy on aggregate demand; given the budget deficit, an equal increase in government spending and revenues increases aggregate demand. Second, the budget deficit is itself endogenous, affected by the state of the economy as well as affecting it. As a result, the notion of the full employment, or high employment, or structural deficit was developed. This estimates the size of the budget deficit as it would be if output were at the full employment level<sup>3</sup>.

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<sup>3</sup>Appendix 1 contains a discussion of budget deficit measurement and definitions.

Once the threat of widespread post-World War II unemployment had receded, the emphasis shifted from aggregate demand to the effects of fiscal policy on the components of demand. Here the overall saving-investment identity or resource constraint facing the economy is a useful guide to analysis:

$$(1) \quad \text{Budget deficit} = (\text{Saving} - \text{Investment}) + (\text{Current account deficit})$$

Since equation (1) is an identity, there is not much arguing with it<sup>4</sup>. To illustrate its uses, suppose the economy is at full employment, and take the rate of saving as given. Equation (1), the saving-investment identity, then implies the crowding-out problem: an increase in the budget deficit will result in either a reduction in investment or an increase in the current account deficit. Until this decade, textbooks--at least U.S. textbooks--tended to emphasize the possibility of crowding out investment. The clear relationship in this decade between the U.S. budget deficit and its trade deficit has reminded us that there are two terms on the right hand side.

It would be a mistake though to overcompensate by assuming there is an automatic one-to-one link between the budget and trade deficits<sup>5</sup>. To take one example, the U.K. has been running a large trade deficit in recent months while maintaining a strong fiscal position. The effect on the trade deficit of a reduction in the budget deficit depends on the accompanying

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<sup>4</sup>It is however necessary to define terms consistently; the budget deficit in (1) is that of the consolidated public sector, and saving and investment are those of the private sector.

<sup>5</sup>Balassa (1988) finds a high correlation between budget deficits and trade deficits in the developed but not the developing countries.

monetary policy and its impact on the exchange and real interest rates. Fiscal contraction accompanied by monetary easing would reduce the interest rate and lead to a depreciation of the exchange rate, thus tending to increase investment while reducing the trade deficit.

The standard Keynesian analysis of the impact of fiscal policy has been affected by two important theoretical developments. The first is the more sophisticated model of saving behavior that emerges from the life-cycle and permanent income theories of consumption of Modigliani and Friedman. To this point we have implicitly taken the rate of saving as determined by the level of disposable income, and have not focussed on the link between the budget deficit and saving. The life cycle and permanent income theories both relate current consumption to a measure of permanent or life-time disposable income. Accordingly, a current change in taxes that does not change the present value of taxes should not, *ceteris paribus*, reduce current consumption. Thus a temporary tax change should have a smaller effect on consumption than a permanent tax change. This of course implies that the impact of changes in the budget deficit on spending is affected by expectations of the permanence of the deficit.

Pursuing the argument to its logical conclusion, Barro (1974) showed that under a very specific set of assumptions, lump-sum changes in taxes would have no impact on consumer spending. Equivalently, and this is a more striking statement, a cut in taxes that increases disposable income, would automatically be accompanied by an identical increase in saving. This is the so-called Ricardian equivalence result, that deficits and taxes are equivalent in their effects on consumption.

The explanation is quite simple: the far-seeing consumer recognizes that the government debt generated through deficit spending will eventually be paid off by increased taxes, the present value of which is exactly equal to the present value of the reduction in taxes. Taking the implied increase in future taxes into account, he or she saves the amount necessary to pay them.

The potential empirical importance of the Ricardian equivalence hypothesis cannot be exaggerated. If the hypothesis holds, then budget deficits do not affect national saving, nor interest rates, nor the balance of payments, and nor does the method of financing of social security affect capital accumulation. In terms of equation (1), the hypothesis implies that an increase in the budget deficit would, under certain circumstances, be accompanied by an increase in private saving--and that both investment and the trade balance would therefore be unaffected.

Despite the sharpness of its predictions, it has not been possible to reject Ricardian equivalence sufficiently decisively to persuade proponents of the theory<sup>6</sup> to change their views. Others regard the evidence as sufficient to rule out Ricardian equivalence as more than an extremely interesting theoretical possibility. I believe the evidence, including that from the United States in this decade, still supports the view that tax cuts increase aggregate demand, though the impact does depend on expectations of the permanence of the change.

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<sup>6</sup>Bernheim (1987) reviews and extends the theory and evidence, arguing strongly against Ricardian equivalence.

The second development takes off from the extremely short-run nature of the Keynesian analysis of fiscal policy. Because asset stocks are assumed fixed in the Keynesian model, the consequences of the method by which the budget deficit is financed are not pursued.

## II. Financing the Budget Deficit.

There are four ways of financing the public sector deficit: by printing money, running down foreign exchange reserves, borrowing abroad, and borrowing domestically. The public sector in this case is defined to exclude the central bank, whose profits from the printing of money are treated as a financing source. In a word equation<sup>7</sup>:

$$(2) \quad \text{Budget deficit} = \text{Money printing} + (\text{foreign reserve use} \\ + \text{foreign borrowing}) + \text{domestic borrowing}$$

The terms on the right hand side can be grouped in different ways. For instance, the parentheses around the foreign components emphasize the link between the budget deficit and the trade account, as in equation (1). Alternatively, parentheses could be placed around (money printing + foreign reserve use), which is equal to domestic credit creation; this emphasizes that domestic credit creation is the alternative to borrowing.

To a useful first approximation, we can associate each of the forms of financing in equation (2) with a major macroeconomic imbalance. Money printing is associated with inflation; foreign reserve use is associated

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<sup>7</sup>In both equations (1) and (2), government revenue from the printing of money is treated as a financing source. Private saving in equation (1) is defined to include additions to money holding.

with the onset of exchange crises; foreign borrowing is associated with an external debt crisis; and domestic borrowing is associated with higher real interest rates and possibly explosive debt dynamics. The first approximation is however not the entire story, for there are important links between these problems: for instance between foreign exchange use and external debt crises; and between domestic borrowing and inflation. In the next section we focus particularly on the deficit-inflation link.

We now examine each of the methods of deficit financing and its consequences.

#### Money printing.

It is straightforward to relate the creation of base money to inflation in the usual monetarist way. The printing of money at a rate that exceeds the demand for it at the current price level creates excess cash balances in the hands of the public. The public's attempts to reduce excess cash holdings eventually drive up the overall price level, until equilibrium is restored. Of course, the link between money and prices is not precise: initially an increase in the real money stock may reduce interest rates, particularly in a low-inflation economy.

The amount of revenue that the government can expect to obtain from the printing of money is determined by the demand for base or high-powered money in the economy, the real rate of growth of the economy, and the elasticity of the demand for real balances with respect to inflation and income. Assume for convenience that the income elasticity of the demand for base money is unity. Assume also that the currency to GNP ratio is 13%, as it is in Pakistan--this is high by international standards<sup>8</sup>.

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<sup>8</sup>I have changed here from high-powered money to currency, because rediscounts to the banking system of about 6% of GNP effectively reduce the base on which the government earns seignorage.

Then for every one percentage point that GNP increases, the government can obtain 0.13 percentage points of GNP in revenue through the printing of money that just meets the increased demand for real balances. At an annual growth rate of 6.5%, the government should be able to obtain nearly 0.9% of GNP for financing the budget deficit through the non-inflationary printing of money, increasing the high-powered money stock at an annual rate of 6.5%.

Beyond that rate of growth, and given a stable demand function for currency, inflation will result. If the ratio of base to GNP were invariant to the inflation rate, it would be easy to estimate the amount of revenue collected at different inflation rates. For instance, at a 10% inflation rate the government would be able to finance an extra 1.3% of GNP of budget deficit through seignorage, the government's right to print money.

However, the demand for high-powered money declines as the inflation rate rises. Eventually the government's revenue from seignorage reaches a maximum, as seen in Figure 1. Thereafter increases in the growth rate of money lead to more inflation and less revenue. In this situation there is a true Laffer curve: beyond point A in Figure 1, the government can obtain more revenue by printing money less rapidly.

At what rate of inflation is the government's revenue from money printing maximized? The historical record shows average (not maximum) rates of seignorage of about 1% of GNP for the industrialized countries, and less than 2.5% of GNP for the developing countries (Fischer, 1982). Estimates of the inflation rate at which the maximum rate of seignorage is

attained range from 30% to more than 100%. However, these estimates are misleading, for there are lags in the process of adaptation of money demand to inflation. In the very short run of a few days or weeks, the government can almost always increase its revenue by printing money more rapidly. But the longer a process of high inflation continues, the more the demand for real balances at any given inflation rate declines. People find other ways of doing business, especially by transacting in foreign currencies.

The dynamic process associated with high inflation, in the high double digits, is inherently unstable. The government may initially obtain large amounts of revenue, perhaps even 7-8% of GNP by increasing the money stock rapidly. But as the inflation proceeds and individuals find ways of reducing their holdings of local currency, the government has to print money more rapidly to obtain the same revenue. Thus it is safe to argue that rates of seignorage of much more than 2.5% of GNP would not be sustainable, and that even that rate would only be possible in a very rapidly growing economy.

In the extreme cases, reliance on seignorage revenue to finance the deficit leads to hyperinflation. A recent example is Bolivia in 1984-85. Inflation in Bolivia soared to over 11,000 percent in 1985, although revenue from currency creation fell to 8% of GDP in 1985 from 14% of GDP in 1984. But Bolivia is only one extreme example, and many other governments--including recently Nicaragua and Peru--have suffered from the same phenomenon in recent years, as well as during the great hyperinflations. The instability of the process is reinforced by the decline in the efficiency of the tax system as the inflation rate rises, the so-called Keynes-Tanzi effect (Tanzi, 1977).

Reserve use.

The second means of financing the government budget deficit is to run down foreign exchange reserves. By running down reserves instead of printing money, the government can hope for a time to mitigate the inflationary effects of a deficit. This policy appreciates the exchange rate relative to the level it would otherwise have had. The policy of slowing the rate of exchange depreciation to slow down inflation (carried out not only through reserve use but also through increased foreign borrowing) is one that has been tried time and again, and one that cannot be maintained unless the essentials, namely fiscal policy, are made compatible with the lower inflation.

Use of international reserves to finance the deficit has a clear limit. Private sector anticipation that the limit is about to be reached can provoke capital flight and a balance of payments crisis, since exhaustion of reserves will be associated with currency devaluation. The devaluation that takes place in response to a run on the currency may be blamed on speculators, but is most likely an entirely rational private sector response to unsustainable public policies (see Krugman, 1979).

This is a plausible explanation for the event that precipitated the debt crisis -- the exhaustion of reserves in Mexico in August 1982<sup>9</sup>. A loss of fiscal control resulted in deficits of 14% of GDP in 1981 and 18% in 1982. Capital flight was proceeding at the rate of \$7 billion a year over the 1979-82 period. Finally, a speculative attack on the remaining

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<sup>9</sup>Of course, the exhaustion of Mexican reserves was not the underlying cause of the debt crisis.

reserves took place in August 1982, leading to the suspension of payments and the beginning of the rescheduling process.

Foreign borrowing.

The third method of financing the public sector deficit is direct foreign borrowing. As in the case of reserve use, recourse to foreign borrowing tends to appreciate the exchange rate, damaging exports and encouraging imports. The dangers of excessive reliance on external borrowing to finance the budget deficit, and of large budget deficits, are convincingly illustrated by the debt crisis. Most, though not all, of the countries that developed debt servicing difficulties were running excessively large public deficits. Past overborrowing and the perception of uncreditworthiness of most major borrowers have caused this source of finance to be severely limited for most highly-indebted countries at present.

We have already noted that there is no necessary link between budget deficits and trade deficits. Budget deficits can be financed by printing money and by domestic borrowing. However when domestic capital markets are thin, and domestic borrowing possibilities limited, a situation that exists in some developing countries, the link between the budget deficit and external borrowing is more likely to be close. For example, large fiscal deficits (between 7 and 11% of GDP) in Bangladesh during the 1980s have been mirrored in sizeable current account deficits. Recent fiscal adjustment through expenditure cutbacks have resulted in a substantial current account improvement. Looking at the relationship in the reverse direction, reductions in the availability of external

financing, as for some of the debtor countries, force either fiscal contraction or inflation.

Domestic borrowing.

The final form of finance, available to some developing countries, is issuance of domestic debt. This is usually intermediated by the banking system, although in a few cases, such as Mexico and Brazil, government bonds have been sold directly to the private sector. To be considered nonmonetary debt, borrowing from the banking system must not be financed by central bank rediscounts. While government domestic borrowing is often thought of as a way to avoid both inflation and external crises, it carries its own dangers if used to excess--a point to which we turn below. By definition, government borrowing reduces the credit which would otherwise be available to the private sector, putting pressure on domestic interest rates.

In countries as diverse as Turkey and Thailand, reliance on domestic debt has indeed brought high real domestic interest rates. In Turkey the real domestic lending rate reached 50 percent in 1987. More moderate domestic borrowing in Thailand led to real lending rates ranging from 15 to 19 percent during the 1982-86 period.

Where interest rates are controlled, domestic borrowing still leads to credit rationing and crowding out of private sector investment. If the economy is well integrated with international capital markets, then government domestic borrowing will tend to push the private sector into borrowing more abroad.

We turn now to debt dynamics, to evaluate the stability of that process.

### III. Debt Dynamics.

To examine the long-term consequences of running deficits, we use identity (3), which shows the determinants of the change in government debt. It is most useful to concentrate on the ratio of the debt to a measure of the scale of the economy; accordingly we focus on the ratio of government debt to GNP, which we denote  $b$ . Debt is now defined to include both the net external and domestic debts. In terms of equation (2), we consolidate foreign and domestic borrowing, and treat changes in foreign reserves as equivalent to net external borrowing.

The change in the debt ratio ( $b$ ) is equal to the non-interest (or primary) deficit of the total public sector, minus the part that is financed by printing money, plus the current debt ratio ( $b$ ) times the average real interest rate on the debt minus the growth rate of GNP (this is the last term in (3)):

$$(3) \quad \text{Change in } b = (\text{Primary deficit}/\text{GNP}) - (\text{Seignorage}/\text{GNP}) \\ + (\text{Real interest rate} - \text{growth rate}) \times b$$

This equation, which is the key to understanding debt dynamics, has a simple intuitive explanation<sup>10</sup>. The non-interest deficit has to be

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<sup>10</sup>This equation can be derived starting from equation (2), recognizing that the sum of domestic and net foreign borrowing is equal to the change in the government debt, and that the government budget deficit is equal to the primary deficit plus interest payments. A very similar equation is useful for understanding external debt dynamics: in that case the dependent equation is the (foreign) debt to exports ratio, the primary deficit on the right hand side of (3) is replaced by the non-interest current account deficit, there is no analog of seignorage, and the growth rate on the right hand side is that of exports.

financed with new debt to the extent that this deficit exceeds the amount of money creation by the central bank. In addition, nominal interest expenditures have to be refinanced with new debt. However, the denominator of the debt ratio is nominal GNP, so the debt ratio will decline with either inflation or real GNP growth in the absence of new borrowing.

The dynamics of debt and the sustainability of deficits are particularly affected by the difference between the real interest rate and the growth rate of GNP. Assume first that the real interest rate on debt exceeds the growth rate. Then debt dynamics are unstable. It is not then possible to run a permanent primary deficit that exceeds the amount of revenue the government can obtain through seignorage. The conclusion deserves emphasis: if the government is running a primary deficit larger than the amount of seignorage it can obtain, and if the real interest rate exceeds the economy's growth rate, the debt to GNP ratio will continue rising without limit. At some point it will be impossible for the government to sell its debt, and the process will have to be brought to an end by cutting the budget deficit. The point at which the process has to end depends on the expectations of the public. When the public recognizes the unsustainability of the government's fiscal policy, it will cease buying government debt, and thereby force a change in policy.

The debt dynamics equation (3) has an interesting implication, first pointed out by Sargent and Wallace (1981). Suppose that the government tightens monetary policy by reducing the rate of printing of money and increasing borrowing. The debt increases; either deficits will be higher in future, or the government will have to print more money in

future to keep the deficit constant. If future deficits are to be held constant, then the increased printing of money in future will mean more inflation in future. Generally, the expectation of future inflation increases current inflation. And, as Sargent and Wallace show, it is even possible in certain--though not all--circumstances that the impact of the expected increase in future inflation outweighs that of the lower rate of money printing today, so that an apparently contractionary monetary policy today will increase current inflation.

We have already discussed maximum sustainable rates of seignorage, and have suggested that governments cannot use seignorage permanently to finance primary deficits in excess of 2.5% of GNP without expecting inflation to accelerate--and even that would have to be in a rapidly growing economy.

What happens if the real interest rate is less than the growth rate? This is a world where the painful tradeoffs just discussed do not exist. Debt is eroded over time through growth, so primary deficits in excess of seignorage revenue are sustainable. A so-called Ponzi<sup>11</sup> scheme of borrowing to pay interest is always possible. This certainly seemed to be the case in the late seventies, as high inflation rates produced negative ex post real interest rates. It is also true that real interest rates are very likely to be below the growth rate in economies that are growing rapidly, such as the Asian NIEs.

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<sup>11</sup>Charles Ponzi was a Boston resident who in the 1920s made a fortune through a pyramiding scheme, but who then ended up in jail, and was later penniless.

There are some who believe that the real interest rate should normally be below the growth rate. But an economist's instincts are that such a free lunch is not possible, and the instincts are right. Real interest rates can be temporarily below the growth rate, and could be below the growth rate for a long period in a rapidly growing economy--this is part of the virtuous circle of growth. But market forces tend to prevent the real interest rate from remaining below the real growth rate permanently. As more debt piles up, the pressure on bond markets drives up the interest rate. At the level of the world economy, the normal situation should be thought of as one where the real interest rate exceeds the growth rate.

It might seem that the government could make a Ponzi scheme possible by controlling domestic interest rates. But this is a tax on domestic bond-holders in the amount by which the controlled rate is below the long-run equilibrium rate. Savers respond by taking their savings elsewhere, and the government faces a limit on how much it can borrow. The experiences of countries such as Argentina, Mexico, and Venezuela with interest rate controls and capital flight confirms this limitation. We are back again to the world of tough choices and unforgiving tradeoffs.

#### Sustainable deficits.

Whether the deficit is sustainable depends on its size, and on the growth rate of the economy. Examining equation (3), a higher growth rate allows the government to obtain more revenue by printing money, and it reduces the last term in the equation. Rapid growth permits a larger deficit.

This argument helps explain why countries such as India, Malaysia, Pakistan, and Thailand where growth was at or above 5% over 1980-86, have been able to run sizeable domestic deficits while inflation has been in the single digits, whereas Argentina and Brazil -- with virtually no growth but with smaller inflation-adjusted deficits -- have been plagued with triple-digit inflation. This is not to say that public deficits do not matter in high-growth economies, only that they can be bigger, so long as the growth continues.

Whether a given fiscal policy is sustainable is a question that can be answered by doing detailed projections of the future course of the debt-to-GNP ratio. Equation (3) provides the essential analytic tool; the analysis requires subsidiary assumptions about the demand function for money, the desired inflation rate, the real interest rate, and the growth rate of the economy. If the analysis shows the debt-to-GNP ratio to be rising continually, then the fiscal policy has to be changed.

It is sometimes argued that a deficit that results from high public investment will be sustainable. However, this argument can easily be overdone. In the first instance, while public infrastructure spending often has a very high return, many low-return or no-return items may also be included in the category of "investment". More important, even if public investment has a high return, it is necessary that the government capture the additional returns from the investment if it is to be self-sustaining. For example, suppose that a project yields the remarkably high real return of 15%, that the marginal tax rate is 20%, and that the government borrows at 7% to finance the project. The government will be

receiving only 3% of the cost of the project in tax revenues, even though its social yield is 15% (assuming that the entire social yield is pecuniary). Thus the investment project still adds to future deficits, despite its high yield--though to be sure its impact on future deficits is smaller than that of current government spending financed through deficits.

Economies can proceed for long periods with large deficits, as the Italian economy has. It helps in these cases if the domestic saving rate is high, so that individuals are willing to absorb relatively large amounts of government debt in their portfolios. But the relentless increase in the debt-to-GNP ratio means that even in the Italian case, fiscal policy will eventually have to change..

#### IV Deficits and Inflation.

Our analysis has made it clear that there is no automatic link between budget deficits and inflation. The visitor to high inflation-high deficit economies is often told that the deficit cannot be the cause of inflation because the correlation between them is low. In particular, it often happens that a contractionary policy that starts by raising the controlled prices of public enterprises and subsidized goods, and by devaluing, will both raise the inflation rate and reduce the deficit. In the United States, as in Italy, the high deficits of this decade have been accompanied by a decline in inflation.

Nonetheless, budget deficits do sooner or later tend to create inflation, and countries with very high budget deficits are very likely to find themselves at some point confronted with extremely high rates of

inflation. There have been massive budget deficits in all the great hyperinflations, with the inflationary process and the deficit feeding on each other through the Tanzi effect as higher inflation reduces tax revenue, and through declines in seignorage revenue as higher inflation causes a flight from money.

The correlation between the deficit and inflation is low in the early stages of inflations in part for the reason explained above, that programs to reduce deficits are often inflationary. It is low also because the economy adjusts slowly to inflationary pressures. And the correlation may be low for a third reason, because the public in an economy with a high deficit may at different times have different expectations about how the deficit will eventually be closed. For instance, if the public believes at one point that the government will attempt to deal with its fiscal problem through an inflation that erodes the value of the public debt, current inflation--reflecting the expectation of future inflation--will rise. If, at a later time, the public believes that nothing short of a major fiscal package reducing the deficit is possible, the expected inflation rate may be reduced and current inflation--again reflecting the expectation of future inflation--may fall<sup>12</sup>.

Milton Friedman's famous statement that inflation is always and everywhere a monetary phenomenon is correct. However governments do not print money at a rapid rate out of a clear blue sky. They generally print money in order to cover their budget deficits. Rapid money growth is conceivable without an underlying fiscal imbalance. But it is unlikely. Thus rapid inflation is almost always a fiscal phenomenon.

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<sup>12</sup>This argument is developed by Drazen and Helpman (1986).

## V. Concluding Comments.

The macroeconomic analysis that we have outlined is a useful starting point for examining the economics of budget deficits. But it takes more than a single indicator to judge fiscal policy. The microeconomics of fiscal deficits is both crucial in its own right and has an impact on the macroeconomics of deficits. The more efficient are taxes and spending, the higher is the public deficit that can be sustained, since growth will be higher.

Consideration of the macroeconomics of the government budget constraint points to the dangers that arise from excessive budget deficits: inflation, exchange crises, external debt crises, and high real interest rates, with implications for the real exchange rate and the trade account, and for investment. None of the links are automatic, for there are choices in the sources of financing, and lags in the effects of money printing and borrowing on inflation and interest rates.

Nor are moderate budget deficits to be avoided at all costs; small deficits can be financed without creating excessive inflation, exchange crises, or building up debt excessively. If the real interest rate exceeds the growth rate of GNP, any primary deficit smaller than the maximum amount of seignorage revenue the government can obtain is sustainable. Whether any particular path of fiscal policy is sustainable has to be checked through projections of the debt to GNP ratio; a given deficit is more likely to be sustainable the higher the growth rate of output.

Of course, the fact that a fiscal policy is sustainable does not mean that it is optimal. A fiscal deficit crowds out private investment, and it might well be desirable to reduce the debt-to-GNP ratio in order to crowd in private investment. Similarly it is not optimal to collect the maximum possible amount of revenue from seignorage, but rather a smaller amount corresponding to a lower inflation rate.

Both theory and evidence tell us--and warn us--that large budget deficits pose very real threats to macroeconomic stability, and therefore to economic growth and development.

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Appendix 1: Problems of Measurement.

International comparisons of fiscal data are plagued by the great variation of methodology and the lack of comprehensive coverage of the public sector. Deficit definitions change from country to country or even over time in the same country. One country may include aid receipts as revenue, while another treats it as deficit finance. Some countries have data only on the national government, while others cover to varying degrees local governments, state enterprises, and decentralized agencies. In some countries, activities of the central bank or other public financial intermediaries create significant losses, but including their deficits in the overall public sector is difficult because of conceptual problems and lack of reliable data. Social security is consolidated with the public accounts in some countries, but not in others. Many examples can be given of such accounting difficulties.<sup>13</sup>

Even aside from technical accounting problems, there are broader issues of how to define deficit in an economically meaningful way. Many alternative definitions have been proposed to attempt to remove short-term distortions from deficit measures<sup>14</sup>. The most important single correction is to adjust the deficit for the inflation component of interest payments, yielding the inflation-corrected or operational deficit. The correction removes from the deficit the product (inflation rate x stock of debt), thereby including in the operational deficit only the real component of

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<sup>13</sup>The most comprehensive collection of fiscal data is in the IMF's Government Financial Statistics. World Development Report 1988, p45 describes data sources..

<sup>14</sup>A discussion of alternative measures of the deficit is presented in World Development Report 1988, pp56-57.

interest. The correction can be substantial. For instance, estimates of the fiscal deficit in Mexico for 1987 imply a deficit of over 15% of GDP, but the operational balance shows a surplus of 3%.

Some economists disagree with the use of the operational deficit on the grounds that the government has in fact to find a way of meeting the interest payments, even if they only reflect compensation for inflation. A useful way of thinking of the operational deficit is that it provides an approximate measure of the size of the deficit the government would have to deal with if it succeeded in getting rid of inflation. Thus the fact that there was an operational surplus in Mexico in 1987 meant that there was no underlying fiscal problem that was inconsistent with the government attaining a zero or low inflation equilibrium.

In addition to correcting the deficit for inflation, influences from commodity price fluctuations or domestic output above or below trend are sometimes removed to give the structural deficit.

Deficits can also be underestimated because of controls on interest rates or key prices. For example, negative real interest rates paid on government debt will make the deficit appear lower than if the interest bill were evaluated at the true opportunity cost of capital. An artificially low exchange rate applied to government external debt in a system of multiple exchange rates would similarly suppress the size of the true deficit. To correct for such distortions, public deficits can be evaluated at the long-run equilibrium values of the interest rate, exchange rate, and other key relative prices.

Appendix 2: Bibliographical Note.

Several literature references have been provided in the text. I present here a small sampling of some additional sources relevant to the themes discussed in the lecture. A good summary of the macroeconomics of the financing of government deficits is provided in Buitert (1988) and Van Wijnbergen (1989), with earlier treatments by Tanzi (1984, 1985) also very useful. Empirical analysis of deficit financing is provided in Easterly (1989).

Treatment of the problem of high inflation is contained in Blejer and Liviatan (1987) and Kiguel and Liviatan (1988). Ize and Ortiz (1987) discuss the relationship between fiscal deficits and capital flight. A discussion of the link between the external debt crisis and fiscal behavior is contained in many of the papers in Sachs (1989).

The relationship between debt and growth is discussed in many of the papers in Corbo et al (1987). Van Wijnbergen (1988) and Buitert (1985) contain clear presentations of the debt dynamics identity.

The role of public investment in commodity-exporting countries is trenchantly analyzed in Gelb (1988). The Tanzi effect is presented in Tanzi (1977). A good treatment of the role of expectations in macroeconomic policy can be found in Drazen and Helpman (1986).

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