

Investment, Growth, and Budget Deficit Ceilings.

A Review of the Issues.

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1. Introduction

Fiscal targets and indicators play an important role in the design and execution of fiscal policies by the governments of many countries. They are also a key ingredient in the formulation and the implementation of programs under arrangements between the International Monetary Fund and its member countries. These arrangements, in turn, frequently influence decisions about development assistance by other international economic organizations (such as the World Bank and the European Community) and by donor countries. Fiscal targets and indicators also play an important role in the process of monitoring the fiscal situation among members of regional economic and monetary groups like the European Community (EC) and the West African Economic and Monetary Union (WEAMU).

Yet, the search for a generally accepted concept of the “fiscal position” has remained elusive. The traditional concepts of *overall fiscal deficit* or *overall fiscal balance* have been criticized in various respects: they reflect the endogenous effects of cyclical changes in the economy on taxes and transfers; they are distorted by inflation; and it fails to reflect fiscal policy efforts by including interest payments on the debt. The response to these criticisms has included the construction of alternative measures of the fiscal position, such as the *cyclically adjusted balance*, the *primary balance*, the *operational balance* and the *structural balance*. These adjusted measures have helped to provide a better picture of the underlying fiscal position in

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certain circumstances (e.g., recessions, periods of hyper-inflation) or for certain purposes (isolating the effects of fiscal policies from those of cyclical developments). However, they have not helped to cope with two central problems: the inter-temporal (and intergenerational) dimensions of most fiscal problems; and the proper treatment of public investment. These are some of the principal issues discussed in this paper against the background of two seemingly contradictory developments: the tendency of some economists to downplay the role of capital formation as an engine of growth; and the view that the recent decline in infrastructure investment in the OECD area and in Latin America has contributed to slower growth. .

This paper is organized as follows. Section 2 focuses on the relation between capital formation and the level as well as its rate of growth of per capita output. It also examines recent controversies about the relative importance of investment and total factor productivity as determinants of a country's per capita income. Section 3 deals with the rationale for fiscal targets, and especially with the issues of crowding out and solvency. The following three sections deal with specific fiscal targets, their interpretation, policy implications, merits and shortcomings, including in particular the extent to which they may discourage private investment. Section 4 deals with the traditional concept of *overall deficit*; section 5 focuses the alternative of targeting the *current balance* (or *government saving*), which excludes public capital formation from the items subject to the ceiling. Section 6 examines the system of *generational accounts*, conceptually the most adequate and comprehensive indicator of fiscal policy and its effects, but also one that is most demanding in terms of the statistical information required to set it up. Section 7 concludes.

2. Capital Formation, Per Capita Output and the Rate of Growth of the Economy.

The recent preoccupation about the adverse effects of deficit targets on public investment (especially infrastructure) has been motivated by the view that a shortfall in public investment particularly in infrastructure, would result in slower growth.² Indeed, modern economic

² This concern was expressed by the governments of Brazil and Argentina who asked the I.M.F. to analyze the issue in detail and come up with recommendations. See International Monetary Fund (2004).

growth theories (including the Harrod-Domar, neoclassical, and endogenous growth theories), as well as the empirical evidence suggest that there is an important link between capital formation and output per head, and between capital formation and economic growth. These theories differ, however, as to the size and the duration of the effect on growth.

(i) Investment raises the level of potential GDP. Does it also raise its growth rate?

There are important differences between models as to whether an increase in the saving and investment rates leads to a permanent rise in the rate *growth* of per capita GDP, or only to a permanent increase in the *level* of per capita output.

- In the *Harrod-Domar model* output is directly related to the capital stock so that a rise in the saving rate (stemming for example from a reduction in government expenditure or a tax increase) leads to a *permanent* rise in the growth of potential GDP.³ Owing to its apparent simplicity, the Harrod-Domar model has been extensively used by economists in national governments and international organization like the World Bank and the IMF. But it has been heavily criticized for being analytically flawed and empirically useless, most ferociously in William Easterly's book *The Elusive Quest for Growth (2001)*.
- In the neo-classical *Solow-Swan model*, GDP is a function of the capital stock, the labor input, and total factor productivity (TFP)—a function that involves diminishing returns to capital and labor.⁴ Capital includes physical capital and, in several models, human capital. TFP includes the technological, organizational, demographic, cultural and political factors that determine how well capital and labor interact to produce output. In this model, a rise in investment leads to a *temporary* rise in growth, as the

³ The Harrod-Domar model also involves a linear relation between output and the labor input, in addition to the already noted linear relation between output and the capital stock. It is the interplay between these two relations which results in a kinky (Leontieff-type) production function. This, in turn, has given rise to the possibility of two equilibria: one is unstable and sits on a razor's edge beyond which the economy implodes and unemployment rises indefinitely; the other is a stable equilibrium with permanent unemployment of capital

⁴ Unlike Harrod-Domar, the underlying neo-classical production function used by Solow and Swan is smooth and avoids the kink that characterizes the Leontieff production function. As a result, the Solow-Swan model has a single steady state equilibrium at which the growth of per capita GDP is constant except for any (exogenous) change in total factor productivity.

economy converges to its new steady state equilibrium. Once the steady state is reached, however, the growth of endogenous output per head ceases and the economy stabilizes at a higher *level of per-capita output*. In other words, the rise in the saving rate (and therefore in the investment rate) leads to a lasting increase in the steady-state levels of both per capita output and the capital-labor ratio; but *only a temporary increase in the growth* of these variables. At the steady state, continued growth in per capita GDP can only result from an increase in TFP. This result has been considered unsatisfactory by many theorists because it meant that long term growth was determined exogenously and by a construct (TFP) that represented the “measure of our ignorance”. This has motivated the development of endogenous growth theories. At the same time, there has been a considerable body of econometric literature on both advanced and developing countries that finds a significant link between output and a number of variables associated with TFP: (a) a large set of political, institutional, demographic and economic policy variables;⁵ and (b) factors that affect technology (such as investment in R&D and higher education). Total factor productivity is no longer “the measure of our ignorance”.

- *Romer’s endogenous growth model (known as the AK model)* starts with a relation between output and the capital stock, like the Harro-Domar model. But Romer’s model does not include a separate relation between output and the labor force, and therefore avoids some of the flaws of the Harrod-Domar model. In the Romer model a rise in investment will increase growth *permanently*, as in the Harrod-Domar model, but without the elements of instability that severely hinders the usefulness of the latter. Other endogenous growth models (based, *inter alia*, on a combination of human and physical capital, on externalities, or on the endogenous determination of technological growth, lead to similar conclusions. Economists remain divided between neo-classical and endogenous growth schools, on whether a rise in the investment rate increases the

⁵ For one of many examples, see Easterly and Levine (2001, table 7, page 210). The set of explanatory variables considered by the authors include: average years of schooling, openness to trade, inflation, the size of government and the premium on foreign currency in the black market (a frequently used proxy for the intensity of distortions). Others have considered the level of financial development, indicators of institutional quality and corruption, and the incidence of armed conflicts, among the variables that help to explain TFP.

rate of growth of the economy or just the level of per-capita output. At the empirical level, however, the Solow-Swan model has received considerable support from econometric work on the determinants of TFP. By contrast, not much empirical evidence has come up to support endogenous growth theories which, in the words of Pack (1994) remain a combination of “Intellectual Appeal and Empirical Shortcomings”.

2. Downplaying the contribution of capital formation and emphasizing the role of total factor productivity

Recently, William Easterly and Ross Levine (2001) have de-emphasized the role of capital formation in explaining economic growth. The authors important findings, however, do not quite justify the strong conclusion stamped in the title of their article: “*It’s not capital formation, it is TFP*”. A more justifiable conclusion would be that, TFP may well play a more important role than previously believed in accounting for growth, particularly in the developing countries. Still, Easterly and Levine (2001) and Easterly (2001) bring up a number of disturbing facts. The recent economic history of many of these countries displays large swings in growth over time that cannot be explained by the evolution of capital formation, which remains a historically stable source of growth.⁶ Ross and Levine illustrate the dramatic variability of per capita income over time in countries like Cote d’Ivoire, Jamaica, Nigeria, and Guyana (Figure 4, page 197), and similar developments have been reported in Cameroon (Ghura, `997). While terms of trade developments, account for a part of these gyrations, there is little doubt that changes in policies and in the quality of governance have been an important contributing factor. Easterly and Levine also report very large inter-country differences in per capita income that cannot be credibly explained by differences in capital stocks.

Finally, the literature on growth accounting, reviewed by Easterly and Levine, reveals that the percentage contribution to GDP growth of the rise in TFP has been larger than the

⁶ The so called *Lucas’ paradox*—which claims that, in the context of the Solow model, the 15 fold difference between the output of a U.S. worker and that of an Indian worker must reflect the fact that American workers operate with 15 times more machines than Indian workers, is easy to resolve. The answer is that TFP in the U.S is many times higher than in India.

contribution of investment in most OECD countries in the period 1947-73,⁷ but this tendency appears to have been reversed in the period 1960-90. In Latin America (1960-90) the contribution of capital formation appears to have been larger than that of TFP, except in Chile. In East Asia the contribution of investment has been larger, but the contributions of labor force and TFP growth also have been substantial except in Singapore where it was slightly negative. Other studies also show negative growth of TFP in several African countries. Easterly and Levine's own analysis of the inter-country variance of growth rates attributes a higher contribution to TFP growth than to capital formation—with the difference in favor of TFP increasing over time. Nevertheless the contributions of capital formation remain appreciable.

In conclusion, there is a growing consensus among development analysts that the factors accounting for the growth (or decline) in TFP are now better known, that the influence of TFP is very large, particularly in the developing countries, and that policy makers and analysts should pay much more attention to the components of this variable. However, inasmuch as the contribution of capital is significant, even if not predominant, any factors that hinder investment should remain the subject of serious attention. This applies to fiscal targets that constrain public investment. Perhaps more importantly, it applies to factors that inhibit private capital formation, such as overly high marginal tax rates, unjustified tax preferences, the *risk* of economic and political stability, including in some regions the risk of armed conflict, and the failure of the judicial system to uphold property rights and enforce contracts

3. The Rationale for Deficit Targets

Fiscal restraint is a broadly accepted objective of policy, and deficit ceilings are the most common tool for implementing restraint. Among the reasons for fiscal prudence is the concern that deficits would crowd out private investment and net exports, and that it would increase the government debt or to a level were inflationary financing, arrears and ultimately default would become a serious preoccupation.

- **Crowding out of private expenditure by domestic borrowing.** *Inasmuch as the deficit is financed by issuing domestic interest-bearing liabilities, there is a danger*

⁷ Table 1, page 183.

that private investment will be crowded out In Keynesian macro models (e.g. IS-LM) this crowding out effect occurs through a rise in the real interest rate, and is subject to a criticism similar to the one directed at Keynesian models in general: it is the *stock of capital* and *not the rate of investment* (a flow) that is inversely related to the interest rate. The investment-saving balance thus cannot determine the interest rate beyond the very short run.⁸ It can also be argued that the deficit will crowd out net exports of goods and services through a real appreciation of the exchange rate, weakening the current account of the balance of payments and increasing the external debt. (This argument, however, is subject to a similar criticism in terms stock-flow confusion). A ceiling on the deficit would prevent a rise in the government debt that is viewed as “excessive”, thus forcing the government to raise taxes or reduce public expenditure, including public investment, to remain under the ceiling, and thus protect the capital stock

- **Crowding out of private expenditure by borrowing from abroad.** Adverse effects on private expenditure (investment or net exports) can also occur if an “excessive” deficit is financed by issuing liabilities to foreigners, through a rise in real interest rates and/or an appreciation of the real exchange rate. In the latter case the market could perceive the risk of future debt-servicing difficulties, pushing up the country’s risk premium and its country-specific borrowing interest rate in world markets. This might even lead to rationing or outright denial of external loans to the country by foreign lenders.
- **Financing the deficit by borrowing means postponing a tax increase, and thus shifting the burden of new taxes to today's young and to unborn generations.** with the increasing preoccupation in advanced countries with the fiscal consequences of ageing populations. with the increasing preoccupation in advanced countries with the fiscal consequences of ageing populations. Attention to this issue has extended from the theoretical field of intergenerational relations to the practical, policy-oriented world of fiscal analysis.

⁸ There another theoretical objection to the concept of “crowding out”, which stems from “Ricardian equivalence” principle. In this case, the private sector increases its saving to compensate for the decline in government saving resulting from a bond-financed deficit. There is not enough empirical evidence to validate these propositions in full, although there is some evidence of a *partial* Ricardian effect in various countries.

- **Disruption and crowding out by deficits financed through arrears.** In effect, *“financing” the deficit by accumulating domestic payments arrears* amounts to the imposition by the government of an illegal and unexpected tax on its local creditors. It will lead to a sudden drop in the profitability of domestic corporations and financial institutions, damage relations between the business sector and the government, or even to a crisis of confidence and a paralysis of private activity. Even if the accumulation is limited to domestic arrears, the damage done to the profitability of domestic enterprises (including foreign affiliates) could be substantial, as illustrated by several examples in Africa, and the country’s credibility could be seriously damaged. Accumulating external arrears will have similar effects. Although the disruptions suffered by large international lenders may be relatively less severe, the adverse effects on the borrowing country may be serious: credibility and access to foreign loans may be curtailed, and the country risk premium could widen, raising the country’s cost of borrowing in world financial markets. At the technical level, this concern explains and justifies, the IMF staff’s practice of including in its programs a zero-ceiling on external arrears, in addition to other, more general budgetary targets. A ceiling on domestic arrears would be equally justified, but more difficult to enforce.
- **Financing the deficit through monetary expansion** amounts to imposing an inflation tax that erodes the real value of private claims on the government. The negative effects on economic activity and social peace of continued (even if eventually unsuccessful) attempts to impose the inflation tax will involve a rise in uncertainty and, in particular, real interest rates and real exchange rates instability. In extreme cases these effects can be devastating, as illustrated in the case of Congo/Zaire by Beaugrand (2004).

It may be noted that the concerns expressed above are strongly interrelated and, to some extent, may be facets of the same concern. What is wrong, after all, with the “crowding out” of domestic investment by government borrowing? What is wrong is that insufficient capital formation may lead over time to an undesirably low capital stock and thus an undesirably low level of potential output. This is good for today’s adults, who have managed to consume more (and invest less) than would have been the case without the “excessive” government

borrowing. But it is bad for today's young and for members of *future* generations, who will have pay more taxes (and thus cutback on consumption) to pay for today's party. Clearly, the concern about crowding out is closely related to the concept of *intergenerational equity*. Confronted with a burden that they deem unfair, future generations may refuse to pay more taxes—or to accept cuts in transfer payments that they view as entitlements—and they may chose to tax domestic and foreign creditors by declaring default. Thus the related issues of crowding out and excessive tax burdens on future generations are closely related to the concern about solvency and economic and political instability.⁹

So far this section has dealt with the adverse effects of public expenditure, including public investment, on *private* capital formation. If the rates of return on private and public capital were the same, the net effects of a rise in government investment on output would be positive. But there is some evidence that the return on private investment exceeds the return on government investment (Ghura 1997). In that case, and on the reasonable assumption that crowding out is less than 100 percent, the net effect could be negative. There are other effects however. (a) there could be a **complementary** relation between private and public investment (particularly in infrastructure) in which case the rise in public investment would crowd *in* private investment. Whether or not this would offset crowding out of the traditional style is an empirical question. (b) Unlike government consumption, “good” government investment increases not only actual output (through aggregate demand and multiplier effects) but also potential output, thus avoiding full crowding out even when the economy is operating at high employment. As noted by Calderón, Easterly and Servén (2002) a rise in the level of potential GDP also improves the economy's debt servicing capacity, so that the most heavily indebted countries are those that benefit the most from increased capital formation.

There is a considerable body of econometric work on the effects of public investment on the economy, but the results are mixed. Within the large number of studies examined by the IMF staff (2004, Appendix I) most, but not all, suggest a positive correlation between public capital formation and per capita output or productivity. But many of the relevant estimates are

⁹ This may sounds like a concern for the very long run, unworthy of the attention of a government facing immediate fiscal pressures. It is not. Future generations of tax-payers include some individuals that are already born and whose leaders might soon face the hard choice of raising taxes or defaulting. Moreover, speculative pressures against the government in financial markets will not await the actual occurrence of a solvency crisis. Pressures could begin, and then intensify rapidly, as soon as the prospect for debt servicing difficulties becomes apparent.

statistically insignificant and/or lack robustness with respect to the methodology used or to the explanatory variables included. The results are also mixed in the case of studies that concentrate on investment in infrastructure. Among the most interesting contributions in this area is that of Calderón and Servén (2002) who seek to estimate the impact on real GDP per worker of three infrastructure variables transportation (roads and rail), electricity generation, and telecommunications, for a group of 18 Latin American countries¹⁰. Using an “infrastructure augmented” production function, the authors find a statistically significant effect of each of the three infrastructure variables on output per worker, with a particularly strong effect from the telecommunications variable.

4. The Traditional Concepts: Overall Fiscal Deficit and Gross Government Debt.

The traditional concept of overall fiscal deficit is defined as the difference between government revenue and government expenditure (including both government consumption and investment). The accumulated value of the deficit is the gross national debt.

The fundamental concern underlying the overall balance concept is that, unless the deficit is limited, *the private capital stock would be crowded out, government debt would accumulate to a point where it will become unsustainable and ultimately hurt the economy by causing inflation, payments arrears or even default.*¹¹ This concern is legitimate. Whether it can be addressed by using the conventional overall fiscal deficit to specify targets and guide policy evaluation is far less certain. The conceptual difficulties associated with the underlying neo-keynesian (IS-LM) model have already been noted. But there are other fundamental problems.

¹⁰ The authors use cross-section as well as pooled cross-section time-series regressions and a variety of estimation methods.

¹¹ To facilitate comparisons with other fiscal concepts, we can define the overall fiscal deficit as $D = G + Ig - T$, where D is the overall deficit, G is government consumption, Ig is government investment and T is tax revenue. Transfers can be included as part of G , as is customary in the traditional fiscal accounts, or netted out of T , as in the literature on generational accounts (see Auerbach and Kotlikoff, 1991). In the traditional approach, the deficit is equal to the increase in government debt ($D = \Delta B$). Therefore the previous equation can be reformulated in terms of *stocks*: $\sum (G-T)_{t-i} + Kg = B$, with the summation running from minus infinity to zero. Thus a ceiling on the overall deficit amounts to a constraint on the current balance plus the government's capital stock.

i. **Lack of an intertemporal dimension.**

The customary overall deficit concept, and its primary, operational, and structural offshoots, are measured on a yearly basis and take no account developments in future years, even if these developments can be anticipated with a high degree of probability. This can lead to absurd results, as when the government imposes a tax of \$100 million in year 1, but offsets this in year 2 by transferring \$100 million plus interest to the tax payers. The deficit associated with these transactions is \$100 million in year, showing no sign that the fiscal position will shift to a surplus of \$100 million in year 2, thus leaving the average tax-payer in exactly the same position as he was before the imposition of the tax in year 1. In this simple case, a 2-year fiscal projection will provide a much clearer picture..

Suppose now that the government, borrows \$500 million by issuing Treasury securities in year 1, and at the same time transfers \$400 million to the citizenry. In year 2 the government repays \$500 million in principal and increases taxes by \$400 million, with interest added to both transactions. The annual deficits, \$400 million in year 1 and minus \$400 million in year 2. are very different from those registered in the previous example, yet in both examples the position of individuals has remained essentially unchanged.

Auerbach, Gokhale, and Kotlikoff (1994), from which these examples are taken, conclude that "...it is *impossible* to measure the debt and the change in the debt—the deficit—in a way which carries a useful underlying economic meaning." The deficit numbers may hint at the fact that some intergenerational transfers may be taking place, but they tell us little about whether they will continue, stop, or be reversed. Clearly, the deficit ignores the future in a way that can provide seriously misleading signals about the underlying fiscal position and the consequences of borrowing. Without longer-term economic and fiscal projections, the policy-maker will go through history like a blind man, ignoring the implications of likely future developments as well as the inter-generational consequences of its own policies. As emphasized by Heller 2003, the authorities will also ignore the likely impact of other major future developments that are to some extent foreseeable. These include the ageing of populations, the discovery of natural resources, climatic changes¹² and natural disasters such

¹² Some of these effects are subject to controversy like global warming, others are likely to occur although the timing may be uncertain, like desertification in Saharan Africa and catastrophic flooding in Bangladesh.

as earthquakes and floods that are, to a limited extent, foreseeable; and the need to protect the population and national wealth against the actions of domestic or foreign predators.¹³ Even imprecise estimates of the probability of these events would allow governments to make provisions for “bad days”, avoid being taken by surprise, and lowering the human and economic costs of disasters. Unfortunately, this idea has not always been popular among developing countries.

ii. The treatment of public investment.

It has been argued for some time that the inclusion of public capital expenditure, among the items subject to the overall ceiling is unjustified. In the words of Heller (2003), “If investments are well chosen, there is little economic reason not to use debt to finance them. Not only would net worth be unaffected, but it would also be reasonable to spread the costs of that financing across different generations of beneficiaries.” Section 4, below, analyzes this statement in some detail particularly with regard to the meaning of “well chosen” investment. Recently, the governments of Brazil and Argentina have stressed that capital formation by the government is an important element of a growth-oriented program, and asked the Fund to reconsider the practice of including public investment on infrastructure under the ceilings specified in Fund programs. The IMF (2004) responded with a comprehensive paper analyzing the problem, as well as certain related issues like coverage. It concluded that, “while maintaining focus on the overall balance and the public debt as a basis for fiscal analysis and policy (and fiscal conditionality in Fund-supported programs), steps are taken to promote productive public investment.” The conclusion is vague. But given the theoretical strength and the empirical weakness of the case for removing public investment from program ceilings, it may point to a workable solution to the problem.

5. Targeting the government’s current balance and government net wealth.

Removing public capital formation from under the target ceiling would be equivalent to targeting the government’s current balance, i.e., the difference between government

¹³ Which has become dramatically evident in several African countries like Sierra Leone and Uganda.

consumption, and government revenue.¹⁴ The current balance is equal to the flow-of-funds concept of government saving, with sign reversed.

(i) Conceptual issues.

Shifting the ceiling from the overall deficit would leave capital formation free to move up during the program period. It also amounts to *targeting the change in government net wealth*, which seems to be the right thing to do from the perspective of *solvency*¹⁵. A country's net worth is the true measure of its bequest to the future generations. In other words, asset accumulation by the government¹⁶ (including capital formation, is netted out from gross government borrowing, providing a true picture of the change in the country's *net indebtedness*, which is what matters to evaluate solvency. In principle, asset accumulation should be broadly defined to include physical as well as financial assets, including claims on foreigners held by the central bank.

The rationale for targeting the current balance rather than the overall deficit is often expressed as a way to “protect pro-growth investment”, a statement that must be clarified in various ways.¹⁷ Assuming for the time being that the new investment—i.e., the investment that is made possible by shifting from an overall deficit to a current balance target—is “productive”, this will lead to an expansion of potential output. Whether or not this will lead to a *permanent* rise in the *rate of growth* of potential output depends on the particular model used, as indicated above in section 2. Under the Solow model the answer would be negative. What is uncontroversial is that an increase in the investment/GDP ratio will raise the *level* of potential output per capita and thus the future standard of living of the population. This can be seen clearly by comparing the effects of a rise in investment under the alternative assumptions of tax financing and bond financing.

¹⁴ As indicated in the previous section, the overall deficit is equal to $D = \Delta B = G + Ig - T$, and imposing a ceiling on $D = \Delta B$ amounts to constraining the difference between government expenditure (consumption plus investment) and taxes. Freeing government investment from the ceiling amounts to shifting to a current balance (or government saving) target. Subtracting Ig from both sides of the previous equation results in: $\Delta B - \Delta Kg = G - T = C$, where $\Delta Kg = Ig$ is capital formation by the government, C is the current balance, and $\Delta B - \Delta Kg$, the difference between gross borrowing and gross asset accumulation by the government, is the change in government net borrowing, or government net worth (ΔW) with a negative sign. Therefore, targeting the current balance amounts to targeting the change in government net wealth. $T - G = \Delta W$.

¹⁵ An approach based on targeting government net worth can be found in Buiters (2003).

¹⁶ Defined as physical capital formation plus changes in net financial claims on foreigners (including holdings of equities, bonds, Treasury bills, and other foreign securities).

¹⁷ See, for example, Heller (2003), and IMF (2004).

- The government can finance a higher level of public investment by **taxing existing generations**, thus raising the national saving rate and allowing future generations to enjoy a higher level of income. This will be *permissible* under both an overall deficit and a current account target, but it will not necessarily be *desirable*. It will be *desirable* if current fiscal policy already penalizes future generations, as is most probably the case in the United States and in many advanced countries where the population is aging rapidly. It may be *undesirable* in a country like Singapore where the saving and investment rates are already extremely high, or in a country where distortions or the false expectations generated by “implicit” government guarantees have led to over-investment. It may also be undesirable in a country where total factor productivity growth is expected to be sustained at a very high level, so that the standard of living of future generations would improve even without intergenerational transfers. In these circumstances, it might be argued that raising investment is not a high priority and that, if higher growth is nevertheless desirable, policy should focus on increasing TFP. In the particular case of Singapore, and in contrast with other East Asian countries, TFP has played little or no role in accounting for the country’s very rapid growth rate.

In sum, raising taxes to finance higher investment involves a transfer of consumption from the existing generations to the future generations, whether the country is subject to an overall deficit target or a current balance target. Fiscal policy in this case influences the *level* of potential output by shifting per capita consumption across generations. It is a zero-sum game; positive sum games will have to involve a rise in total factor productivity.

- Alternatively, **the new investment can be financed by borrowing**, which is permissible under a current balance target but *not* under an overall deficit target. In this case, future generations will see their income rise with the increase in productive capacity generated by the new public investment, but it will have to raise the resources needed to service the new debt—which should not be a problem *if* the rate of return on the investment exceeds the borrowing cost. In sum, the shift from an overall deficit to a current balance target will make it possible to finance new investment which will (i)

leave consumption by the existing generations unchanged and (ii) increase per capita income, and therefore consumption possibilities, for future generations. Keeping in mind that these targets are *ceilings*, the shift will in no way *oblige* the government to invest *more*. If the saving rate is already too high, if TFP growth is expected to be very strong, or if there is evidence of excessive capacity building, the country could refrain from investing more than it would have under an overall deficit target.

In conclusion, **at the analytical level, there is a strong case for moving from an overall government deficit (or government debt) target to a current account balance (or government net worth) target.**

(ii) Problems of implementation.

Is the case for targeting government saving equally strong at the practical level?

The most serious problem is to ensure that the investments allowed under the new targets are “good”, “well chosen”¹⁸ investments. Put somewhat more rigorously, net investment must yield a rate of return that exceeds the cost of borrowing. This may be difficult to achieve because of corruption and/or inefficiency.

- **Domestic or external funds originally appropriated for government investment can be deviated into consumption by corrupt officials** and their private sector accomplices. The additional “investment” made possible by the shift to a ceiling on government saving will be effectively channeled into consumption. Saving and investment rates will not rise, and the alleged rise in “investment” will not translate into higher levels of potential output and future living standards. The diversion of funds may not be reflected in changes in official government consumption statistics, as corrupt officials may succeed in concealing these changes, in which case, official estimates of investment will be biased upward.
- **Inefficiency** can also reduce the rate of return on net investment, and poor tax administration and lack of political control may complicate the government’s capacity to raise fees and public utility tariffs—a perennial problem in the electricity sector, both in Africa and in Latin-America. The IMF staff (2004) has

¹⁸ Another member of this family of vague albeit widely used concepts is “pro growth investment”. That may not apply to any reality, however, not because of the shortcomings of fiscal targets, but because per-capita output converges to a steady state were growth can only result from exogenous TFP growth.

noted that the shift from an overall to a current account target could induce “creative accounting” aimed at reclassifying consumption to investment in the public accounts to gain space under the budget ceilings.

- **Liquidity considerations.** In case of confidence crisis, speculators may be reassured by the government’s liquid assets, e.g. central bank holdings of short-term foreign securities and deposits. But many types of government assets are *illiquid*: roads, bridges, and infrastructure in general. They cannot be sold easily and quickly in times of crisis, and hence does not inspire full confidence in the country’s ability to repay its debt on a *timely* basis.¹⁹ Government assets could be broken down by degree of liquidity, for example by excluding liquid international reserve assets from the ceiling. A further breakdown of assets is possible but could be technically difficult and potentially conflictive. Furthermore the interest of developing countries in “protecting” government investment applies mostly to infrastructure, not to financial asset accumulation.

There are also several caveats and problems to be kept in mind when using government saving or the current account balance as targets.

- The **coverage of debt and deficits should be comprehensive**, i.e., the debt should cover the central government as well as the local governments. Discussions about the fiscal position in the United States often usually focus on the deficit (debt) of the *federal* government and its agencies, ignoring the combined surplus (assets) of the state and local governments. This appears to be unjustified, even though the fiscal positions of the states, counties and municipalities are often subject to statutory limitations. The U.S. method thus amounts to erring on the side of budgetary restraint.
- The **coverage of government assets should also be comprehensive**: it should include the stock of physical capital, land, mineral rights and net claims on foreigners by the government.
- In some budgets the **distinction between government current expenditure and capital expenditure is not systematic**. For example the United States classifies

¹⁹ It could be argued, however, that physical assets can be pledged (oil reserves) or sold in whole or in part. More generally, market participants’ evaluation of the government’s capacity to service its debt will probably increase as the government becomes richer.

most of its acquisition of assets for defense purposes as current expenditure rather than investment.

- Targeting government saving may result in discrimination in favor of *physical* capital formation and against *human* capital formation.

(iii) Is an increase of government investment ever justified in periods of adjustment?

Is government spending “pro-growth” or “anti-growth”? It depends on the time frame and on the cyclical position of the economy. If the economy is in recession and capacity output is well above actual output (the Keynesian world) an increase in government spending may increase actual output by increasing capacity utilization. If the economy is at full employment, (the neo-classical world) there is no scope for increasing output by using capital and labor more intensely. The only way to increase production is to raise potential output. In those circumstances, an increase in government current expenditure will lower saving and thus unambiguously and permanently reduce potential output. An increase in government capital expenditure would also absorb saving (domestic or foreign), but at the same time it will increase the capital stock and therefore potential output. How large will the net effect be will depend on how “good” the investment is. In the case of externally financed investment projects, it will depend on the difference between the risk-adjusted rate of return on domestic capital and the international interest rate. If the difference is expected to be positive, productive capacity and future income will increase. But the margin of risk may also widen and this could erode market confidence in a period of crisis, particularly if corruption and inefficiency are a serious concern. The point is that any serious doubt about the profitability of new investments may raise the perceived risk of additional net debt accumulation and aggravate the confidence crisis. Of course, examination and approval of the new investment projects by the World Bank (or regional financial institutions like the IDB) would be reassuring.

7. Generational Accounting

The growing importance given to intergenerational transfers and long-run considerations in the discussion of fiscal issues has led to explicit consideration of the government's intertemporal budget constraints, in the context of models based on government balance sheets. Auerbach, Gokhale and Kotlikoff (1992 and 1994, hereafter AGK) have provided a framework based on the most comprehensive and rigorous approach to these ideas. They also have shown that this framework can provide a useful tool for quantification and for long-range simulation of policy effects. In the words of Kotlikoff and his associates, *“Generational accounting indicates, in present value, what the typical member of each generation can expect to pay, now and in the future in net taxes (taxes paid minus transfers received).”* They indicate what both existing and future generations will have to pay under current (or expected) fiscal policy. And they specify an inter-temporal budget constraint under which *“those government bills not paid by current generation will ultimately have to be paid by future generations.”* In its simplest form the budget constraint can be expressed by the following equation:

P.V. of net tax payments of existing and future generations	=	P.V. of future government consumption	–	Government net wealth
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where net tax payments are defined as gross tax payments minus government transfers. By separating the net tax payments of existing (already born) and future (unborn) generations, the equation can be rewritten in a way that highlights the intergenerational transfers involved and allows comparison with other types of budget constraints.

P.V. of remaining net tax payments of existing generations	+	P.V. of net tax payments of future generations	–	P.V of future government consumption	=	government net wealth
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This equation resembles the definition of the budget constraint under the current account or government saving approach, which states that the difference between taxes and government current expenditure is equal to the change in government net worth (gross borrowing plus

asset accumulation by the government).²⁰ Under both approaches, government investment would not be subject to a ceiling. There are major differences however²¹. First, the Auerbach-Kotlikoff approach is intertemporal (taxes, transfers and government consumption are in present value terms), and it provides a view of current as well as projected net taxes and consumption. Second, it is consistent with the intertemporal constraints under which fiscal policy must operate: failure to satisfy these constraints will lead to default on the government debt.

Auerbach and his associates, in cooperation with the U.S. Office of Management and Budget (OMB, 1993) have provided quantified generational accounts for the United States. The results, under the assumption that current fiscal policies are indefinitely maintained, are presented in AGK (1994), and in a highly summarized and simplified way in Table 1.

It can be seen from Table 1 that future taxes to be paid by today's elderly (aged 60 and over) fall short of the transfers they are expected to receive from the government. However, and more dramatically, taxes expected to be paid by future generations exceed the transfers they are expected to receive by \$166 thousand per man (\$83 thousand per woman). This gap amounts to a difference of 111 percent over the gap faced by current newborns (the generation aged 0 in 1991). This is a very large number, and it suggests that a heavy burden of taxation is being imposed on future generations by current fiscal policy.

It may be argued that this result is based on pessimistic assumptions. However, calculations based on much more optimistic assumptions about the discount rate (3 percent instead of 6 percent) and the growth rate of productivity (1.25 percent per annum instead of 0.75 percent) indicate that future generations will have to pay 65 percent more in taxes than current newborns. There is little doubt that future generations will have to shoulder a heavy tax burden, raising questions about the sustainability of current fiscal policy.

The previous exercise shows how generational accounts can help to evaluate the implications of current policies. They can also serve to evaluate the effect of *alternative policies*, and to

²⁰ The budget constraint under the current account target was: $\Delta K_g - \Delta B = \Delta W = T - G$ where T is taxes net of transfers. Taking present discounted values this becomes: $K_g - B = W = V(T) - V(G)$, where $V(x)$ denotes a present discounted value with the summation running from zero to infinity. Targeting government net wealth is equivalent to targeting the difference between the present discounted values of net taxes and government consumption.

²¹ There is also a definitional, and inconsequential difference in that in the current balance approach transfers are included in government expenditure, while under the Auerbach-Kotlikoff approach, they are netted out of tax payments to the government.

incorporate estimates of unbudgeted government liabilities, explicit or implicit, and of various exogenous disturbances. In that sense they are considerably more rich and informative than the overall balance, the current balance, or any other single-year budget concept. Several advanced countries including the United States, Italy, Japan and Norway have recognized this. In many ways, generational accounts would be very useful in developing countries. Of course, the calculations involved in preparing these accounts along the lines of AGK are quite intensive in skilled labor and require statistical information that may be unavailable in many developing countries.²² But this information can be developed over time. If generational accounts cannot be produced at this stage, countries should at least move to long term fiscal accounts that could be based initially on highly simplified long-term projections or even assumptions.²³ Relative to the risk of seriously misreading future fiscal pressures and imbalances, and being unprepared to face future shocks, the cost of this approach does not appear to be too high.

Table 1. United States: Composition of Male Generational Accounts^a

(Present values in thousands of dollars)

Generation's Age in 1991	Net Payments ^b
0	78.9
10	125.0
20	187.1
30	205.5
40	180.1
50	97.2
60	-23.0
70	-80.7
80	-61.1
Future Generations	166.5
Percentage difference ^c	111.1

²² AGK use pre-existing estimates of population by age and sex, fertility, mortality and immigration probabilities, productivity growth and future taxes and transfers, among others.

²³ The IMF staff, for example, routinely prepares medium-term economic and fiscal projections for the vast majority of member countries. These projections could be used as a starting point.

Source: Auerbach, Gokhale and Kotlikoff (1994)

(a) Net payments are also calculated for females. They differ somewhat from those of men because of different assumptions about labor force participation and mortality.

(b) Net tax payments minus transfers received by the government by corresponding generation.

(c) Between future generations and the generation aged zero in 1991/

7. Conclusion

The overall deficit approach to fiscal targeting presents a number of conceptual difficulties and inconsistencies. These result mainly from two elements: (i) the lack of an intertemporal dimension of its underlying budget constraint; and the inclusion of public investment among the items subject to ceilings. It is not always desirable, or feasible, to raise investment in order to increase potential output. But a country should not be prevented from doing so by conceptually misspecified budget ceilings—self imposed or accepted in the context of a program with the Fund—as long as the projects are expected to yield a sufficiently high rate of return. It is probably not right, however, to think that higher investment (in infrastructure or elsewhere) can result in a permanent increase in the rate of growth of potential output. What can be expected is that the level of per capita GDP would be permanently raised and that there would be a *temporary* increase in the rate of growth of GDP as the economy moves from one steady state to another.

Targeting the government's current account balance is equivalent to targeting the change in government net worth. This is a more sensible way to specify fiscal targets, compared with the change in gross borrowing, since net worth is the true measure of the government's bequest to future generations. Under the current account balance approach, government investment is not subject to a ceiling and is allowed to increase freely. This is appropriate as long as the rate of return on capital exceeds the cost of borrowing, domestic or international. Unfortunately, the rate of return is not known in advance, so that the risk of financing "bad" investment will increase. Funds expected to finance public "investment" could, in fact, end up financing consumption, with no favorable effect on potential output, a likely occurrence where corruption and inefficiency are prevalent. The case for shifting the program ceiling from the overall balance to the current balance is thus conceptually strong, but it is weak at

the level of practical implementation. Furthermore, it is not well supported by the empirical evidence. This suggests that, at least initially, individual investment projects in a Fund program may have to be approved on a case-by-case basis, following, where appropriate, an evaluation by the World Bank or other international or regional institutions. This approach is similar to the one contained in IMF (2004). *In practice*, it is also similar to the approach pursued by the Fund staff in some areas, for example in sub-Saharan Africa. Over an initial period, both the overall and the current account balance would be monitored by the Fund staff. In the longer run, and where the experience has been satisfactory, the overall balance would be replaced by the analytically more meaningful current account balance..

Both the overall deficit and the current account approaches lack an intertemporal dimension and therefore fail to capture the effects of policy on intergenerational transfers and the fiscal consequences of future contingencies and exogenous shocks. The system of generational accounts provides a powerful tool to analyze these issues. The framework is demanding in terms of the required statistical base and for the time being may be hard to implement in many developing countries. It should be possible for all countries, however, to prepare long term fiscal projections, based initially on simple projections or assumptions about economic and demographic trends, that could be refined over time.

Some economists have questioned the importance of capital formation as a key source of economic growth. The empirical evidence does indeed suggest that total factor productivity may well be a relatively more important source of growth than investment in many developing countries, and the attention of policy makers should refocus accordingly. However, capital formation remains a source of significant and stable, albeit unspectacular growth, and therefore deserves continued emphasis. This applies to public investment, including infrastructure, and even more so to private investment which in many developing countries continues to be held back by inadequate business taxation, high transportation costs, political and economic risks, and probably poor infrastructure.

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