# Chapter 4 Public Debt

## 4.1 The Government Budget

The government budget contains 1) spending or outlays, 2) tax revenues or receipts, and 3) the budget surplus or deficits.

**Government Outlays**

Government outlays as the total spending by the government during a period of time, are classified into three primary categories: government purchases (G), transfer payments (TR) and net interest payments (INT).

Government purchased include government investment (government spending on capital goods) and government consumption expenditures. Transfer payments are payments made to individuals for which the government does not receive current goods or services in exchange (e.g. social security benefits and medicare).

Net interest payments are the interest paid to the holders of government bonds less the interest received by the government.

Tables 4.A1-4.A5 (see Appendix) compares the ratios of government spending to GDP for 18 countries in OECD. USA and Japan are classified as the lowest rate of total government spending, as a percentage of GDP.

**Taxes**

There are major categories of tax receipts: personal income tax, corporate income tax, capital income tax and consumption tax.

**Deficits and Surpluses**

Government outlays need not equal tax revenues in each period. We can define the deficit as follows.

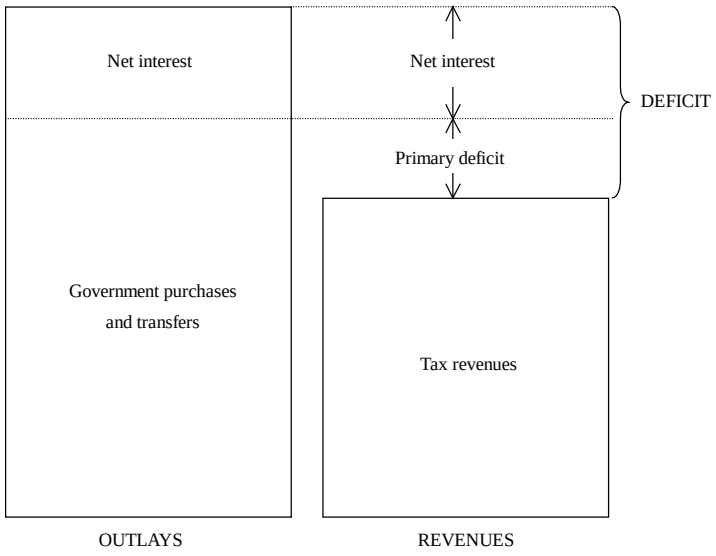
$$\begin{aligned} \text{deficit} &= \text{outlays} - \text{tax revenues} \\ &= (\text{government purchases} + \text{transfer} + \text{net interest payment}) - \text{tax revenues}\,(T) \\ &= (G + TR + INT) - T \end{aligned} \tag{1}$$

Alternative definition of deficit is called *the primary government budget deficit* which excludes net interest from government outlays.

$$\begin{aligned} \text{primary deficit} &= \text{outlays} - \text{net interest} - \text{tax revenues} \\ &= (\text{government purchases} + \text{transfer}) - \text{tax revenues} \\ &= (G + TR) - T \end{aligned} \qquad (2)$$

Figure 1 illustrates the relationship between the two concepts of deficits.

**Figure 1: The Relationship between the Total Budget Deficit and the Primary Deficit**




Source: Abel and Bernanke (2001), p.570.

These two concepts are used on different questions.

The standard budget deficit answers the question: how much does the government currently have to borrow to pay for its total outlays? The primary deficit answers the question: can the government afford its current program? Net interest payments are ignored in the primary deficit because they represent not current program costs but costs of past expenditures financed by government borrowing.[1]

[1] Under current rules, revenues and expenditures associated with social security are off-balance budget. Despite this legal distinction, a proper measure of the extent of government borrowing requires that all revenues and expenditures be taken into account. It is useful to consider the sum of the on-budget deficit (which considers only on-budget activity) and the off-budget deficit (which includes only off-budget activity) to arrive at the total deficit.

## 4.2 The Sustainability of the Fiscal Stance

Government expenditures can be financed either from taxes or by borrowing. Whatever the balance between the two, the government budget constraint must be satisfied at all times. In the short run this is usually achieved through debt finance. For the private sector to be willing to hold government debt, especially in the longer term, it must be confident that the debt will be redeemed. In other words, the fiscal stance (public finances) must be sustainable. If the debt GDP ratio is expected to rise indefinitely, then concern that government would be unable to meet its debt obligations without having to resort to monetizing the debt – which carries with it the threat of generating high inflation, or even hyperinflation – would be likely to cause the private sector to be unwilling to hold government debt. Such a situation would arise if fiscal expenditures persistently exceeded revenues by a sufficient margin. This could happen due to either high government expenditures or low tax revenues as a result of a poor tax base. If the private sector were unwilling to hold government debt, then the government would have to print money. If this situation continued, before long it would lead to hyperinflation. As previously noted, this was what happened in many of the former Soviet republics immediately after their independence. More generally, it can be shown that a necessary condition for the sustainability of the current fiscal stance is that government debt and the debt-GDP ratio are expected to remain finite.

The European Union's Stability and Growth Pact (SGP) and the United Kingdom's golden rule of public expenditures are attempts to achieve a sustainable fiscal stance. According to the SGP, no EU government is allowed a government deficit in excess of 3% of GDP or a level of debt in excess of 60% of GDP. The United Kingdom's golden rule requires a balanced budget over the business cycle. In other words, the ratio of debt to GDP should be constant over a complete cycle. It also stipulates that the government will borrow only to finance investment, not consumption, expenditures. We now consider the conditions required for the fiscal stance to be sustainable and whether the EU and U.K. fiscal rules make sense.

We begin by rewriting the government budget constraint in terms of proportions for GDP. This is more convenient for a growing economy as these proportions are likely to remain constant over time. The ratio of taxes to output can then be interpreted as the average effective tax rate. Dividing through the nominal government budget constraint, by nominal GDP $P_t y_t$ gives

$$P_t g_t + P_t h_t + (1+R_t)B_t = P_t T_t + B_{t+1} + (M_{t+1} - M_t)$$

$$\frac{P_t g_t}{P_t y_t} + \frac{P_t h_t}{P_t y_t} + \frac{(1+R_t)B_t}{P_t y_t} = \frac{P_t T_t}{P_t y_t} + \frac{B_{t+1}}{P_t y_t} + \frac{M_{t+1}}{P_t y_t} - \frac{M_t}{P_t y_t} \qquad (3)$$

This can be rewritten as

$$\frac{g_t}{y_t}+\frac{h_t}{y_t}+(1+R_t)\frac{b_t}{y_t}=\frac{T_t}{y_t}+(1+\pi_{t+1})(1+\gamma_{t+1})\left(\frac{b_{t+1}}{y_{t+1}}+\frac{m_{t+1}}{y_{t+1}}\right)-\frac{m_t}{y_t}, \qquad (4)$$

where $\gamma_t$ is the rate of growth of GDP and $T_t / y_i$ is the average tax rate.

The total nominal government deficit (or public-sector borrowing requirement, PSBR) is defined as

$$P_t D_t = P_t g_t + P_t h_t + R_t B_t - P_t T_t - \Delta M_{t+1} \quad ; \qquad (5)$$

hence $D_t / y_t$ the real government deficit as a proportion of GDP, is

$$\frac{D_t}{y_t}=\frac{g_t}{y_t}+\frac{h_t}{y_t}+R_t\frac{b_t}{y_t}-\frac{T_t}{y_t}-(1+\pi_{t+1})(1+\gamma_{t+1})\frac{m_{t+1}}{y_{t+1}}+\frac{m_t}{y_t}=(1+\pi_{t+1})(1+\gamma_{t+1})\frac{b_{t+1}}{y_{t+1}}-\frac{b_t}{y_t} \qquad (6)$$

The right-hand side shows the net borrowing required to fund the deficit expressed as a proportion of GDP.

We also define the nominal primary deficit $P_t d_t$ (the total deficit less debt interest payments) as

$$P_t d_t = D_t - R_t B_t \quad . \qquad (7)$$

Hence the ratio of the primary deficit to GDP is

$$\frac{d_t}{y_t}=\frac{g_t}{y_t}+\frac{h_t}{y_t}-\frac{T_t}{y_t}-(1+\pi_{t+1})(1+\gamma_{t+1})\frac{m_{t+1}}{y_{t+1}}+\frac{m_t}{y_t}=-(1+R_t)\frac{b_t}{y_t}+(1+\pi_{t+1})(1+\gamma_{t+1})\frac{b_{t+1}}{y_{t+1}} \qquad (8)$$

Equations (6) and (8) are both difference equations that determine the evolution of $b_t / y_t$. One is expressed in terms of the total deficit, the other in terms of the primary deficit. Since the nominal rate of growth $\pi_{t+1}+\gamma_{t+1}$ is nearly always strictly positive, equation (6) is an unstable difference equation and hence must be solved forwards. In contrast, equation (8) could be a stable or an unstable difference equation, depending on whether

$$\frac{1+R_t}{(1+\pi_{t+1})(1+\gamma_{t+1})}$$

is greater than (unstable) or less than (stable) unity. If the difference equation is stable, then $b_t / y_t$ will remain finite. But if it is unstable, then $b_t / y_t$ could be finite or infinite. A finite debt-GDP ratio is necessary (but not sufficient) for the private sector to be willing to hold government debt. An exploding debt-GDP ratio is sufficient for the fiscal stance to be unsustainable. We therefore wish to find the conditions under which $b_t / y_t$ remains finite.

We begin by examining equation (8). For simplicity, we assume that $R_t$, $\pi_t$ and $\gamma_t$ are constant. A more general analysis that allows these variables to be time-varying can be found in Polito and Wickens (2007). It then follows that

$$\frac{d_t}{y_t} = \frac{g_t}{y_t} + \frac{h_t}{y_t} - \frac{T_t}{y_t} - (1+\pi)(1+\gamma)\frac{m_{t+1}}{y_{t+1}} + \frac{m_t}{y_t} = -(1+R)\frac{b_t}{y_t} + (1+\pi)(1+\gamma)\frac{b_{t+1}}{y_{t+1}} \quad .$$

The debt-GDP ratio therefore evolves according to the difference equation

$$\frac{b_t}{y_t} = -\frac{1}{1+R}\frac{d_t}{y_t} + \frac{(1+\pi)(1+\gamma)}{1+R}\frac{b_{t+1}}{y_{t+1}} \tag{9}$$

**Case 1:** $[(1+\pi)(1+\gamma)]/(1+R) > 1$ **(Stable Case)**

In this case the rate of growth of nominal GDP is greater than the nominal rate of interest, i.e., $R < \pi + \gamma$. We therefore write the GBC, equation (9), as the difference equation

$$\frac{b_{t+1}}{y_{t+1}} = \frac{1+R}{(1+\pi)(1+\gamma)}\frac{b_t}{y_t} + \frac{1}{(1+\pi)(1+\gamma)}\frac{d_t}{y_t} \quad . \tag{10}$$

As $0 < (1+R)/[(1+\pi)(1+\gamma)] < 1$, this is a stable difference equation, and hence can be solved *backwards* by successive substitution. For $n > 0$ we obtain

$$\frac{b_{t+1}}{y_{t+1}} = \left(\frac{1+R}{(1+\pi)(1+\gamma)}\right)^n \frac{b_t}{y_t} + \frac{1}{(1+\pi)(1+\gamma)}\sum_{s=0}^{n-1}\left(\frac{1+R}{(1+\pi)(1+\gamma)}\right)^{n-s-1}\frac{d_{t+s}}{y_{t+s}} \quad .$$

Taking the limit as $n \to \infty$ and noting that

$$\lim_{n\to\infty}\left(\frac{1+R}{(1+\pi)(1+\gamma)}\right)^n \frac{b_t}{y_t} = 0 \quad ,$$

we obtain

$$\lim_{n\to\infty}\frac{b_{t+1}}{y_{t+1}}=\frac{1}{(1+\pi)(1+\gamma)}\sum_{s=0}^{\infty}\left(\frac{1+R}{(1+\pi)(1+\gamma)}\right)^{n-s-1}\frac{d_{t+s}}{y_{t+s}} \quad . \tag{11}$$

We now examine the implications of equation (11).

**Implications**

(1) In the special case where the ratio of the primary deficit to GDP is expected to remain unchanged in the future i.e.,

$$\frac{d_{t+s}}{y_{t+s}}=\frac{b_t}{y_t} \quad \text{for } s\geq 0 \quad ,$$

equation (11) becomes

$$\lim_{n\to\infty}\frac{b_{t+1}}{y_{t+1}}=\frac{1}{(1+\pi)(1+\gamma)-(1+R)}\frac{d_t}{y_t}\tilde{-}\frac{1}{\pi+\gamma-R}\frac{d_t}{y_t}>0 \quad . \tag{12}$$

Hence, if $\pi+\gamma>R$, the debt-GDP ratio will remain finite regardless of the initial value of $d_t/y_t$. Hence fiscal policy is sustainable for any value of $d_t/y_t$. There can even be a permanent primary deficit (i.e., $d/y>0$) and the debt-GDP ratio will be constant.

(2) In principle, fiscal sustainability only requires that the debt-GDP ratio remains finite and that the market is willing to hold government debt. In general, therefore, $d_{t+s}/(y_t+s)$ can vary over time. As the debt-GDP ratio rises, however, fears of default may increase. Prudential reasons therefore tend to limit the acceptable size of this ratio. As a result, it is common in practice to impose an upper limit on the debt-GDP ratio, as in the SGP. The precise choice of upper limit is inevitably somewhat arbitrary. The market has shown that it is willing to continue to hold government debt for higher values of the debt-GDP ratio than that prescribed by the SGP. When fiscal policy is not sustainable at the announced limit, there may be a temptation to raise the limit. The drawback is that doing this repeatedly would damage the credibility of fiscal policy.

(3) Although not strictly necessary, in order to give fiscal policy greater clarity – and hence make it more accountable – a government might wish to achieve a particular debt-GDP ratio in period $t+n$. This might be the same value as for period $t$. The government

might even go a step further and want both $b_t / y_t$ and $d_t / y_t$ to be constant for all future $t$. From equation (12) this would imply that the following condition should be satisfied:

$$\frac{b_t}{y_t} \geq \frac{1}{\pi + \gamma - R} \frac{d_t}{y_t} \quad . \tag{13}$$

The equality sign in equation (12) has been replaced by an inequality sign as the fiscal stance is sustainable provided the evolution of debt (as given by the right-hand side) does not exceed the target debt-GDP ratio. More generally, this enables us to find the debt-GDP ratio for any constant $d_t / y_t$ and any constant value of $\pi + \gamma - R$ that is positive. In other words, fiscal sustainability may be satisfied, but at a different value of the debt-GDP ratio from the one that was wanted.

(4) We could have obtained this result directly from the GBC, equation (9), by rewriting it as

$$(1+\pi)(1+\gamma)\Delta \frac{b_{t+1}}{y_{t+1}} = -(\pi + \gamma - R)\frac{b_t}{y_t} + \frac{d_t}{y_t} = 0 \quad .$$

If the debt-GDP ratio is constant, then $\Delta(b_{t+1} / y_{t+1}) = 0$. We then obtain equation (13).

(5) Not only may the fiscal stance be sustainable when there is a permanent primary deficit, there may also be a permanent *total* deficit. As

$$\frac{D_t}{y_t} = \frac{d_t}{y_t} + R\frac{b_t}{y_t}$$

we have

$$\begin{aligned} \frac{b_t}{y_t} &\geq \frac{1}{\pi + \gamma - R}\frac{d_t}{y_t} \\ &\geq \frac{1}{\pi + \gamma - R}\left(\frac{D_t}{y_t} - R\frac{b_t}{y_t}\right) \\ &\geq \frac{D_t / y_t}{\pi + \gamma} \quad . \end{aligned} \tag{14}$$

$D_t > 0$ implies that fiscal sustainability is also consistent with having a permanent total deficit. In particular, although often regarded as a requirement for sound fiscal policy, a balanced budget is unnecessary for fiscal sustainability.

**Case 2:** $0 < [(1+\pi)(1+\gamma)]/(1+R) < 1$ **(Unstable Case)**

In this case $R > \pi + \gamma$: the nominal rate of interest is greater than the rate of growth of nominal GDP. The GBC is now an unstable difference equation. It must therefore be solved *forwards*, not backwards, as follows:

$$\frac{b_t}{y_t} = \left(\frac{(1+\pi)(1+\gamma)}{1+R}\right)\frac{b_{t+1}}{y_{t+1}} - \frac{1}{1+R}\frac{d_t}{y_t} = \left(\frac{(1+\pi)(1+\gamma)}{1+R}\right)^n \frac{b_{t+1}}{y_{t+1}} - \frac{1}{1+R}\sum_{s=0}^{n-1}\left(\frac{(1+\pi)(1+\gamma)}{1+R}\right)^s \frac{d_{t+s}}{y_{t+s}}$$

Taking limits as $n \to \infty$, if

$$\lim_{n\to\infty}\left(\frac{(1+\pi)(1+\gamma)}{1+R}\right)^n \frac{b_{t+1}}{y_{t+1}} = 0 \quad , \tag{15}$$

then

$$\frac{b_t}{y_t} \le \frac{1}{1+R}\sum_{s=0}^{\infty}\left(\frac{(1+\pi)(1+\gamma)}{1+R}\right)^s\left(\frac{-d_{t+s}}{y_{t+s}}\right) \quad , \tag{16}$$

where $-d_t > 0$ is the primary *surplus*. We introduce the inequality sign because a present value of current and future surpluses that exceeds the current debt-GDP ratio is also consistent with fiscal sustainability. The terminal condition, equation (15), is known as the no-Ponzi condition. It rules out funding debt interest payments by issuing more debt. (A Ponzi game is a pyramid system in which contributors are paid interest on their investments and the interest payments are paid from the investments of new contributors. At some points the pyramid will, of course, collapse due to an insufficient number of new investors.)

**Implications**

(1) The right-hand side of equation (16) is the present value of current and future primary *surpluses* as a proportion of GDP. Thus, for fiscal sustainability, these must be sufficient to meet current debt obligations. This allows $d_t / y_t$ to vary through time. One of the factors that cause $d_t / y_t$ to vary is the business cycle; $d_t / y_t$ tends to be positive in a recession and negative in a boom. A practical way to interpret the condition for fiscal sustainability is to require that the present value of primary surpluses over a complete

business cycle is zero. As a result, the debt-GDP ratio would rise during a recession, fall during a boom, but remain constant over the whole cycle. This is the basis of the U.K. government's golden rule for fiscal policy.

(2) In the special case where

$$\frac{d_{t+s}}{y_{t+s}} = \frac{d_t}{y_t} \quad \text{for all } s > 0 \ ,$$

we find that

$$\frac{b_t}{y_t} \leq \frac{1}{1+R} \sum_{s=0}^{\infty} \left( \frac{(1+\pi)(1+\gamma)}{1+R} \right)^s \left( \frac{-d_t}{y_t} \right) \underset{-}{\sim} \frac{1}{R+\pi-\gamma} \left( \frac{-d_t}{y_t} \right) \ . \tag{17}$$

When the equality sign holds this is the same result as in the stable case, except that because the sign of $R-(\pi+\gamma)$ is now reversed, the sign of $d$ is also reversed (i.e., we need surpluses to pay off the debt). The inequality sign reflects the fact that a positive present value will also allow current debts to be paid off. We note that the inequality sign in the unstable case is the opposite of that in the stable case. The reason for the difference is that in the stable case future primary deficits must not cause the *future* debt-GDP ratio to exceed a given upper limit, whereas in the unstable case future primary surpluses must be large enough to meet *current* debt liabilities.

(3) Again, although it is necessary to have primary surpluses, it is still possible to have a total deficit. As

$$\frac{D_t}{y_t} = \frac{d_t}{y_t} + R\frac{b_t}{y_t}$$

we have

$$\frac{b_t}{y_t} \leq \frac{1}{R-\pi-\gamma} \left( \frac{-d_t}{y_t} \right) \tag{18}$$

$$\leq \frac{1}{R-\pi-\gamma} \left( R\frac{b_t}{y_t} - \frac{D_t}{y_t} \right)$$

$$\geq \frac{D_t / y_t}{\pi+\gamma} \ . \tag{19}$$

This is identical to equation (14) – even the inequality sign is the same. Three cases may

be distinguished:

$\frac{b}{y} > \frac{1}{\pi + \gamma}\frac{D}{y}$ , falling debt-GDP ratio,

$\frac{b}{y} = \frac{1}{\pi + \gamma}\frac{D}{y}$ , constant debt-GDP ratio,

$\frac{b}{y} < \frac{1}{\pi + \gamma}\frac{D}{y}$ , rising debt-GDP ratio.

The first two are sustainable fiscal stances, but the third – where the debt-GDP ratio is rising – is ultimately unsustainable.

(4) Consider what would happen if a government had existing debts but maintained a zero primary deficit (i.e., $d_t / y_t = 0$). In order to meet the interest charges on existing debt, the government must issue more debt. Debt would therefore accumulate without limit. In this case the budget constraint can be written as

$$\frac{b_t}{y_t} = \frac{(1+\pi)(1+\gamma)}{1+R}\frac{b_{t+1}}{y_{t+1}}$$

and hence

$$\frac{b_t}{y_t} = \lim_{n\to\infty}\left(\frac{(1+\pi)(1+\gamma)}{1+R}\right)^n \frac{b_{t+n}}{y_{t+n}}$$

This no-Ponzi game condition implies that only zero initial debt would be consistent with this limit tending to zero, and hence satisfy equation (15). If initial debt is not zero, then a primary surplus is required, otherwise debt will grow too fast.

**The Optimal Level of Debt**

As a final observation on these results we note that although they tell us how to run fiscal policy to sustain a given level of debt, and what the debt consequences will be of running a given deficit, they do not tell us what the optimal level of debt is. In effect, we are taking the current debt-GDP ratio as given; sustainable fiscal policy simply seeks to maintain this debt-GDP ratio. In practice, countries have different debt-GDP ratios. This suggests that a country can change its debt-GDP ratio if it wishes, and this too would be sustainable at an appropriate level of the fiscal deficit compatible with the sustainability condition above.

Sargent and Wallace (1981), in an article entitled "Some unpleasant arithmetic", have suggested that there is an upper limit to the debt-GDP ratio above which financial markets would not be willing to hold more government debt. Beyond this point, they argue, the government would need to use money finance. The title of their paper reflects the possibility that the resulting rate of growth of the money supply may exceed the target set by the monetary authority. This is an example of how fiscal policy may destabilize monetary policy.

Further references on fiscal sustainability are Bohn (1995), Polito and Wickens (2007), and Wilcox (1989).

## 4.3 The Burden of the Government Debt

The commonly held view that the current government debt is the burden on the future generations ignores the fact that most government bonds are owned by its citizens. Therefore, although descendants may face heavy taxes to pay the interest and principal of the government debt, these future taxpayers also will inherit the government bonds and thus will be the recipients of interests and principal payments. To a substantial degree, we owe the government debt to ourselves, so the debt isn't a burden in the same sense that it would be if it were owed entirely to outsiders.

The government borrows from its own citizens – the obligation is an *internal debt*. Lerner (1948) argues that an internal debt creates no burden for the future generation. Members of the future generation simply owe it to each other. When the debt is paid off, there is a transfer of income from one group of citizens (those who do not hold bonds) to another (bondholders). However, the future generation as a whole is no worse off in the sense that its consumption level is the same as it would have been, except for income distribution effect.

In case of *external debt* (borrowing from abroad), the future generation certainly bears a burden, because its consumption level is reduced by an amount equal to the loan plus the accrued interest that must be sent to foreign lenders. If the loan is used to finance capital accumulation, the outcome depends on the project's productivity. If the marginal return on the investment is greater than the marginal cost of funds obtained abroad, the combination of the debt and capital expenditure actually makes the future generation better off. To the extent that the project's return is less than the marginal cost, the future generation is worse off.

Economists pointed out several ways in which the government debt can be a burden on future generations.

First, if tax rates have to be raised substantially in the future to pay off the debt, the resulting distortions could cause the economy to function less efficiently and impose costs on future generations.

Second, most people hold small amounts of government bonds or no government bonds at all. In the future, people who hold few or no bonds may have to pay more in taxes to pay off the government debt than they receive in interest and principal payments; people holding large quantities of bonds may receive more in interest and principal than they pay in increased taxes. Bondholders are richer on average than nonbondholders, so the need to service the government debt might lead to a transfer of resources from the relatively poor to the relatively rich. This transfer can be offset by other tax and transfer policies – for example, by raising taxes on high-income people.

Third, many economists claim that government deficits reduce national saving. When the government runs a deficit, the economy accumulates less domestic capital and fewer foreign assets than it would have if the deficit had been lower. If this argument is correct, deficits will lower the standard of living for our children and grandchildren, both because they will inherit a smaller capital stock and because they will have to pay more interest to foreigners than they otherwise would have. This reduction in the future standard of living would constitute a true burden of the government debt.

## 4.4 Ricardian Equivalence

The idea that tax cuts do not affect desired consumption and (therefore) also do not affect desired national saving, is called the *Ricardian equivalence proposition*. According to this idea, in the long run, all government purchases must be paid for by taxes. Thus, if the government's current and planned purchases do not change, a cut in current taxes can affect the *timing* of tax collection but not the ultimate tax burden borne by consumers. A current tax cut with no change in government purchases does not really make consumers any better off (any reduction in taxes today is balanced by tax increases in the future), so they have no reason to respond to the tax cut by changing their desired consumption. In other words, the current tax cut is balanced by an increase in expected future taxes, it does not make taxpayers any better off in the long run despite raising their current after-tax incomes.

Although the logic of the Ricardian equivalence proposition is sound, many economists question whether it makes sense in practice. One reason that consumption may rise after a tax cut is that many – perhaps most – consumers do not understand that increased government borrowing today is likely to lead to higher taxes in the future. Thus consumers may simply respond to the current tax cut, as they would to any other increase in current income, by increasing their desired consumption we call this type of consumer *myopic*.

**Ricardian Equivalence across Generations**

The argument for Ricardian equivalence rests on the assumption that current government borrowing will be repaid within the lifetime of people who are alive today. What if some of the debt the government is accumulating will be repaid not by the people who receive the tax cut but by their children or grandchildren?

Barro (1974) shows, in theory, Richardian equivalence may still apply even if the current generation receives the tax cut and future generations bear the burden of repaying the government's debt. Suppose that the gift of debt is a one-off event and that taxation must be used to service the debt and to meet its repayment[2]. When future tax liabilities are taken into account, the present discounted value of wealth becomes

$$W^1 = W^0 + D - DTL \tag{20}$$

where $W^0$ is the consumers wealth before receiving the bonds, $W^1$ is the level of wealth after receiving the bonds, $D$ is the value of bonds received and $DTL$ is the discounted tax liabilities arising due to the issue of the debt. Two different assumptions on the structure of repayment of the debt are now shown to generate the same neutrality conclusion.

First, we consider the case that the bond is paid off with interest the year after issue and the same set of consumers is alive in both years (i.e. Ricardian equivalence within generation). In this case, with interest rate $r$, the interest and principal paid the year after issue is given by $(1+r)D$. Discounting this back to the present shows that $DTL$ has the value.

$$DTL = \frac{(1+r)D}{(1+r)} = D \tag{21}$$

Substituting (21) into (20) shows that the issue of the debt has no effect upon wealth. This is a consequence of the recipients of the bonds realizing that they face the tax liability for its redemption. The receipt of the bond is therefore not treated as an increase in wealth.

Second, we assume a bond that is never redeemed but on which interest is paid in perpetuity and consumers who have infinite lifespans. In this case, the discounted tax liabilities must be equal to the discounted value of the stream of interest payments. This gives

$$DTL = \int_0^{\infty} rDe^{-rt}dt = D \tag{22}$$

[2] The following expositions are taken from Myles (1995), pp.500-1.

where $rD$ is the tax payment per period. Thus $DTL = D$ and the bond again has no effect upon net wealth. As far as the current generation cares about the well-being of the next generation via altruism, the current generation would not increase their consumption in reponse to a tax out but transfer the same amount to their children. As a result, deficits created by tax cuts shouldn't reduce national saving and therefore shouldn't burden future generations.

**Departure from Ricardian Equivalence**

The main arguments against Ricardian equivalence are the possible existence of borrowing constraints, consumers' shortsightedness, the failure of some people to leave bequests, and the non-lump-sum nature of most tax changes.

1. **Borrowing constraints** A person who wants to consume more, but who is unable to borrow to do so, will be eager to take advantage of a tax cut to increase consumption. Thus the existence of borrowing constraints may cause Ricardian equivalence to fail.
2. **Short sightedness (Myopia)** If people are shortsighted, they may respond to a tax cut by consuming more, contrary to the prediction of Ricardian equivalence.
3. **Failure to leave bequests** Some people may not leave bequests because they expect their children to be richer than they are and thus not need any bequest. If people continue to hold this belief after they receive a tax cut, they will increase their consumption and again Ricardian equivalence will fail.
4. **Non-lump-sum taxes** Ricardian equivalence holds only for lump-sum-tax changes, with each person's change in taxes being a fixed amount that doesn't depend on the person's economic decisions, such as how much to work or save. Thus non-lump-sum tax cuts will have real effects on the economy, in contrast to the simple Ricardian view.

**Empirical Results of Ricardian Equivalence**[3]

Table 1 summarizes the methodologies and results of studies that estimates aggregate consumption functions in order to assess the real impact of deficits. At first glance, conclusions vary from author to author. But if we interpret results properly, virtually all studies indicate that every dollar of deficits stimulates between $0.20 and $0.50 of current consumer spending.

Apparent differences in results can in most cases be traced to different formulations of the null hypothesis. A number of authors set out to estimate an equation such as the following:

[3] In this section I draw heavily from Bernheim (1987).

$$C_t = \alpha_0 + \alpha_1(y_t - T_t) + \alpha_2(T_t - G_t - r_t D_t) + \alpha_3 G_t + \alpha_4 D_t + \alpha_5 W_t t X_t \alpha + \varepsilon_{t'} \qquad (23)$$

where *C* is consumption, *Y* is national income, *T* is tax revenues, *G* is government spending, *D* is debt, *W* is private wealth, *r* is the interest rate, *X* is a vector of other exogenous variables, and $\varepsilon$ is an error term.

The null hypothesis is $\alpha_2 = 0$, the alternative is "tax discounting hypothesis" which holds that consumers at least partially anticipate future taxes.

The second group of authors estimate

$$C_t = \beta_0 + \beta_1 y_t + \beta_2(T_t - G_t - r_t D_t) + \beta_3 G_t + \beta_4 D_t + \beta_5 W_t + X_t \beta + \zeta_t \qquad (24)$$

The null hypothesis with this equation is $\beta_2 = 0$ which corresponds to pure Ricardian equivalence.

It is useful to note that equations (23) and (24) are "almost" the same. Specifically, if the interest rate is time-invariant, then one obtain (24) from (23) through a linear transformation of variables. The coefficients and error terms are then related as follows: $\beta_0 = \alpha_0$, $\beta_1 = \alpha_1$, $\beta_2 = \alpha_2 - \alpha_1$, $\beta_3 = \alpha_3 - \alpha_1$, $\beta_5 = \alpha_5$, $\underline{\beta} = \underline{\alpha}$ and $\zeta_t = \varepsilon_t$, $\alpha_2 = 0(\beta_2 = -\beta_1)$ represents the pure Keynesian view, $\alpha_2 = \alpha_1(\beta_2 = 0)$ represents perfect Ricardian equivalence, and $\alpha_1 - \alpha_2(\beta_2)$ measures the effect on current consumption of a \$1 tax-for-deficit swap.

**Table 1: Summary of Consumption Function Studies**

| Study | Key omitted | | | | Deficit effect | | |
|---|---|---|---|---|---|---|---|
| | Data | Variables | Technique | Instruments | $\alpha_2$ | $-\beta_2$ | Debt effect |
| Tanner (1970) | Canadian, Q, 1951-67 | DEF, GS, W, MTR | OLS, L | NA | NA | NA | 0.034 (0.018) to 0.040 (0.017) |
| Kochin (1974) | U.S., A, 1952-71 | GS, W, DEBT, MTR | OLS, L, D | NA | 0.096 (0.048) to 0.276 (0.120) | NA | NA |
| Yawitz and Meyer (1976) | U.S., A, 1953-67 | DEBT, MTR | OLS, L | NA | NA | NA | 0.05 (0.013) |
| Tanner (1978) | U.S., A, 1929-40, 1947-71 | MTR | OLS, L | NA | 0.220 (0.076) to 0.279 (0.067) | NA | NA |
| Tanner (1979) | U.S., A, 1947-74 | DEBT, MTR | OLS, L | NA | 0.291 (0.088) | NA | -0.014 (0.38) |
| Barro (1978) | U.S., A, 1928-74 | MTR | OLS, L | NA | 0.05 (0.08) to 0.22 (0.06) | NA | NA |
| Feldstein (1982a) | U.S., A, 1930-76 | MTR | 2OLS, L | T(-1), Y(-1) | -0.083 (0.131) to –1.73 (2.27) | 0.222 (0.247) to 0.276 (0.086) | 0.023[a] to 0.175 (0.179) |
| Seater (1982) | U.S., A, 1929-76 | MTR | OLS, L | NA | -0.15 (0.10) to 0.29 (0.10) | NA | -0.002 (0.08) to 0.11 (0.03) |
| Kormendi (1983) | U.S., A, 1929-76 | MTR | OLS, L | NA | NA | -0.01 (0.10) to –0.07 (0.08) | -0.055 (0.018) to –0.032 (0.020) |
| Seater and Mariano (1985) | U.S., A, 1929-75 | Corporate MTR | 2SLS, L | MG, STR, WCR[b] | NA | -0.146 (0.465) to 0.176 (0.575) | -0.012 (0.101) to 0.026 (0.125) |
| Evans (1985) | U.S., A, 1901-29 | W, MTR | 2SLS, L | NA | NA | -0.307 (0.763) to 0.273 (0.132) | -0.041 (0.062) to –0.028 (0.061) |
| Reid (1985) | U.S., MA, 1890-1981 | DEBT, MTR | OLS, L | NA | NA | 0.140 (0.080) to 0.441 (0.180) | NA |
| Boskin (1985) | U.S., A,[c] | MTR | OLS, L | NA | -0.014 (0.102) to 0.219 (0.072) | 0.327 (0.089) to 0.403 (0.089) | 0.03[d] |
| Modigliani and Sterling (1986) | U.S., A, 1949-84 | MTR | OLS, L | NA | -0.100 (0.132) to 0.187 (0.069) | NA | 0.073 (0.024) to 0.106 (0.033) |

Source: Bernheim (1987), Table 1.

Key:
- Q: quarterly
- A: annual
- MA: multiple year average
- DEF: government deficits
- GS: government spending
- DEBT: government debt
- W: private wealth
- MTR: marginal tax rate
- T(-1): lagged taxes
- Y(-1): lagged income
- MG: money growth
- STR: statutory tax rates
- WCR: wartime casualty rates
- NA: not applicable

Look at Table 1, the column labeled "$\alpha_2$" under the heading "Deficit Effect" reveals that most estimates tend to cluster around 0.25 the highest is 0.29, and a number of estimates are substantially lower. These evidences uniformly support the view that a $1 deficit-for-taxes swap raises consumption by at least $0.40 to $0.50, and one can be extremely confident that the estimated effect exceeds $0.10 to $0.20.

Inspection of the $-\beta_2$ column reveals a somewhat more conservative picture. The median estimate is around 0.2, although the range of estimates is quite large.

Table 1 contains a column labeled "Debt Effect". To evaluate, these coefficients, one should compare them to marginal propensities to consume out of other forms of private wealth. Various studies place this propensity around 0.03 to 0.05. This fact supports the view that government bonds are net wealth.

Note that the preponderance of studies in Table 1 employs OLS. Failure to treat potential endogeneity is a serious omission. Shocks to consumption may be correlated with shocks to

income, which in turn raise tax revenues (lower deficits). Thus, there is a natural bias in favor of Ricardian equivalence, even in a Keynesian world. Table 1 also contains a partial listing of "Key omitted variables". A number of studies fail to include either a measure of government deficits or debt. Such studies are naturally less informative, and tend to confound the effects of debts and deficits, which are correlated. Others omit a measure of government spending. Since deficits are highly correlated with spending, and since government consumption appears to be a substitute for private consumption, this creates a bias in favor of Ricardian equivalence. All studies fail to include measures of marginal tax rates.

Tests of the consumption Euler equation specification are generally unfavorable to the stochastic permanent income model of aggregate consumption. Yet this finding may reflect factors that have nothing to do with Ricardian equivalence (such as failure of conditions for valid aggregation). As long as the Euler equation is misspecified, one cannot use it to measure the effects of deficits. Ricardian equivalence may fail for reasons that do not invalidate this specification (for example, consumers plan consumption and saving rationally, but are myopic about the link between current deficits and future taxes). In addition, it is difficult to gauge the power of such tests against interesting alternative (failure to reject may result from imprecision).

A succession of time series studies has established the existence of a robust short-rum relationship between deficits and aggregate consumption. While there are many potential explanations for this pattern, it is at least consistent with the traditional Keynesian view.

Bernheim (1987) conducts an alternative empirical investigation by measuring the effects of government borrowing through international comparisons.

This approach offers certain natural advantages. First, there is much more independent movement of deficits and government spending across countries than there is within countries. Second, by averaging over substantial periods of time, one can hope to measure the more permanent components of each variable, and thereby minimize problems arising from the informational and expectational issues. In addition, results based on multiperiod averages may provide some clue as to the long-run effects of sustained deficits. Finally, if one is willing to forego multiyear averages and pool time-series cross-section data (using a between estimation), one can greatly expand the number of available observations.

On the other hand, cross-country comparisons hardly provide a panacea. Several problems become much more serious. First, the relevant variables may be measured differently in different countries. Second, countries differ-structurally in terms of institutions, and the population of each country may behave somewhat idiosyncratically. Third, deficits may move for reasons unrelated to the Ricardian hypothesis. Finally, practical considerations may seriously limit the number of observations available for analysis.

It is difficult to weigh the relative importance of these advantages and disadvantages a priori. Evidence from cross-country comparisons is neither definitive nor irrelevant.

Overall, empirical analysis of cross-country data supports the view that government deficits stimulate private consumption (see Bernheim (1987), pp.292-99 for detail).

## 4.5 Generational Accounting

### 4.5.1 Methodology[4]

General Accounting is based on the government's intertemporal budget constraint. This constraint, equation (17), requires that the future net tax payments of current and future generations be sufficient, in present value, to cover the present value of future government consumption as well as service the government's initial net indebtedness[5].

$$\sum_{k=t-p}^{t} N_{t,k} + (1+r)^{-(k-t)} \sum_{k=t+1}^{\infty} N_{t,k} = \sum_{s=t}^{\infty} G_s (1+r)^{-(s-t)} - w_t^g \qquad (25)$$

The first summation on the left-hand side of equation (25) adds together the generational accounts – the present value of the remaining lifetime net payments – of existing generations. The term $N_{t,k}$ stands for the account of the generation born in year *k*. The index *k* in this summation runs from *t-D* to *t*. The second summation on the left-hand side of equation (25) adds together the present values of the generational accounts of future generations, with *k* again representing the year of birth. As each of these generational accounts is expressed in dollars of the respective generations' birth year, they must be discounted back to year *t* in the summation, using the government's real before-tax return *r*.

The first term on the right-hand side of equation (25) expresses the present value of government consumption. In this summation, the values of government consumption in year *s*, given by $G_s$, are also discounted to year *t*. The remaining term on the right-hand side, $W_t^g$, denotes the government's net wealth in year *t* – its assets minus its explicit debt.

Equation (25) indicates the zero-sum nature of intergenerational fiscal policy. Holding the present value of government consumption fixed, a reduction in the present value of net taxes extracted from current generations necessitates an increase in the present value of net tax payments of future generations.

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4 This section is based on Auerback, Kotlikoff and Leibfritz (1999) Chapter 2.

5 The constraint does not assume that government debt is ever fully paid off, merely that the debt grows less quickly than the rate of discount – that it does not explode.

The generational account $N_{t,k}$ is defined by,

$$N_{t,k} = \sum_{s=\kappa}^{k+D} T_{s,k} P_{s,k} (1+r)^{-(s-\kappa)} \qquad (26)$$

where $\kappa = \max(t,k)$. In expression (26) $T_{s,k}$ stands for the projected average net tax payment to the government made in years by a member of the generation born in year *k*.

The term $p_{s,k}$ stands for the number of surviving members of the cohort in year *s* who were born in year *k*. For generations who are born prior to year *t*, the summation begins in year *t* and its discounted to year *t*. For generations who are born in year *k*>*t*, the summation begins in year *k* and is discounted to that year.

A set of generational accounts is simply a set of values of $N_{t,k}$, one for each existing and future generation, with the property that the combined present value adds up to the right-hand side of equation (25).

The generational accounting tells us which generations will pay for government spending not included in the accounts, rather than telling us which generations will benefit from that spending.

**Assumptions**

To produce general accounts, we require projections of population, taxes, transfers and government expenditures: an initial value of government wealth; and a discount rate. We consider the impact of total, not just national government.

We assume that government purchases grow at the same rate as GDP, although in some cases we break these purchases down into age-specific components and assume that each component remains constant per member of the relevant population, adjusted for the overall growth of GDP per capita.

Government infrastructure purchases are treated like other forms of purchases in the calculations. Generational accounting clarifies which generation or generations will have to bear the burden of these and other purchases.

Taxes and transfers payments are each broken down into several categories. General rate is that taxes are borne by those paying the taxes, when the taxes are paid.

The typical method used to project the average values of particular taxes and transfer payments by age and sex starts with government forecasts of the aggregate amounts of each type of tax (e.g. payroll) and transfer payment (e.g. welfare benefits) in future years. These aggregate amounts are then distributed by age and sex based on cross-sectional relative age-tax

and age-transfer profiles derived from cross-sectional microdata sets. For years beyond those for which government forecasts are available, age-and sex – specific average tax and transfer amounts are assumed to equal those for the latest year for which forecast are available, with an adjustment for growth.

### 4.5.2 Results from Japan[6]

*The Main Findings*

Table 3 presents the basic results of generational accounting in Japan (using 1995 as the base year). They are divided into two cases: case A, in which educational expenditures are treated as consumption; and case B, in which they are treated as transfers. This distinction accounts for some differences for generations between ages 0 and 24. The percentage imbalance between newborn and future generations is 169 percent for case A and 338 percent for case B, which implies that future generations must pay about 2.7 times as much tax (net basis) as new born generations for case A and about 4.4 times as much for case B. This is a huge difference.

Given the same fiscal policy, the generational imbalance is very sensitive to real income growth and discount-rate assumptions. According to demographic projections, the aging process will reach a peak in 2050, after which society will get younger. The fiscal position is also expected to ease after 2050. The higher real income growth rate will reduce the burden of future generations because of a bigger improvement in fiscal position after 2050. On the other hand, the higher discount rate will increase the burden of future generations because the fiscal position will be heavily discounted.

[6] This part depends on Takayama and Kitamura (1999).

**Table 2: Generational Accounting: The Base Case**

(Thousands of U.S.$)

| Generation's age in 1995 | Case A: Education as Consumption | Case B: Education as Transfers |
|---|---|---|
| 0 | 143.4 | 73.0 |
| 5 | 169.3 | 90.9 |
| 10 | 200.1 | 135.4 |
| 15 | 235.9 | 187.4 |
| 20 | 278.1 | 257.4 |
| 25 | 295.2 | 295.2 |
| 30 | 297.8 | 297.8 |
| 35 | 287.4 | 287.4 |
| 40 | 263.8 | 263.8 |
| 45 | 227.7 | 227.7 |
| 50 | 173.1 | 173.1 |
| 55 | 99.0 | 99.0 |
| 60 | 11.9 | 11.9 |
| 65 | -47.7 | -47.7 |
| 70 | -44.8 | -44.8 |
| 75 | -36.0 | -36.0 |
| 80 | -26.7 | -26.7 |
| 85 | -18.2 | -18.2 |
| 90 | -9.7 | -9.7 |
| Future Generations | 386.2 | 319.4 |
| Generational Imbalance (%) | 169.3 | 337.8 |

Notes: Case A treats educational expenditures as consumption; case B treats educational expenditures as transfers. The exchange rate is assumed to be 93.37 yen per U.S. dollar (1995 average); real income growth is assumed to be 1.5 percent; and the discount rate is assumed to be 5 percent.

If we are only concerned with the net present values of payments after 1995, Table 2 indicates that they are positive for individuals aged 64 or younger and negative for individuals aged 65 or older. This is partly due to the fact that tax payments and social-security contributions that old generations made when they were young are ignored in this calculation, and also partly due to large intergenerational transfers from young to old generations via fiscal policy. If redistribution policy is biased toward old generations, the fiscal burden of future generations will increase as the aging process advances.

**Table 3: Decomposition of Generational Imbalance**

| Case | Base case | No demographic change | Zero debt |
|---|---|---|---|
| A | 169.3 | 42.19 | 154.50 |
| B | 337.8 | 77.21 | 308.64 |

Notes: Case A treats educational expenditures as consumption; case B treats educational expenditures as transfers. Real income growth is assumed to be 1.5 percent; the discount rate is assumed to be 5 percent.

Table 3 decomposed the generational imbalance into two factors: demographic change and fiscal debt position. Even if we assume no debt outstanding (zero debt) in 1995, there remain generational imbalances of 155 percent for case A and 309 percent for case B. Hence, current

debt outstanding per se is not the main reason for the generational imbalance. On the other hand, if we assume no demographic change after 1995, the generational imbalance is substantially reduced to 42 percent for case A and 77 percent for case B. This implies that Japan's generational imbalance is largely due to the aging of the demographic structure and intergenerational transfers via fiscal policy.

## 4.6 Time to Rethink Sovereign Bankruptcy[7]

This section is concerned with the issue of how to balance bailouts (or 'lending into arrears') with debt reductions (or 'private sector involvement') in the resolution of sovereign debt crises. It begins by briefly outlining the core underlying economic and legal problems sovereigns and creditors face in a sovereign debt crisis. It continues with a review of recent proposals to facilitate or regulate sovereign debt renegotiations, in particular the proposal for a statutory approach to sovereign debt restructuring. We do not aim to assess the political feasibility of the proposed institutions for the resolution of sovereign debt crises. Instead, we focus on their likely effectiveness. In addition to defending a sovereign bankruptcy framework we have developed in recent work, we propose a major reorientation of the IMF's role in sovereign debt crises.

### The Economics and Law of Sovereign Debt Restructuring

A bankruptcy-style restructuring framework can only be justified if proponents can point to serious flaws in the existing approach to sovereign debt finance and restructuring. As a first step toward making that case, we begin by briefly exploring the economics and law of the current strategies for restructuring sovereign debt. In the first section, we describe and critique the argument that existing impediments to restructuring are actually beneficial, rather than problematic. We then consider several contract and market breakdowns that are not adequately addressed by the existing approaches to sovereign debt crises[8].

*The willingness to pay problem*

The most dramatic development in private sovereign debt markets over the 1990s and 2000s has been the emergence of widely held bonds as the debt instrument of choice in sovereign debt

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7 This section draws heavily from Bolto and Skeel (2010).

8 For a useful, succinct summary of many of the concerns discussed in this section, with a particular emphasis on the realities of decision making by international institutions, see Tarullo (2004).

finance. While bank loans were the dominant source of external finance throughout the 1980s, they were eclipsed by bonds in the early 1990s, and sovereign debtors now borrow three times as much through bonds as from banks. Because the bonds are held by thousands of different investors, this shift has significantly complicated the process of restructuring the sovereign's debt in the event of a subsequent sovereign debt crisis.

Given that sovereign debt already is difficult to restructure, it is not immediately clear why sovereigns have been so willing to issue debt that magnifies these difficulties. Several commentators have argued that sovereigns have gravitated toward hard-to-restructure financial instruments in order to solve the well-known willingness-to-pay problem[9]. A sovereign's creditors cannot easily collect what they are owed in the event the sovereign is unwilling or unable to pay. They cannot attach local assets, for instance, and most sovereigns have only limited assets outside their borders. Knowing that the deck is stacked against their creditors, the argument goes, sovereign debtors may ask creditors for concessions at the first sign of trouble. Financial instruments that make renegotiation more difficult counteract this problem by making it harder for sovereigns to renege. Sovereigns that protect their creditors in this fashion will be rewarded with lower interest rates and more attractive credit terms.

The suggestion that high *ex post* renegotiation costs can impose valuable discipline on a borrower by discouraging opportunistic renegotiation is well taken. But this insight assumes that sovereign borrowers will choose a level of debt that optimally balances the sovereigns' *ex ante* borrowing costs with their *ex post* costs of financial distress[10]. In reality, sovereign debtors have built-in incentives to commit themselves to excessively high restructuring costs, rather than optimal ones. Political leaders often are more concerned about short-term issues – e.g., how much they can borrow – than long-term ramifications such as the potential consequences of default, since the current administration will usually be gone by the time any repayment difficulties arise. Somewhat similarly, current leaders may borrow to further their own goals even if the effect is to impose inordinate restructuring costs on the country as a whole. Finally, the fact that excessive restructuring costs increase the likelihood of a bailout in the event of financial distress may give the parties another reason to gravitate toward debt that is too difficult to restructure[11]. In short, there is reason to believe that obstacles to restructuring may be more a danger of the increased use of difficult-to restructure debt, than a benefit.

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[9] The leading advocate of hard-to-restructure debt as a solution to the willingness-to-pay problem has been Michael Dooley. See, e.g., Dooley (2000).

[10] The critique in this paragraph draws from Bolton and Skeel (2004) p.771.

[11] Yet another reason sovereigns may over borrow is for signaling and reputation purposes, as discussed in section on Signaling and Reputation Building.

**Confidence and Liquidity Crises**

Along with the willingness-to-pay problem, another major concern with sovereign debt is that sovereigns may be prone to confidence and liquidity crises. Just as perfectly solvent banks may be exposed to sudden panic runs by their depositors, reasonably prudent and financially orthodox sovereigns face the risk of a self-fulfilling debt crisis. The panic may be provoked by a contagious failure of another sovereign, as in the Asia Crisis of 1997[12]. Or it may result from skepticism by a subgroup of lenders about the solvency of the sovereign, generally due to a worsening in the country's fundamentals[13]. Even if the sovereign is perfectly solvent it only takes so many skeptical lenders to trigger a run on the country.

These self-fulfilling crises obviously can impose huge costs on a sovereign. IMF bailouts are generally rationalized as an efficient intervention in sovereign debt markets to preempt such crises, and when that fails, to soften their impact by stepping in as an ILOLR (International Lender of Last Resort). The successful resolution of the Mexican debt crisis of 1994-5, thanks to a massive bailout, is often touted as a perfect example of the IMF's role in stabilizing international financial markets[14]. Indeed, its advocates have argued against a move away from large IMF programs towards more private sector involvement on the grounds that private sector participation would undermine the IMF's ability to respond effectively to self-fulfilling panics. Their concerns are well taken if the crisis under consideration is an isolated self-fulfilling liquidity crisis. But they become less pertinent if one is confronted with a potential solvency crisis[15], or if one looks at the future consequences of an accumulating stock of debt, which is increasingly difficult to service by a financially strapped sovereign. Alas, when a sovereign approaches financial distress there may come a point when the only reasonable solution is to forgive or reschedule some of the debt. Private sector involvement therefore can never entirely be ruled out. As a practical matter, the fundamental policy question for sovereign debt is not whether to involve the private sector, but how to combine bailouts and moratoria. When should the IMF rely primarily on bailouts and when should it involve the private sector?

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12 For in-depth discussion of the Asian crisis, see Blustein (2001); Stiglitz (2003); Rieffel (2003) pp.203-8.

13 Since the publication of Morris and Shin's pathbreaking article (1998), it is widely accepted that currency and debt crises are due to a combination of deteriorating fundamentals and partially self-confirming speculator beliefs about an impending crisis. In more recent work, Haldane et al. (2003) have shown haw the incidence of such crises may be reduced when sovereign debt restructuring is facilitated.

14 See, e.g., Rieffel (2003) pp.198-202.

15 In a pure liquidity crisis, the sovereign has sufficient assets to repay its obligations but is roiled by a self-fulfilling run on its currency. In a solvency crisis, by contrast, the sovereign has more debt than it can realistically repay. As the analysis of Morris and Shin (1998) emphasizes, it is often impossible to clearly distinguish a solvency from a liquidity crisis in practice, as liquidity crises tend to be precipitated by concerns about a sovereign's solvency.

*Collective action failures*

If sovereign debt instruments are widely dispersed, several collective action problems may arise when attempting to renegotiate them. A first obvious problem is *communication*: how to make sure that all creditors are informed about a restructuring proposal. Assuming that everyone has been informed, the second problem is that there are strong incentives for individual creditors to stay out of the restructuring and free ride on the debt forgiveness of others. This is the notorious holdout problem, which takes its most extreme form when individual creditors not only decide to sit out restructuring negotiations, but also attempt to collect debt repayments for themselves through private litigation. When the IMF decided to change its policy orientation, calling for greater private sector involvement as recommended by the Rey Report[16], there was a natural concern that collective action problems might thwart any attempt at restructuring the widely dispersed debt of the private sector.

Although the early successes in restructuring the debts of Ecuador, Uruguay, Pakistan, and the Ukraine allayed the worst fears about the difficulties in getting the private sector involved, concerns remained about larger sovereign debtors with more complex debt structures, such as Argentina. At the same time, the stunning success of vulture fund Elliott Associates in securing payment from Peru through private litigation in September 2000 raised considerable uncertainty about the extent of future holdout problems[17]. It is these concerns that led to proposals by several countries in the Group of 7 to provide for debt standstills to facilitate debt-restructuring negotiations and to the call by Anne Krueger of the IMF for the introduction of a statutory debt-restructuring procedure for sovereigns: the SDRM.

*Signaling and reputation building*

An important step towards the implementation of an SDRM was to be the modification of the IMF Articles of Agreement. In particular, the IMF's plan contemplated mandatory adoption of an SDRM by all members of the Fund, provided that the required supermajority of countries agreed to adopt it. The IMF proposed this politically risky and time-consuming strategy for implementation because IMF officials feared that most countries would simply not choose to adopt the SDRM on a voluntary basis unless they were sure that all others would also adopt it. The thinking was that an individual country if given the option would choose to stay out as a way of signaling its creditworthiness.

Similarly, other commentators have argued that sovereign debtors may choose to structure their debts to make them very costly to renegotiate, as a way of building a reputation for

[16] Group of Ten (1996) (known as the Rey Report after Jean-Jacques Rey, a Belgian Central Bank deputy and chair of the working group that produced the report).

[17] The Elliott litigation is discussed in section on Appraising Argentina's Debt Restructuing Challenges.

creditworthiness[18]. Only a debtor that expects to be able to repay its debts, according to this theory, would be prepared to incur huge restructuring costs. This logic suggests the structure of many sovereigns' debt is likely to be inefficient and excessively difficult to restructure, thus justifying *ex post* policy interventions that facilitate debt renegotiations and lower the costs of debt restructuring.

*Over-borrowing and debt dilution*

Just as signaling and reputation building can lead sovereigns to accept to bear excessively high debt-restructuring costs, the lack of seniority protection and debt dilution concerns can also give rise to debt structures that are too costly to restructure.

Creditors may adjust to the inability to establish enforceable priorities by insisting on priority substitutes such as an excessively rapid repayment schedule, for instance[19]. Again, these inefficiencies can be alleviated through a sovereign debt-restructuring mechanism that is designed to legally enforce seniority and thus protect lenders against the risk of over-borrowing and debt dilution, as we have argued in earlier work.

*Bailouts, private sector involvement, and moral hazard in lending*

Throughout the 1990s, sovereigns and their creditors relied on the IMF's willingness to 'lend into arrears' if necessary – that is, to spearhead a bailout – as the principal response to sovereign debt crises. As discussed above, the IMF is not well suited to serve as an ILOLR, and bailouts are a better response to liquidity issues than to insolvency concerns[20]. In practice, bailouts also create a serious risk of creditor moral hazard. If creditors know (or believe) they can count on the IMF to pick up the pieces if a sovereign defaults, they will be much more careless in their lending than would otherwise be the case.

Mindful of these problems, the IMF sought to involve the private sector under a 'bailin' strategy[21]. Rather than permitting private creditors to free ride on an IMF credit facility (i.e., a bailout), the IMF made creditor concessions a precondition of its willingness to lend (the bailin). The IMF announced that it will only agree to coordinate a bailout if the private creditors agree to restructure the sovereign's obligations.

Although this strategy is promising in some respects, such as its recognition of the need for private sector participation, it has several serious – indeed, potentially fatal – limitations. First, the strategy requires a significant reorientation of the usual sequence of responses to a

[18] See e.g., Eichengreen (2003) p.75.

[19] Bolton and Jeanne (2005) provide a formal analysis of inefficient de facto seniority achieved through debt that is difficult to restructure.

[20] See above, section on Confidence and Liquidity Crises.

[21] The bailin strategy is described in detail in Roubini and Setser (2004) and Eichengreen and Ruehl (2000) pp.16-7.

sovereign debt crisis. In previous crises, the IMF took the lead, and private creditors relied on the IMF's assessment to shape their responses. Under a bailin, the IMF in some respects plays follower rather than leader[22]. Second, the bailin strategy doesn't address the need for a coherent seniority structure. It provides no guidance on the order in which the sovereign's debt should be restructured, for instance, which leaves open the risk that ostensible priority rankings will be ignored as in Ecuador's restructuring in 1999[23]. The final, and most important, problem is credibility. It is difficult for the IMF to credibly commit that it will not provide a bailout, particularly at times when there are concerns about contagion. Outside the few cases of very small countries that have been pressured to restructure their debt, there are few instances when the IMF decided to withhold funding, and when it did, it generally only did so following the failure of several previous programs, as with Russia in 1998 and Argentina in 2001. When creditors can reasonably expect such IMF forbearance, they will prefer to gamble on an IMF rescue, as they did in Russia and Argentina, rather than agree to make concessions to avert a debt crisis. And private creditors' intransigence only exacerbates the pressure for the IMF to step in with a bailout.

The question, then, is this: what alternative solutions are available and should be considered? It is to this question that we now turn.

**Contracts and Ad hoc Negotiation: New and Existing Strategies**

The previous section catalogued the principal economic factors bearing on sovereign debt and sovereign debt crises. In this section, we explore the innovations that have been introduced recently and the continuing experiences under the existing market-based approach. We begin with a discussion of the collective action clauses (CACs), followed by concerns about creditor seniority in restructuring. We end with a discussion of lessons that can be gleaned from the 2001-2 crisis in Argentina.

*Collective action provisions (CACs)*

By just about any yardstick, the most successful of the proposals for addressing sovereign defaults has been the call to encourage sovereigns to include collective action provisions in the bonds they issue. The bonds governed by UK law have long included voting provisions that permit a specified majority of bondholders to adjust payment or interest terms in the event of a debt crisis. Bonds governed by New York law, by contrast, have traditionally given each bondholder the right to decide whether or not to agree to a restructuring. In the 1990s, an

[22] For a discussion of the problems with this reorientation, see Eichengreen and Ruehl (2000).

[23] Ecuador subverted the ostensible priority of its collateralized Brady bonds by negotiating to restructure these bonds first, before turning to its other debt. Ibid. 16-17.

increasing number of commentators concluded that this 'unanimity' approach makes restructuring too difficult. To facilitate coordination among the sovereign's bondholders, and to counteract the threat of holdouts, they argued, sovereign debtors should include CACs in all of their bonds[24].

Perhaps the most dramatic recent development in international finance has been the stunning success of the campaign to introduce CACs into New York-*governed* sovereign debt. In early 2003, shortly before the IMF formally jettisoned its proposal for a sovereign bankruptcy regime, Mexico very publicly issued New York-registered bonds that permit changes to the payment terms with the consent of 75 percent of the holders. Within a few weeks, several other sovereigns had followed suit, including Argentina and Brazil. Since the end of 2003, nearly every new issuance of sovereign bonds has featured a CAC[25]. Nor have these innovations been limited to the existence of a voting provision alone. The bonds issued by Mexico and CACs introduced by Uruguay when it 'reprofiled' its debt disenfranchised bonds owned by the sovereign issuer and its public sector instrumentalities in order to prevent the sovereign from manipulating the voting process. Even more importantly, the Uruguayan bonds included an aggregation clause that permitted a combined vote of all the classes of bonds that include the clause. The clause was designed to obviate the need for separate votes for each class of bonds by creating the possibility of a single, interclass vote on the terms of a restructuring[26].

The new collective action clause consensus ushered in a regime that looks much like the world that many commentators had been calling for. If their vision was accurate, there would be no need for significant additional reforms. But there are several reasons to suspect that CAC enthusiasts oversold the virtues of the new clauses. First, CACs are more effective for restructuring one or a small number of classes of bonds than for sovereign debtors with a more complicated capital structure[27]. Uruguay's aggregation provision was designed to counteract this limitation by lumping several bond issuances into a single class for voting purposes. But the provision is untested; it remains to be seen whether the aggregation strategy will work. Moreover, the aggregation clause, as with CACs generally, seems more promising for restructuring a small group of similar classes of bonds than for a more complicated capital structure.

Second, although CACs counteract the collective action and holdout problems, they leave several other sovereign debt issued untouched. One of the most important shortcomings of the sovereign debt markets is the absence of an enforceable priority structure. As noted earlier,

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[24] An early, influential emphasis on CACs came in Eichengreen and Portes (1995) p.49. More recently, Mitu Gulati has written extensively about the use and promise of CACs. See, e.g., Buchheitand Gulati (2002) p.1317. For a nuanced view of the choice between CACs and the unanimity approach, see Bratton and Gulati (2004) p.57.

[25] These developments are recounted and analyzed in Choi and Gulati (2004) p.929; (2006) p.1129.

[26] For a brief description of the Uruguay provision, see Gulati and Skeel (2003).

[27] This point is discussed in more detail in Skeel (2002) p.417.

creditors' inability to create enforceable priorities introduces serious inefficiencies, such as the risk of debt dilution. A CAC-based approach does nothing to remedy the priority problem. CACs also do not address concerns such as the need for a standstill while the sovereign debtor is renegotiating its obligations[28].

Ironically enough, given the hoopla surrounding the widespread inclusion of CACs in new York-governed bonds, it is not entirely clear that CACs will significantly affect the restructuring even of the bonds that now include them. Ecuador's 1999 restructuring showed that sovereign debt can be scaled down through the use of exit consents – that is, an exchange offer that is combined with a vote by the exiting bondholders to alter in detrimental fashion the non-payment terms of any bonds that are not exchanged in the offer[29]. Although exit consents are a strategy for restructuring bonds in the absence of CACs, they have been employed even with bonds that included a voting provision. Thus, in addition to being only a partial solution to the shortcomings of the sovereign debt markets, CACs may not even prove to be the mechanism of choice for restructuring individual classes of bonds.

*Changing and enforcing seniority*

Although most commentators have focused on collective action problems, an equally important problem is debt dilution and the lack of enforcement of seniority in sovereign debt. That is, in the absence of enforceable priorities, when a debtor country approaches financial distress any new debt it issues is partly at the expense of existing creditors who face a greater risk of default and will have to accept a greater 'haircut' (or debt reduction) in the event of default, since the total resources the debtor can muster towards repayment of its stock of debt will have to be divided pro rata among all its creditors, old and new. In earlier work, we have argued that the lack of enforcement of an absolute priority rule encourages over-borrowing by the sovereign as it approaches financial distress and also raises its overall cost of borrowing[30].

The shift in IMF policy towards greater private sector involvement, which was first signaled by the IMF during the Russian debt crisis of 1998 when it abandoned its bailout effort, magnified the uncertainty by upsetting market expectations concerning implicit seniority. Two subsequent events boiled the waters still further: the debt restructuring of Pakistan in 1999-2000, and the decision by the Court of Appeals of Brussels in 2000 to grant Elliott Associates, a venture fund that had invested in Peruvian debt, a restraining order against

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28 These and additional shortcomings are discussed in Bolton and Skeel (2004) pp.773-6.

29 The exit consent strategy was described in Buchheit and Gulati (2000) p.59. Buchheit served as counsel for Ecuador in the restructuring shortly after the article was initially drafted.

30 Bolton and Skeel (2004) pp.791-3. Bolton and Jeanne (2005) provide a formal analysis of optimal debt structure in the absence of any legal enforcement of seniority. They show that creditors attempt to achieve higher priority de facto by making their debt difficult to restructure. Overall this results in an excessively high cost of financial distress.

Euroclear preventing it from accepting transfers from the Peruvian government towards paying other creditors before Elliott's debt claims on Peru had been honored[31].

The first event, Pakistan's debt-restructuring agreement of 2000, required for the first time that Eurobond holders be included in the restructuring agreement, thus shattering the market's perception that these debts had higher priority status[32]. The second event, *Elliott Associates* v. *Peru*, alerted the market to the potentially far-reaching possibilities that the traditional interpretation of the standard *pari passu* clause in sovereign bond issues might no longer be valid[33], and that private litigants could threaten to disrupt the transfer of funds from sovereigns to creditors by obtaining restraining orders in court.

The new uncertainty as to which types of sovereign debt will or won't be subject to restructuring, and as to the meaning of the ubiquitous *pari passu* clause, propelled the issue of priority and debt seniority to the forefront of discussions about sovereign finance. Before examining how debt seniority can best be enforced, we begin by describing the Elliott decision and the legal debate surrounding it in more detail.

Elliott Associates, playing an aggressive holdout strategy, refused to go along with Peru's proposed Brady Plan debt restructuring of 1995. Instead, it attempted to obtain repayment on its debt by initiating a series of lawsuits and eventually prevailed in the Court of Appeals of Brussels in September 2000. Eager to avoid a default on its Brady bonds, the Peruvian government decided to settle following the Court's decision by paying Elliott in full[34].

Underlying the Brussels Court's decision was a seemingly straightforward interpretation of the *pari passu* clause. The clause states that '[t]he obligations of the Guarantor hereunder [the Peruvian Government] do rank and will rank at least *pari passu* in priority of payment with all other External Indebtedness of the Guarantor, and interest thereon'[35]. The court interpreted this language as meaning that when the debtor is unable to repay all its debts in full, all claims of equal ranking under the *pari passu* clause should get a pro rata share of the total amount the debtor pays out. Most importantly, the Court deemed that the debtor cannot pay some creditors in full (the creditors who agreed to the restructuring) and default on others (the creditors who held out and retained their original bonds). It is on the basis of this interpretation that the Court granted Elliott Associates a restraining order against Euroclear, the entity to which Peru had wired funds to pay consenting bondholders the scaled-down amounts they had agreed to accept[36].

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31 *Elliott Assocs. LP v. Banco de la Nacion*, 194 F.3d 363, 366 (2d Cir. 1999).

32 See Zettelmeyer (2003), Gelpern (2004b) p.1115.

33 The competing interpretations of the *pari passu* clause are described below. See below, nn. 36-8 and accompanying text.

34 Gulati and Klee (2001) p.635.

35 *See Elliott Assocs. LP v. Banco de la Nacion*, 2000 US Dist. LEXIS 14169 (SDNY Sept. 29, 2000) and *Elliott Assocs. LP v. Republic of Peru*, 2000 US Dist. LEXIS 368 (SDNY Jan. 18, 2000).

36 In effect, Elliott claimed that it was entitled both to claim its share of the payments being made to consenting

The Court's interpretation provoked a torrent of criticism[37]. Most commentators favor an alternative interpretation of the *pari passu* clause, that it is designed to prevent the borrower from issuing new debt that is senior to the existing debt. Which interpretation the courts will end up adopting in the future is still uncertain, although in light of the outpouring of academic writing and briefs following the Brussels Court of Appeals decision, the narrower interpretation favored by legal scholars seems likely to prevail.

Lost in the hand-writing over the novel interpretation of the boilerplate *pari passu* clause by the Brussels Court of Appeals is the possibility that the Court's remedy could open up a new strategy for the enforcement of sovereign debt payments, with far-reaching consequences that no one had conceived of before. Crucial to this possibility is the fact that the Court granted a restraining order against Euroclear, rather than limiting itself to a judgment against Peru.

To appreciate the implications, start with Gulati and Klee's ominous warning that:

> What the Brussels decision does is to put a large hammer in the hands of holdout creditors, thereby enabling them to cause even more disruption in restructurings. Those inclined to be holdouts have a stronger position, and it encourages other to hold out. For the sovereigns and, we argue, for the majority of creditors, this is a nightmarish situation[38].

The restraining order does indeed amount to a big stick for creditors, which plausibly should not be put in the hands of holdout creditors. Interesting new possibilities, however, can be imagined if one thinks of this stick as potentially applying to the enforcement of debt payments and seniority more generally. If creditors' inability to seize assets and a sovereign's limited capacity to issue collateralized debt interfere with a sovereign's ability to borrow, then an effective way of relaxing the sovereign's borrowing constraint may be to give creditors the means to credibly threaten to shut out a defaulting sovereign from international financial markets by preventing it from paying off new creditors.

The greater enforcement powers opened up by Elliott-type injunctions have inspired several commentators to outline the contours of a contractual approach to the enforcement of seniority in sovereign debt. One suggestion, put forward by both Zettelmeyer and Gelpern, is for senior creditors to enforce the priority ostensibly granted to them by a sovereign debtor vis-à-vis other, junior creditors pursuant to a 'third party beneficiary' theory. Junior creditors would agree to subordinate their claims, and courts might agree to enforce the subordination, based on the theory that the junior creditors could be construed as beneficiaries of the financing from the

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bondholders, and (unlike the consenters) to continue to insist on payment of the full face amount of its bonds.

37 For critiques of the Elliott ruling, see, e.g., Gulati and Klee (2001), Buchheit and Pam (2004) p.869. For a somewhat more sympathetic interpretation, see Bratton (2004) p.823.

38 Gulati and Klee (2001) p.638.

senior creditor[39]. Another suggestion, first offered by Wood, is to contractually require the sovereign to include senior creditors as parties in subsequent junior debt issues[40]. If sovereign debtors began to include these kinds of subordination arrangements in their debt contracts, one could conceive of Elliot-type injunctions that courts might grant to senior creditors against a sovereign that later attempted to violate the terms of the earlier agreement. If a sovereign debtor that had agreed to subordinate any subsequent debt failed to do so, a creditor could ask a court to enjoin the new issuance.

While such remedies might conceivably discipline sovereigns and open the way for the contractual enforcement of an absolute priority rule for sovereign debt, the critical issue remains whether the cure is not likely to be worse than the disease. There is a real potential for nightmarish disruptions to the payment system, and one could imagine a multiplication of costly legal actions between creditors. In addition, this strategy would impose a continuous monitoring burden on the senior creditors. Because any subordination clause included in a creditor's contract with the borrower could not bind a subsequent third party borrower who might be ignorant about the priority arrangement, the senior creditor would be forced to police to make sure that the sovereign included a subordination provision in each subsequent debt issuance[41].

We do not mean to discourage these contractual innovations. We believe that they represent an important step forward in the effort to improve sovereign debt markets. But it is important to recognize that the contractual approach also brings important risks.

**Structured Negotiation and Sovereign Bankruptcy Proposals**

In contrast with the emphasis on changing the contractual rights and obligations of debtors and creditors, IMF proposed a new initiative in international law, the sovereign debt-restructuring mechanism (SDRM). While it did not win enough political support for implementation, it was seriously developed and considered by governments. Other proposals for formal bankruptcy-type mechanisms and informal processes of mediation as well as arbitration have been made to facilitate debt decision making. Given how important it was, we first focus on the SDRM and then discus a number of the other proposals.

39 Zettelmeyer (2003), Gelpern (2004b).

40 Wood (1990).

41 If the priority arrangement were somehow deemed to be binding on a subsequent creditor, the higher 'due diligence' burden would fall on new lenders, who would need to determine what the stock of outstanding senior debts was before making a loan. Short of setting up a central register of senior debt that could be easily accessed by new lenders this would often be an impossible task.

*The IMF's sovereign debt-restructuring mechanism (SDRM)*

In late 2001, the IMF stunned the international financial community by calling for a sovereign bankruptcy procedure. The IMF's sovereign bankruptcy initiative was first announced in a November 2001 speech by Anne Krueger. The IMF staff subsequently produced a series of detailed draft proposals outlining the SDRM in 2002 and early 2003. Because the IMF's proposal has been the lightning rod for recent debate over sovereign bankruptcy, we will explore it in some detail before briefly considering several alternatives and then describing the approach we advocate[42].

The guiding concern of the IMF's proposal was to resolve collective action problems among dispersed creditors in debt-restructuring negotiations, while preserving creditor contractual rights as much as possible[43]. Viewed from this perspective, the key element in the IMF's proposed mechanism was a majority vote among creditors on a restructuring plan, which would bind a dissenting minority[44]. With the aim of preserving creditor rights as much as possible, the IMF's plan generally did not envisage a stay on litigation and individual debt collection efforts or a standstill on debt payments[45]. The main stated justification for not introducing an automatic stay into an SDRM was that it was unnecessary, as sovereign assets are much harder to collect than corporate assets. Lengthy and uncertain litigation might be required, and even if the plaintiff prevailed it was likely that a restructuring agreement would already have been approved in the meantime, which could limit the plaintiff's gain.

The main limitation on plaintiffs' gains that the IMF envisioned mirrors a legal rule in international insolvency law: the *Hotchpot rule*. This rule requires that any payment or asset collected by a plaintiff through litigation must be offset against the plaintiff's claim in the restructuring agreement[46]. That is, any new claim the plaintiff would be entitled to in the restructuring agreement would be reduced by an amount equal to what the creditor obtained through legal action. Should the plaintiff obtain more than what the restructuring agreement specifies then the Hotchpot rule could be supplemented with a *clawback* provision. The IMF's proposed plan did not allow for such a provision on the grounds that it would be impractical[47].

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42 Miller and Thomas (2006) argue that the US federal judge who handled much for the litigation cleverly orchestrated the process that led to Argentina's eventual exchange through his sequence of decisions, several of which are described in the text. In our view, Miller and Thomas overstate the extent to which larger objectives motivated the court's decisions. But we agree that the judge was sensitive to the dangers of interfering with Argentina's negotiations with its creditors.

43 *Dow Jones* (2004).

44 See, e.g., Alfaro (2006) in which Alfaro notes that the exchange had 'a 76% participation rate, under the usual rate of above 90% in other restructurings worldwide'.

45 See, e.g., Thompson (2005).

46 According to *Dow Jones Newswire*, the Argentine government eventually decided to abandon initial plans to include 'exit consent' clauses in Argentina's debt swap offer as a way of avoiding potential future litigation and securing approval of the plan with some countries' financial regulators. (*Dow Jones Newswire*, Nov.5, 2004).

47 In advocating sovereign bankruptcy, the IMF seems to have taken its cue from a statement made by Treasury Secretary O'Neill in congressional testimony.

The Hotchpot rule clearly reduces incentives for private litigation, but it does not eliminate them. Also, it does not directly address the concern that private litigation may be undertaken mainly as a negotiation or delaying tactic, for example by undermining the sovereign's ability to trade. The IMF's proposed plan recognized this issue and proposed that the judge (see below) could have authority to stay specific legal actions on request of the debtor and subject to approval of creditors.

The voting provision and the Hotchpot rule were the centerpieces of the IMF's proposed plan. The plan also contained many more technical provisions dealing with notification of creditors, registration, and verification of claims[48]. As in corporate bankruptcy this can be a lengthy and difficult process. An important additional complication is that the ultimate ownership of a sovereign bond is hard to trace. The court must be able to pierce through the veil of beneficial ownership to be able to ascertain whether the votes on a particular bond are controlled by the sovereign. Should that be the case then these votes should be ineligible for obvious conflict of interest reasons[49]. A related difficulty is that for widely dispersed debt structures many claims may not be registered in time. Given the large number of claims that won't qualify, a requirement that a supermajority of 'registered' claims approve the plan may function more like a simple majority requirement in practice, thus resulting in a weaker protection of creditors. These difficulties underscore the need for a court-supervised restructuring procedure as well as the important benefits that might be available with the establishment of an international clearing house.

As the main focus of the IMF's proposed plan was on the resolution of collective action problems among sovereign bondholders, the mechanism was under-inclusive and incomplete on the two other major facets of a restructuring procedure, the provision of priority financing and the enforcement of absolute priority. The plan's only means of enforcing absolute priority was through the exclusion of several classes of debt from the SDRM. Thus, the plan proposed to exclude privileged claims, obligations to international organizations such as the IMF ('multilaterals'), and debt owed to other nations (the 'Paris Club'). A first difficulty with this approach was that it implicitly accorded a higher priority to Paris Club debt as a *fait accompli* and singled out by default private investors as the main target for debt reduction. This difficulty was compounded by the discretion given to the debtor under the plan to include or exclude debt claims – such as trade credit, claims on the Central Bank, etc. – from the SDRM[50]. Again, this discretion gave the debtor considerable power to undermine a given priority

[48] Much of the description and analysis in this section is drawn from Bolton and Skeel (2004) pp.776-80. The IMF's first detailed proposal was IMF, 2002. This proposal was subsequently adjusted as IMF, 2003a.

[49] IMF (2002) 7, suggesting that the SDRM provisions should resolve 'a critical collective action problem' but do so 'in a manner that minimizes interference with contractual rights and obligations'.

[50] Ibid. 10, calling for voting threshold of 75% of registered and verified claims.

structure and to cut side deals with particular creditor classes in exchange for exclusion of their claims from the formal SDRM proceedings.

The plan recognized some of these difficulties and proposed as an alternative to include Paris Club debt in the SDRM under a separate class[51]. The plan also allows for other forms of classification and gives the debtor discretion to classify under the general requirement that classification does not result in 'unjustified discrimination of creditor groups'[52]. While classification brings about greater flexibility it is important to understand that it does not guarantee in any way enforcement of absolute priority. To the contrary, the IMF's plan might well have facilitated deviations from absolute priority by giving a veto power, unconstrained by a cramdown or best interest rule, to a junior creditor class.

Just as the IMF's plan does not systematically address the issue of enforcing absolute priority it also only gives lip service to the issue of debtor-in-possession (DIP) financing. Again, with the objective of preserving creditor contractual rights as much as possible, the IMF's proposed plan only allowed for 'priority financing' if it was approved by '75 percent of outstanding principal of registered claims'[53]. The main purpose of DIP financing is to address an immediate cash crisis and allow the debtor to function while the restructuring negotiations are ongoing. Clearly, a creditor vote would be extremely difficult to organize in a timely fashion, making it virtually impossible to organize any such financing.

The last key component of the IMF's plan was its proposal to set up an independent *Sovereign Debt Dispute Resolution Forum* (SDDRF) to oversee the sovereign bankruptcy process[54]. The selection of judges to be appointed to the SDDRF would be delegated to a *selection panel* designated by the IMF's Managing Director and charged with the task of making up a shortlist of candidate judges that might be impaneled when a debt crisis arises. The final shortlist would be subject to approval of the IMF's governing board. The president of the SDDRF would be charged with the selection of the final group of four judges to be impaneled in the event of a crisis. While the plan goes to considerable lengths to guarantee the independence of the SDDRF, and to limit the SDDRF's role, it is still worth noting that this procedure was not a foolproof method to guarantee the full independence of the court.

Overall, the IMF plan was an extremely important development in our thinking about how best to address sovereign debt crises. As this brief overview makes clear, however, it also had serious limitations. Most importantly, the IMF plan focused extensively on the *ex post* issue

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51 Ibid. 9-10, concluding that there should be 'no generalized stay on enforcement' but leaving open the possibility of a creditor vote to impose a stay on a specified action. The IMF's subsequent proposals contemplated a stay in some, limited circumstances. See, e.g., IMF (2003a) pp.11-2, stay if bond creditors committee and SDRM decision-maker approve.

52 IMF (2002) pp.35-7, explaining and adopting the Hotchpot rule used for corporate debtors in some jurisdictions.

53 Ibid. 37.

54 Ibid. 8-9, summarizing provisions for determining 'eligble claims'.

of solving creditors' collective action problems, but it paid much less attention to the equally important issue of the *ex ante* effects of an SDRM – in particular, the need to honor creditors' repayment priorities in order to facilitate sovereign credit markets. In addition, the IMF's proposal for interim financing was cumbersome and did not fully address the growing concerns about the nature of the IMF's funding and oversight role. Finally, the creation of an SDDRF by the IMF itself raised independence and conflict of interest concerns.

*Other sovereign bankruptcy proposals*

Although the IMF's sovereign bankruptcy proposal received a great deal of attention, it was far from the first effort to introduce bankruptcy principles into sovereign finance. Starting with Christopher Oeschsli in the early 1980s, a series of commentators have developed proposals for a sovereign bankruptcy scheme[55]. The section briefly considers four representative examples: a proposal by Jeff Sachs in 1995, followed by the schemes defended by Steven Schwarcz, the Jubilee movement, and Lerrick and Meltzer after the turn of the new century. Although the proposals differ in major respects, they share similar limitations[56].

A much discussed speech by Jeff Sachs did more than any other proposal to introduce the concept of sovereign bankruptcy into sovereign finance circles[57]. Writing in the immediate aftermath of the Mexican liquidity crisis, Sachs called for a sovereign bankruptcy regime that would include a standstill on creditors' collection efforts and provision for interim financing based on the special priority provided in US chapter 11 for financing corporate reorganizations. Sachs's proposal was not designed to offer a fully developed sovereign bankruptcy regime. An important limitation of the proposal, particularly as viewed through the lens of subsequent developments, is that it did not provide any criteria for when interim financing should be allowed and how the amounts might be limited. As we have seen, these are increasingly critical issues given the constraints on the IMF's funding. The proposal also did not provide any mechanism for inducing the parties to reach agreement in the event their negotiations broke down – no proxy for the role that the threat of liquidation and cramdown play in chapter 11.

Five years after Sachs, Steve Schwarcz outlined a more elaborate sovereign bankruptcy regime[58]. Like Sachs, Schwarcz advocated priority for interim financing, but he differed from

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55 The problem of sovereign control of key claims, and through these claims, of a vote by creditors, figured prominently in a sovereign debt dispute involving Brazil in the 1990s. Through Banco do Brasil, which had participated in a syndicated loan agreement, Brazil managed to thwart an effort by other holders of the debt to accelerate the amounts due under the loan. *CIBC Bank and Trust Company* v. *Banco Central do Brasil*, 886 F. Supp. 1105 (SDNY 1995), refusing to intervene to impose implied obligations of good faith and fair dealing. For discussion and criticism, see Bratton and Gulati (2004).

56 IMF (2002) 13. 'A debtor may decide to exclude certain types of claims from a restructuring, particularly where such exclusion is needed to limit the extent of economic and financial dislocation.'

57 Ibid. 24-5. Because the Paris Club resisted any inclusion in the SDRM, the IMF ultimately left open the possibility that the Paris Club would be excluded altogether.

58 Ibid. 53.

Sachs in his view that it was unnecessary to impose a standhill in the sovereign context[59]. Schwarcz concluded that only the sovereign debtor should be permitted to initiate the proceeding, and he explicitly rejected the use of a cramdown procedure. For present purposes, the most important flaws in Schwarcz's proposal, as with Sachs's, were the absence of any principle for defining when interim financing should be permitted and the absence of a mechanism to induce agreement.

A third proposal, introduced by Adam Lerrick and Allan Meltzer, was based on the view that sovereign debt crises very frequently are caused by runs on the sovereign's currency and securities[60]. Like Sachs, their proposal emphasized the need for a standstill and for fresh interim financing during the debt crisis. In Lerrick and Meltzer's proposed regime, the IMF would provide new funding in unlimited amounts in order to stabilize the price o the sovereign's debt in secondary markets. Even if Lerrick and Meltzer were correct to focus on liquidity concerns, their proposal founders on its assumption that the IMF has the capacity to provide unlimited funding in the event of a sovereign debt crisis.

The final sovereign bankruptcy proposal came from a very different source. Since the late 1990s, the Jubilee movement, which was inspired by religious leaders and churches, has campaigned for debt relief and aid to developing countries. To resolve sovereign debt crises, Jubilee called for a 'fair and transparent arbitration process' that was explicitly based on chapter 9 of the US bankruptcy laws, the chapter that covers municipal bankruptcy[61]. The five key elements of the Jubilee proposal are: a neutral decision-making body; a comprehensive procedure that includes all claims; the right of all stakeholders to be heard; an emphasis on protecting the social needs of the sovereign's citizens; and imposition of a standstill. While the Jubilee proposal introduced important considerations that are often neglected in sovereign debt discourse, it had many of the same limitations as the other proposals. Once again, there was no stick – no effective proxy for cramdown – to put pressure on the parties to reach agreement[62]. The Jubilee proposal also did not address the appropriate role and limitations of the IMF nor the need for consistent, enforceable priorities in sovereign debt markets.

*Mediation approaches*

A related strategy that has generated interest in some circles is reliance on structured mediation[63]. Perhaps the most fully developed of these proposals was Richard Gitlin's call for

59 Ibid. 10.
60 The parameters of the SDDRF are outlined ibid. 56-70.
61 Oeschsli (1981) p.305.
62 Nearly all of the sovereign bankruptcy proposals made as of 2001 are surveyed in Rogoff and Zettelmeyer (2002) 470.
63 Sachs (1995).

a dispute resolution forum that would include a registry of creditors' claims[64]. Under Gitlin's approach, the creditors whose claims were recognized would participate in a global mediation process designed to reach agreement on the terms of a restructuring. A recent proposal by Joseph Stiglitz takes this approach a step further. In Stiglitz's regime, which he refers to as an intermediate or 'soft law' approach, a mediator would oversee the sovereign debtor's negotiations with its creditors and issue a report evaluating the sovereign's proposed restructuring plan[65].

The principal virtues of mediation inhere in its intermediate status: as with CAC's, mediation could theoretically be implemented without amending the IMF's articles or relying on treaties to put the framework in place; and like a full-blown sovereign bankruptcy regime, it would take all of the sovereign's creditors into account, rather than just individual bondholders. Mediation also has several serious limitations, however. Like CACs, the existing mediation proposals do not address the need for an enforceable priority framework. In theory, this deficiency could be solved by including a priority scheme in the mediation framework, although the resulting regime would look more like sovereign bankruptcy than mediation. The other shortcoming of mediation is that it does not provide any 'stick' to induce the sovereign and its creditors to reach agreement. The sovereign debt mediator would not have the authority to impose the terms of an agreement on the parties, nor is there any other mechanism to push the parties toward a resolution. As a result, the process would simply break down if there were an impasse between the sovereign and one or more of its constituencies.

64 Schwarcz (2000) p.101.

65 We share Sach's view that sovereign bankruptcy should include at least a limited stay. Bolton and Skeel (2004) pp.780-6, suggesting that enforcement of judgments should be stayed, though litigation up to this point could go forward.

# Appendix

## Table A1 General Government Total Outlays

(Percent of nominal GDP)

| | 1987 | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 00 | 01 | 02 | 03 | 04 | 05 | 06 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 38.9 | 36.3 | 35.5 | 36.2 | 37.9 | 39.7 | 39.8 | 39.3 | 39.1 | 37.9 | 36.8 | 36.7 | 35.8 | 35.7 | 37.2 | 36.3 | 36.0 | 35.7 | 35.8 | 35.4 |
| Austria | 54.4 | 53.2 | 51.9 | 51.6 | 52.3 | 53.2 | 56.4 | 56.0 | 56.0 | 55.4 | 53.1 | 53.4 | 53.2 | 51.4 | 50.9 | 50.6 | 50.8 | 49.9 | 49.4 | 48.2 |
| Belgium | 57.0 | 55.1 | 53.4 | 53.4 | 54.4 | 54.7 | 55.7 | 53.4 | 52.9 | 53.1 | 51.4 | 50.7 | 50.0 | 49.3 | 49.3 | 50.2 | 51.0 | 49.2 | 49.5 | 57.0 |
| Canada | 46.1 | 45.4 | 45.8 | 48.8 | 52.3 | 53.3 | 52.2 | 49.7 | 48.5 | 46.6 | 44.3 | 44.4 | 42.5 | 41.1 | 41.8 | 40.9 | 40.5 | 39.4 | 38.9 | 46.1 |
| Czech Republic | … | … | … | … | … | … | … | … | 54.4 | 42.8 | 42.4 | 43.8 | 42.9 | 42.1 | 45.0 | 46.9 | 54.5 | 46.1 | 45.8 | 45.2 |
| Denmark | 55.0 | 57.2 | 57.3 | 57.0 | 57.8 | 59.0 | 61.7 | 61.6 | 60.3 | 59.8 | 58.0 | 57.6 | 56.3 | 54.9 | 55.3 | 55.8 | 56.1 | 55.6 | 54.6 | 54.1 |
| Finland | 48.5 | 47.0 | 45.1 | 48.7 | 57.6 | 62.9 | 64.1 | 62.8 | 59.5 | 59.8 | 56.4 | 52.8 | 52.1 | 49.1 | 49.1 | 50.1 | 51.0 | 50.5 | 50.6 | 50.4 |
| France | 51.9 | 51.4 | 50.4 | 50.7 | 51.5 | 53.0 | 55.3 | 55.0 | 55.1 | 55.4 | 54.9 | 53.7 | 53.5 | 52.5 | 52.5 | 53.4 | 54.5 | 54.5 | 54.4 | 53.9 |
| Germany | 45.8 | 45.3 | 44.0 | 44.5 | 47.1 | 48.1 | 49.3 | 49.0 | 49.4 | 50.3 | 49.3 | 48.8 | 48.7 | 45.7 | 48.3 | 48.7 | 48.8 | 47.8 | 47.2 | 46.1 |
| Greece | 45.1 | 44.0 | 45.4 | 50.2 | 46.7 | 49.4 | 52.0 | 49.9 | 51.0 | 49.2 | 47.8 | 47.8 | 47.6 | 52.1 | 50.2 | 49.1 | 48.3 | 49.8 | 48.4 | 48.1 |
| Hungary | … | … | … | … | 56.7 | 60.3 | 59.8 | 63.4 | 56.9 | 53.9 | 51.8 | 52.5 | 50.2 | 47.8 | 49.0 | 52.6 | 49.7 | 51.3 | 50.7 | 50.0 |
| Iceland | 37.4 | 42.5 | 45.0 | 42.4 | 43.7 | 44.6 | 44.5 | 44.3 | 43.7 | 43.2 | 41.6 | 42.4 | 43.5 | 43.1 | 44.1 | 45.8 | 48.0 | 45.9 | 44.5 | 43.6 |
| Ireland | 52.0 | 48.5 | 42.1 | 43.2 | 44.8 | 45.3 | 45.1 | 44.3 | 41.5 | 39.6 | 37.1 | 34.9 | 34.5 | 32.0 | 33.5 | 33.8 | 34.3 | 33.9 | 34.0 | 34.3 |
| Italy | 50.8 | 51.5 | 52.8 | 54.4 | 55.5 | 56.7 | 57.7 | 54.5 | 53.4 | 53.2 | 51.1 | 49.9 | 48.9 | 46.9 | 48.7 | 48.0 | 48.9 | 48.7 | 48.3 | 48.7 |
| Japan | 31.5 | 30.9 | 30.2 | 31.7 | 31.5 | 32.5 | 34.2 | 34.8 | 35.8 | 36.3 | 35.1 | 36.1 | 37.7 | 38.2 | 37.7 | 38.1 | 37.6 | 36.7 | 37.2 | 37.5 |
| Korea | 17.7 | 17.9 | 19.0 | 19.5 | 20.6 | 21.8 | 21.4 | 20.9 | 20.8 | 21.8 | 22.4 | 24.7 | 23.9 | 23.8 | 25.0 | 24.8 | 27.3 | 27.9 | 28.2 | 28.3 |
| Luxembourg | … | … | … | 43.2 | 44.4 | 46.0 | 45.7 | 44.5 | 45.5 | 45.6 | 43.3 | 42.0 | 41.2 | 38.7 | 38.8 | 43.1 | 44.9 | 45.3 | 45.6 | 45.6 |
| Netherlands | 58.4 | 56.6 | 54.5 | 54.8 | 54.8 | 55.8 | 56.0 | 53.6 | 51.4 | 49.6 | 48.2 | 47.2 | 46.9 | 45.3 | 46.7 | 47.8 | 49.0 | 48.9 | 48.6 | 47.8 |
| New Zealand | 53.6 | 52.7 | 51.9 | 53.3 | 51.5 | 49.5 | 46.0 | 43.0 | 41.9 | 41.0 | 41.7 | 42.7 | 41.0 | 39.8 | 38.6 | 38.5 | 38.3 | 38.2 | 38.7 | 39.1 |
| Norway | 50.5 | 52.6 | 52.2 | 54.0 | 54.9 | 56.2 | 55.1 | 54.1 | 51.5 | 49.0 | 47.2 | 49.6 | 48.1 | 42.7 | 44.3 | 47.4 | 48.7 | 46.7 | 45.1 | 45.3 |
| Poland | … | … | … | … | … | … | … | … | 51.3 | 51.2 | 50.2 | 48.5 | 48.1 | 44.9 | 47.6 | 48.9 | 48.2 | 47.7 | 46.6 | 45.1 |
| Portugal | 40.0 | 38.5 | 38.8 | 42.1 | 45.1 | 46.2 | 47.8 | 46.0 | 45.0 | 45.8 | 44.8 | 44.1 | 45.3 | 45.2 | 46.3 | 45.9 | 47.7 | 48.0 | 47.3 | 47.3 |
| Slovak Republic | … | … | … | … | … | … | … | 57.8 | 54.1 | 61.5 | 65.0 | 60.8 | 56.9 | 59.9 | 51.5 | 51.0 | 39.4 | 39.2 | 39.0 | 38.1 |
| Spain | 41.0 | 40.9 | 42.2 | 43.4 | 44.9 | 45.9 | 49.4 | 47.3 | 45.0 | 43.7 | 41.8 | 41.4 | 40.2 | 40.0 | 39.6 | 39.9 | 39.6 | 41.0 | 40.2 | 40.1 |
| Sweden | 62.3 | 62.5 | 62.4 | 63.5 | 65.5 | 70.2 | 72.9 | 70.9 | 67.6 | 65.2 | 62.9 | 60.7 | 60.3 | 57.3 | 57.0 | 58.2 | 58.2 | 57.5 | 57.2 | 56.7 |
| Switzerland | … | … | … | 30.0 | 31.8 | 33.9 | 34.8 | 34.8 | 34.6 | 35.3 | 35.6 | 36.1 | 34.6 | 34.0 | 34.8 | 35.4 | 36.0 | 36.0 | 35.7 | 35.2 |
| United Kingdom | 43.6 | 41.1 | 40.5 | 42.2 | 44.0 | 46.1 | 46.1 | 45.3 | 45.0 | 43.0 | 41.4 | 40.2 | 39.7 | 37.5 | 41.0 | 41.8 | 43.7 | 44.4 | 45.0 | 45.2 |
| United States | 37.0 | 36.1 | 36.0 | 37.0 | 37.8 | 38.5 | 38.0 | 37.0 | 36.9 | 36.5 | 35.3 | 34.6 | 34.2 | 34.0 | 35.1 | 36.0 | 36.1 | 35.6 | 35.6 | 35.7 |
| Euro area | 48.9 | 48.4 | 47.9 | 48.7 | 50.1 | 51.3 | 52.9 | 51.8 | 51.4 | 51.5 | 50.2 | 49.3 | 48.9 | 47.1 | 48.1 | 48.5 | 48.9 | 48.6 | 48.2 | 47.7 |
| Total OECD | 40.4 | 39.6 | 39.3 | 40.3 | 41.5 | 42.6 | 43.1 | 42.3 | 42.3 | 41.9 | 40.7 | 40.3 | 40.0 | 39.2 | 40.2 | 40.8 | 41.1 | 40.6 | 40.5 | 40.4 |

Note: Total outlays are defined as current outlays plus capital outlays. Data refer to the general government sector, which is a consolidation of accounts for the central, state and local governments plus social security. One-off revenues from the sale of mobile telephone licenses are recorded as negative capital outlays for countries listed in the note to Table 27. See OECD Economic Outlook Sources and Methods (http://www.oecd.org/eco/sources-and-methods).

a) In 1995 data reflect the large privatisation campaign which transferred some public enterprises to private ownership through vouchers distributed to the population. In 2003 the activation of State guarantees, mainly for the banking sector, accounts for about 7.7 per cent of total outlays.

b) The 1995 outlays are net of the debt taken on this year from the Inherited Debt Funds.

c) The 1998 outlays would be 5.3 percentage points of GDP higher if it included central government's assumption of the debt of the Japan Railway Settlement Corporation and the National Forest Special Account. The 2000 outlays include capital transfers to the Deposit Insurance Company.

d) The 1995 outlays would be 4.9 percentage points of GDP higher if capital transfers to a housing agency offering rentals to low income people were taken into account.

e) These data include outlays net of operating surpluses of public enterprises.

Source: OECD Economic Outlook 76 database.

## Table A2 General Government Total Tax and Non-tax Receipts

(Percent of nominal GDP)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | 36.4 | 35.5 | 34.9 | 34.5 | 33.6 | 33.3 | 33.9 | 34.5 | 35.2 | 35.7 | 36.4 | 37.4 | 37.8 | 36.5 | 36.4 | 36.6 | 36.8 | 36.4 | 36.2 | 35.8 |
| Austria | 50.3 | 50.3 | 49.3 | 49.7 | 50.0 | 51.6 | 52.5 | 51.3 | 50.3 | 51.4 | 51.1 | 51.0 | 50.8 | 49.8 | 51.0 | 50.2 | 49.5 | 48.4 | 47.3 | 46.1 |
| Belgium | 49.0 | 47.7 | 45.7 | 46.6 | 46.9 | 46.6 | 48.3 | 48.3 | 48.5 | 49.3 | 49.4 | 50.0 | 49.6 | 49.5 | 49.9 | 50.3 | 51.3 | 49.1 | 49.1 | 48.6 |
| Canada | 40.6 | 41.0 | 41.2 | 43.0 | 43.9 | 44.2 | 43.5 | 43.0 | 43.2 | 43.8 | 44.5 | 44.5 | 44.1 | 44.1 | 42.9 | 41.2 | 41.2 | 40.6 | 40.1 | 39.9 |
| Czech Republic | .. | .. | .. | .. | .. | .. | .. | .. | 41.0 | 39.7 | 40.0 | 38.8 | 39.2 | 38.5 | 39.1 | 40.2 | 41.9 | 41.7 | 41.2 | 41.3 |
| Denmark | 57.5 | 58.7 | 57.6 | 56.0 | 55.4 | 56.8 | 58.9 | 59.1 | 58.0 | 58.8 | 58.3 | 58.7 | 59.5 | 57.4 | 58.2 | 57.4 | 57.3 | 56.5 | 56.0 | 55.6 |
| Finland | 50.1 | 52.3 | 52.0 | 54.2 | 56.6 | 57.3 | 56.9 | 57.1 | 55.7 | 56.9 | 55.1 | 54.5 | 54.3 | 56.1 | 54.3 | 54.4 | 53.2 | 52.8 | 52.7 | 52.6 |
| France | 49.9 | 49.0 | 48.6 | 48.6 | 49.1 | 48.8 | 49.3 | 49.4 | 49.6 | 51.3 | 51.8 | 51.1 | 51.7 | 51.1 | 50.9 | 50.2 | 50.4 | 50.7 | 51.2 | 51.0 |
| Germany | 44.0 | 43.3 | 44.1 | 42.5 | 44.1 | 45.5 | 46.2 | 46.6 | 46.1 | 46.9 | 46.6 | 46.6 | 47.3 | 47.1 | 45.5 | 45.1 | 45.0 | 43.9 | 43.7 | 43.3 |
| Greece | 35.5 | 32.4 | 31.8 | 34.5 | 35.6 | 37.2 | 38.6 | 40.7 | 40.9 | 41.7 | 43.7 | 45.3 | 45.8 | 47.9 | 46.5 | 45.3 | 43.6 | 44.5 | 44.9 | 44.9 |
| Hungary | .. | .. | .. | .. | 53.7 | 53.2 | 53.2 | 52.3 | 49.3 | 48.1 | 44.6 | 44.5 | 44.6 | 44.8 | 44.3 | 43.2 | 43.6 | 45.9 | 45.8 | 45.5 |
| Iceland | 36.5 | 40.5 | 40.5 | 39.0 | 40.7 | 41.8 | 40.0 | 39.6 | 40.7 | 41.6 | 41.6 | 42.9 | 45.9 | 45.6 | 44.3 | 45.3 | 46.3 | 46.0 | 45.7 | 44.6 |
| Ireland | 43.9 | 44.2 | 40.4 | 40.4 | 42.0 | 42.3 | 42.3 | 42.3 | 39.4 | 39.5 | 38.6 | 37.2 | 36.9 | 36.4 | 34.5 | 33.6 | 34.5 | 34.1 | 33.9 | 33.9 |
| Italy | 39.1 | 40.2 | 41.1 | 42.6 | 43.8 | 46.1 | 47.4 | 45.2 | 45.8 | 46.1 | 48.4 | 46.8 | 47.1 | 46.2 | 46.0 | 45.6 | 46.4 | 45.7 | 45.2 | 45.1 |
| Japan | 31.9 | 32.0 | 32.0 | 33.8 | 33.3 | 33.2 | 31.9 | 31.0 | 31.1 | 31.2 | 31.3 | 30.6 | 30.5 | 30.7 | 31.6 | 30.2 | 29.9 | 30.2 | 30.7 | 31.2 |
| Korea | 20.1 | 21.1 | 22.1 | 22.7 | 22.2 | 23.1 | 23.6 | 23.7 | 24.6 | 25.2 | 25.7 | 26.5 | 26.7 | 29.3 | 29.6 | 30.3 | 31.4 | 31.3 | 31.6 | 31.7 |
| Luxembourg | .. | .. | .. | 48.0 | 45.6 | 46.2 | 47.3 | 47.3 | 47.6 | 47.5 | 46.5 | 45.1 | 44.9 | 44.7 | 45.2 | 45.9 | 45.6 | 44.9 | 44.8 | 44.4 |
| Netherlands | 53.2 | 52.4 | 49.5 | 49.4 | 52.2 | 51.6 | 53.2 | 50.1 | 47.3 | 47.8 | 47.1 | 46.4 | 47.6 | 47.5 | 46.6 | 45.9 | 45.8 | 46.0 | 45.9 | 45.9 |
| New Zealand | 51.0 | 48.8 | 48.3 | 48.9 | 47.7 | 46.3 | 44.7 | 45.4 | 44.9 | 43.9 | 43.5 | 43.0 | 41.7 | 41.3 | 40.6 | 41.0 | 41.4 | 41.2 | 40.8 | 40.9 |
| Norway | 55.1 | 55.3 | 54.0 | 56.2 | 55.0 | 54.4 | 53.7 | 54.4 | 54.9 | 55.6 | 55.0 | 53.1 | 54.3 | 58.2 | 57.9 | 56.5 | 57.1 | 54.9 | 55.6 | 56.7 |
| Poland | .. | .. | .. | .. | .. | .. | .. | .. | 47.4 | 46.5 | 45.7 | 44.5 | 44.9 | 42.5 | 43.8 | 43.9 | 44.3 | 42.3 | 41.9 | 40.8 |
| Portugal | 32.8 | 34.8 | 35.7 | 35.5 | 37.5 | 41.5 | 39.7 | 38.3 | 39.6 | 41.0 | 41.2 | 41.0 | 42.4 | 42.3 | 41.9 | 43.2 | 44.9 | 45.1 | 44.3 | 43.5 |
| Slovak Republic | .. | .. | .. | .. | .. | .. | .. | 51.7 | 53.3 | 54.1 | 58.8 | 57.1 | 49.8 | 47.6 | 45.5 | 45.3 | 35.6 | 35.3 | 35.2 | 34.2 |
| Spain | 38.0 | 37.8 | 39.6 | 39.5 | 40.3 | 42.3 | 42.4 | 40.8 | 38.4 | 38.8 | 38.6 | 38.3 | 39.0 | 39.1 | 39.2 | 39.8 | 40.0 | 40.0 | 40.0 | 40.0 |
| Sweden | 66.2 | 65.5 | 67.3 | 67.2 | 63.6 | 62.6 | 61.5 | 61.6 | 60.7 | 62.4 | 61.9 | 62.6 | 62.6 | 62.4 | 59.9 | 58.0 | 58.3 | 58.0 | 57.9 | 57.8 |
| Switzerland | .. | .. | .. | 30.6 | 30.6 | 31.5 | 32.1 | 32.8 | 33.3 | 33.9 | 33.2 | 34.7 | 34.7 | 36.3 | 35.7 | 35.6 | 35.2 | 35.0 | 35.0 | 35.0 |
| United Kingdom | 41.8 | 41.6 | 41.3 | 40.7 | 40.9 | 39.6 | 38.1 | 38.6 | 39.1 | 38.8 | 39.2 | 40.2 | 40.7 | 41.3 | 41.7 | 40.1 | 40.2 | 41.2 | 41.8 | 41.9 |
| United States | 32.7 | 32.5 | 32.8 | 32.7 | 32.9 | 32.7 | 33.0 | 33.4 | 33.8 | 34.3 | 34.5 | 35.0 | 35.1 | 35.7 | 34.7 | 32.2 | 31.5 | 31.2 | 31.4 | 31.5 |
| Euro area | 44.3 | 44.0 | 44.1 | 44.1 | 45.1 | 46.2 | 47.2 | 46.7 | 46.3 | 47.2 | 47.5 | 47.0 | 47.6 | 47.1 | 46.4 | 46.0 | 46.2 | 45.7 | 45.6 | 45.3 |
| Total OECD | 37.2 | 37.0 | 37.2 | 37.4 | 37.7 | 38.0 | 38.1 | 38.1 | 38.3 | 38.8 | 39.1 | 39.1 | 39.3 | 39.5 | 39.0 | 37.6 | 37.4 | 37.1 | 37.3 | 37.3 |

Note: Data refer to the general government sector, which is a consolidation of accounts for central, state and local governments plus social security. Non-tax receipts consist of property income (including dividends and other transfers from public enterprises), fees, charges, sales, fines, capital transfers received by the general government, etc. See OECD Economic Outlook Sources and Methods (http://www.oecd.org/eco/sources-and-methods).

a) Includes deferred tax payments on postal savings accounts in 2000, 2001 and 2002.

b) Excludes the operating surpluses of public enterprises.

Source: OECD Economic Outlook 76 database.

## Table A3 General Government Financial Balances

(Surplus (+) or deficit (-) as a percent of nominal GDP)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | -2.6 | -0.9 | -0.6 | -1.7 | -4.3 | -6.4 | -5.8 | -4.8 | -3.9 | -2.2 | -0.4 | 0.7 | 2.0 | 0.8 | -0.8 | 0.3 | 0.8 | 0.7 | 0.4 | 0.5 |
| Austria | -4.0 | -2.8 | -2.6 | -2.0 | -2.3 | -1.6 | -3.9 | -4.7 | -5.7 | -4.0 | -2.0 | -2.5 | -2.3 | -1.6 | 0.1 | -0.4 | -1.3 | -1.5 | -2.1 | -2.1 |
| Belgium | -7.9 | -7.3 | -7.7 | -6.8 | -7.5 | -8.1 | -7.4 | -5.1 | -4.4 | -3.8 | -2.0 | -0.7 | -0.4 | 0.2 | 0.6 | 0.1 | 0.3 | -0.1 | -0.4 | -0.5 |
| Canada | -5.4 | -4.3 | -4.6 | -5.8 | -8.4 | -9.1 | -8.7 | -6.7 | -5.3 | -2.8 | 0.2 | 0.1 | 1.6 | 2.9 | 1.1 | 0.3 | 0.6 | 1.1 | 1.2 | 1.0 |
| Czech Republic | .. | .. | .. | .. | .. | .. | .. | .. | -13.4 | -3.1 | -2.4 | -5.0 | -3.6 | -3.7 | -5.9 | -6.8 | -12.6 | -4.3 | -4.6 | -3.9 |
| Denmark | 2.5 | 1.5 | 0.3 | -1.0 | -2.4 | -2.2 | -2.9 | -2.4 | -2.3 | -1.0 | 0.4 | 1.1 | 3.2 | 2.5 | 2.8 | 1.6 | 1.2 | 0.9 | 1.4 | 1.5 |
| Finland | 1.6 | 5.3 | 6.9 | 5.5 | -1.0 | -5.5 | -7.2 | -5.7 | -3.9 | -2.9 | -1.3 | 1.6 | 2.2 | 7.1 | 5.2 | 4.3 | 2.1 | 2.3 | 2.1 | 2.3 |
| France | -2.0 | -2.5 | -1.8 | -2.1 | -2.4 | -4.2 | -6.0 | -5.5 | -5.5 | -4.1 | -3.0 | -2.7 | -1.8 | -1.4 | -1.5 | -3.3 | -4.1 | -3.7 | -3.1 | -2.9 |
| Germany | -1.8 | -2.0 | 0.1 | -2.0 | -2.9 | -2.6 | -3.1 | -2.4 | -3.3 | -3.4 | -2.7 | -2.2 | -1.5 | 1.3 | -2.8 | -3.7 | -3.8 | -3.9 | -3.5 | -2.7 |
| Greece | -9.6 | -11.6 | -13.6 | -15.7 | -11.0 | -12.2 | -13.4 | -9.3 | -10.2 | -7.4 | -4.0 | -2.5 | -1.8 | -4.2 | -3.7 | -3.8 | -4.6 | -5.3 | -3.5 | -3.2 |
| Hungary | .. | .. | .. | .. | -3.0 | -7.1 | -6.6 | -11.0 | -7.6 | -5.9 | -7.2 | -8.0 | -5.6 | -3.0 | -4.7 | -9.3 | -6.2 | -5.4 | -4.9 | -4.5 |
| Iceland | -0.9 | -2.0 | -4.6 | -3.3 | -3.0 | -2.9 | -4.5 | -4.8 | -3.0 | -1.6 | 0.0 | 0.5 | 2.4 | 2.5 | 0.2 | -0.4 | -1.6 | 0.1 | 1.2 | 1.0 |
| Ireland | -8.1 | -4.2 | -1.7 | -2.8 | -2.9 | -3.0 | -2.7 | -2.0 | -2.1 | -0.1 | 1.5 | 2.3 | 2.5 | 4.4 | 1.0 | -0.2 | 0.2 | 0.2 | -0.1 | -0.4 |
| Italy | -11.8 | -11.3 | -11.7 | -11.8 | -11.7 | -10.7 | -10.3 | -9.3 | -7.6 | -7.1 | -2.7 | -3.1 | -1.8 | -0.7 | -2.7 | -2.4 | -2.5 | -2.9 | -3.1 | -3.6 |
| Japan | 0.3 | 1.1 | 1.8 | 2.1 | 1.8 | 0.8 | -2.4 | -3.8 | -4.7 | -5.1 | -3.8 | -5.5 | -7.2 | -7.5 | -6.1 | -7.9 | -7.7 | -6.5 | -6.4 | -6.3 |
| Korea | 2.4 | 3.2 | 3.1 | 3.2 | 1.6 | 1.3 | 2.2 | 2.8 | 3.8 | 3.4 | 3.3 | 1.7 | 2.9 | 5.4 | 4.6 | 5.5 | 4.1 | 3.4 | 3.4 | 3.4 |
| Luxembourg | .. | .. | .. | 4.8 | 1.2 | 0.2 | 1.5 | 2.7 | 2.1 | 1.9 | 3.2 | 3.2 | 3.7 | 6.0 | 6.4 | 2.8 | 0.8 | -0.4 | -0.8 | -1.2 |
| Netherlands | -5.3 | -4.2 | -5.0 | -5.3 | -2.7 | -4.2 | -2.8 | -3.5 | -4.2 | -1.8 | -1.1 | -0.8 | 0.7 | 2.2 | -0.1 | -1.9 | -3.2 | -2.9 | -2.7 | -1.9 |
| New Zealand | -2.6 | -4.0 | -3.6 | -4.3 | -3.9 | -3.3 | -1.3 | 2.5 | 3.0 | 2.9 | 1.9 | 0.3 | 0.6 | 1.5 | 2.0 | 2.5 | 3.1 | 2.9 | 2.1 | 1.9 |
| Norway | 4.6 | 2.6 | 1.8 | 2.2 | 0.1 | -1.9 | -1.4 | 0.3 | 3.4 | 6.5 | 7.7 | 3.6 | 6.2 | 15.6 | 13.6 | 9.1 | 8.3 | 8.2 | 10.5 | 11.4 |
| Poland | .. | .. | .. | .. | .. | .. | .. | .. | -3.9 | -4.7 | -4.5 | -4.0 | -3.2 | -2.4 | -3.8 | -4.9 | -3.8 | -5.4 | -4.7 | -4.3 |
| Portugal | -7.2 | -3.8 | -3.1 | -6.6 | -7.6 | -4.8 | -8.1 | -7.7 | -5.5 | -4.8 | -3.6 | -3.2 | -2.9 | -2.9 | -4.4 | -2.7 | -2.8 | -2.9 | -3.0 | -3.8 |
| Slovak Republic | .. | .. | .. | .. | .. | .. | .. | -6.1 | -0.9 | -7.4 | -6.2 | -3.8 | -7.1 | -12.3 | -6.0 | -5.7 | -3.7 | -3.9 | -3.8 | -3.9 |
| Spain | -3.1 | -3.1 | -2.6 | -3.9 | -4.6 | -3.7 | -7.0 | -6.5 | -6.6 | -5.0 | -3.2 | -3.0 | -1.2 | -0.9 | -0.4 | -0.1 | 0.4 | -1.1 | -0.1 | -0.1 |
| Sweden | 3.8 | 2.9 | 4.8 | 3.8 | -1.9 | -7.6 | -11.4 | -9.3 | -6.9 | -2.8 | -1.0 | 1.9 | 2.3 | 5.1 | 2.9 | -0.3 | 0.1 | 0.5 | 0.7 | 1.2 |
| Switzerland | .. | .. | .. | 0.6 | -1.1 | -2.4 | -2.7 | -1.9 | -1.2 | -1.4 | -2.4 | -1.5 | 0.0 | 2.3 | 0.9 | 0.2 | -0.8 | -1.0 | -0.6 | -0.2 |
| United Kingdom | -1.8 | 0.5 | 0.8 | -1.6 | -3.1 | -6.5 | -7.9 | -6.8 | -5.8 | -4.2 | -2.2 | 0.1 | 1.0 | 3.8 | 0.7 | -1.7 | -3.5 | -3.2 | -3.2 | -3.3 |
| United States | -4.3 | -3.6 | -3.2 | -4.2 | -4.9 | -5.8 | -4.9 | -3.6 | -3.1 | -2.2 | -0.8 | 0.4 | 0.9 | 1.6 | -0.4 | -3.8 | -4.6 | -4.4 | -4.1 | -4.2 |
| Euro area | -4.5 | -4.4 | -3.7 | -4.6 | -5.0 | -5.1 | -5.8 | -5.1 | -5.1 | -4.3 | -2.6 | -2.3 | -1.3 | 0.1 | -1.7 | -2.4 | -2.8 | -2.9 | -2.6 | -2.4 |
| Total OECD | -3.2 | -2.6 | -2.1 | -2.9 | -3.7 | -4.6 | -5.0 | -4.2 | -4.0 | -3.1 | -1.7 | -1.2 | -0.8 | 0.3 | -1.2 | -3.2 | -3.7 | -3.5 | -3.2 | -3.2 |
| *Memorandum items* | | | | | | | | | | | | | | | | | | | | |
| **General government financial balances excluding social security** | | | | | | | | | | | | | | | | | | | | |
| United States | -4.8 | -4.4 | -4.2 | -5.3 | -5.8 | -6.6 | -5.6 | -4.4 | -3.9 | -3.1 | -1.9 | -0.8 | -0.6 | 0.1 | -2.0 | -5.4 | -6.0 | -5.7 | -5.6 | -5.8 |
| Japan | -2.5 | -2.0 | -1.4 | -1.4 | -0.9 | -1.7 | -4.6 | -5.7 | -6.6 | -6.8 | -5.6 | -6.9 | -8.3 | -8.0 | -6.2 | -7.7 | -7.4 | -6.2 | -6.1 | -6.1 |

Note: Financial balances include one-off revenues from the sale of the mobile telephone licenses. These revenues are substantial in a number of countries including Australia (2000-2001), Austria (2000), Belgium (2001), Denmark (2001), France (2001-2002), Germany (2000), Greece (2001), Ireland (2002), Italy (2000), Netherlands (2000), New Zealand (2001), Portugal (2000), Spain (2000) and the United Kingdom (2000). As data are on a national account basis, the government financial balance may differ from the numbers reported to the European Commission under the Excessive Deficit Procedure for some EU countries. For more details see footnotes to Annex Tables 25 and 26 and OECD Economic Outlook Sources and Methods (http://www.oecd.org/eco/sources-and-methods).

a) Recent revisions to Greek budgetary data suggest deficits of 6.6, 4.3 and 3.4 per cent of GDP in 1997-1999 respectively. At the cut-off date for information, no data were available for the underlying changes to the spending and revenue components.

b) Prior to 1991, when SNA93 was adopted, these data included private pension funds.

Source: OECD Economic Outlook 76 database.

## Table A4 General Government Gross Financial Liabilities

(Percent of nominal GDP)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | .. | 27.5 | 25.0 | 23.1 | 23.9 | 28.7 | 32.2 | 42.6 | 44.6 | 41.4 | 39.6 | 34.1 | 28.4 | 25.2 | 22.1 | 20.7 | 19.6 | 20.6 | 18.2 | 18.0 |
| Austria | 58.1 | 59.2 | 58.2 | 57.6 | 57.6 | 57.3 | 62.1 | 65.0 | 69.7 | 69.9 | 69.9 | 67.4 | 69.8 | 69.4 | 70.2 | 71.9 | 69.7 | 69.5 | 69.9 | 70.2 |
| Belgium | 128.7 | 129.1 | 125.7 | 129.7 | 131.4 | 140.5 | 144.3 | 141.2 | 138.8 | 136.1 | 129.9 | 124.7 | 120.3 | 115.0 | 113.5 | 110.4 | 104.9 | 100.4 | 100.1 | 96.6 |
| Canada | 71.5 | 71.1 | 72.3 | 74.5 | 82.1 | 89.9 | 96.9 | 98.2 | 100.8 | 100.3 | 96.2 | 93.9 | 89.5 | 81.8 | 81.0 | 77.7 | 73.3 | 70.6 | 67.2 | 64.8 |
| Czech Republic | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 12.2 | 12.9 | 13.4 | 18.2 | 25.3 | 28.8 | 37.8 | 39.1 | 41.1 | 42.5 |
| Denmark | 72.2 | 70.7 | 69.0 | 69.8 | 70.8 | 74.9 | 88.9 | 82.4 | 78.4 | 74.5 | 70.4 | 67.1 | 61.1 | 54.4 | 53.7 | 54.1 | 49.5 | 48.4 | 46.8 | 45.2 |
| Finland | 20.3 | 19.1 | 16.9 | 16.7 | 25.1 | 45.1 | 58.3 | 60.9 | 65.7 | 66.6 | 64.8 | 61.4 | 55.9 | 53.2 | 51.3 | 50.8 | 51.5 | 51.8 | 52.5 | 53.0 |
| France | 40.1 | 40.0 | 39.9 | 39.5 | 40.3 | 44.7 | 51.6 | 55.3 | 63.9 | 67.5 | 69.4 | 71.1 | 67.3 | 66.2 | 64.9 | 68.7 | 71.2 | 74.0 | 76.2 | 77.4 |
| Germany | 41.8 | 42.3 | 40.9 | 41.5 | 38.8 | 41.8 | 47.4 | 47.9 | 57.1 | 60.3 | 61.8 | 63.2 | 61.6 | 60.9 | 60.5 | 62.9 | 65.1 | 67.0 | 68.6 | 69.1 |
| Greece | 53.0 | 62.7 | 65.7 | 79.6 | 82.2 | 87.8 | 110.1 | 107.9 | 108.7 | 111.3 | 108.2 | 105.8 | 105.2 | 114.0 | 114.7 | 112.5 | 109.9 | 112.1 | 111.4 | 107.2 |
| Hungary | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 67.3 | 64.9 | 66.4 | 60.2 | 60.1 | 61.1 | 60.3 | 57.1 | 58.8 | 60.2 |
| Iceland | 28.1 | 31.5 | 37.3 | 36.9 | 39.1 | 47.2 | 54.2 | 56.9 | 60.3 | 57.6 | 54.3 | 49.3 | 44.5 | 41.9 | 47.4 | 43.6 | 41.6 | 37.1 | 33.9 | 31.9 |
| Ireland | 111.7 | 108.1 | 98.7 | 94.0 | 95.4 | 92.4 | 95.0 | 89.5 | 81.9 | 73.4 | 64.6 | 53.7 | 48.7 | 38.3 | 35.9 | 32.7 | 32.1 | 29.3 | 26.9 | 25.3 |
| Italy | 98.1 | 100.3 | 103.3 | 112.5 | 116.5 | 126.0 | 127.9 | 134.4 | 133.5 | 135.7 | 133.0 | 133.4 | 128.4 | 124.5 | 122.0 | 121.5 | 120.9 | 120.0 | 119.5 | 119.3 |
| Japan | 76.4 | 74.1 | 70.8 | 68.6 | 64.8 | 68.7 | 74.9 | 79.7 | 87.1 | 93.9 | 100.3 | 112.2 | 125.7 | 134.1 | 142.3 | 149.3 | 157.5 | 163.5 | 170.0 | 175.4 |
| Korea | 12.6 | 9.6 | 8.8 | 7.7 | 6.7 | 6.3 | 5.6 | 5.2 | 5.5 | 5.9 | 7.5 | 13.1 | 15.6 | 16.3 | 17.4 | 16.6 | 18.7 | 19.3 | 20.0 | 21.3 |
| Luxembourg | .. | .. | .. | 5.4 | 4.6 | 5.5 | 6.8 | 6.3 | 6.7 | 7.2 | 6.8 | 6.3 | 6.0 | 5.5 | 5.5 | 5.7 | 5.3 | 5.2 | 5.2 | 5.4 |
| Netherlands | 85.4 | 87.5 | 88.2 | 87.8 | 88.9 | 92.8 | 97.7 | 87.7 | 90.8 | 89.8 | 84.5 | 82.9 | 74.2 | 66.7 | 62.1 | 62.1 | 63.2 | 66.1 | 68.1 | 68.7 |
| New Zealand | .. | .. | .. | .. | .. | .. | 70.8 | 62.7 | 56.9 | 50.8 | 50.1 | 49.7 | 47.1 | 44.7 | 42.2 | 40.2 | 37.4 | 34.6 | 33.2 | 32.3 |
| Norway | 33.7 | 32.8 | 32.8 | 29.3 | 27.5 | 32.2 | 40.5 | 36.9 | 34.4 | 30.7 | 27.5 | 26.2 | 26.8 | 30.0 | 29.2 | 35.7 | 35.2 | 34.9 | 31.1 | 26.8 |
| Poland | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 45.6 | 41.8 | 43.2 | 40.0 | 41.0 | 46.7 | 51.6 | 53.2 | 57.0 | 58.5 |
| Portugal | .. | .. | .. | .. | .. | .. | .. | .. | 72.5 | 71.8 | 68.0 | 64.2 | 62.8 | 61.4 | 65.1 | 68.1 | 70.3 | 70.6 | 71.8 | 73.9 |
| Slovak Republic | .. | .. | .. | .. | .. | .. | .. | .. | .. | 30.6 | 33.1 | 34.0 | 47.2 | 49.9 | 48.7 | 43.4 | 42.8 | 40.1 | 38.9 | 37.7 |
| Spain | .. | .. | .. | 48.8 | 50.7 | 53.0 | 66.8 | 65.4 | 70.3 | 77.1 | 76.0 | 76.1 | 70.3 | 67.3 | 63.5 | 61.3 | 59.4 | 58.4 | 56.3 | 54.2 |
| Sweden | 62.5 | 56.1 | 51.0 | 46.8 | 55.5 | 74.0 | 79.0 | 83.5 | 82.2 | 84.7 | 82.8 | 81.2 | 71.6 | 64.2 | 63.2 | 62.1 | 61.9 | 61.2 | 60.3 | 59.0 |
| United Kingdom | 48.9 | 42.8 | 36.9 | 33.0 | 33.6 | 39.8 | 49.6 | 47.8 | 52.7 | 52.6 | 53.2 | 53.8 | 48.8 | 45.9 | 41.2 | 41.5 | 42.0 | 43.4 | 44.9 | 46.5 |
| United States | 64.1 | 64.8 | 65.1 | 66.6 | 71.3 | 73.7 | 75.4 | 74.6 | 74.2 | 73.4 | 70.9 | 67.7 | 64.1 | 58.2 | 57.9 | 60.2 | 62.5 | 63.5 | 64.9 | 66.8 |
| Euro area | 59.5 | 60.1 | 60.3 | 62.7 | 63.3 | 66.8 | 72.2 | 73.3 | 78.7 | 82.7 | 82.6 | 82.7 | 79.2 | 77.0 | 75.5 | 76.6 | 77.4 | 78.3 | 79.0 | 78.9 |
| Total OECD | 61.9 | 60.8 | 60.1 | 60.8 | 62.7 | 66.3 | 70.4 | 71.2 | 73.9 | 75.5 | 74.3 | 74.6 | 73.4 | 70.9 | 71.1 | 73.2 | 75.4 | 76.8 | 78.4 | 79.8 |

Note: Gross debt data are not always comparable across countries due to different definitions or treatment of debt components. Notably, they include the funded portion of government employee pension liabilities for some OECD countries, including Australia and the United States. The debt position of these countries is thus overstated relative to countries that have large unfunded liabilities for such pensions which according to ESA95/SNA93 are not counted in the debt figures, but rather as a memorandum item to the debt. General government financial liabilities presented here are defined according to ESA95/SNA93 for all countries with the exception of the Czech Republic, Greece, Ireland, Luxembourg and the Slovak Republic where debt measures follow the definition of debt applied under the Maastricht Treaty. Maastricht debt for European Union countries is shown in Annex Table 60. For more details see OECD Economic Outlook Sources and Methods (http://www.oecd.org/eco/sources-and-methods).

a) Includes the debt of the Inherited Debt Fund from 1995 onwards.

b) Recent revisions to Greek budgetary data suggest gross debt data of 114.0, 112.4 and 112.3 per cent of GDP in 1997-1999 respectively.

c) Includes the debt of the Japan Railway Settlement Corporation and the National Forest Special Account from 1998 onwards.

Source: OECD Economic Outlook 76 database.

## Table A5 General Government Net Financial Liabilities

(Percent of nominal GDP)

| | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Australia | .. | 16.3 | 11.9 | 10.9 | 11.7 | 16.5 | 22.6 | 27.5 | 28.2 | 22.3 | 22.5 | 17.0 | 15.9 | 9.9 | 5.8 | 4.1 | 2.4 | 1.9 | 1.4 | 0.9 |
| Austria | 34.6 | 36.4 | 35.9 | 35.4 | 35.3 | 36.4 | 41.1 | 43.2 | 47.8 | 47.3 | 48.0 | 44.2 | 44.5 | 43.1 | 43.6 | 45.2 | 43.4 | 43.2 | 43.6 | 43.9 |
| Belgium | 120.2 | 120.6 | 117.2 | 116.9 | 118.2 | 125.2 | 127.9 | 126.2 | 125.6 | 123.3 | 118.3 | 112.8 | 107.7 | 102.5 | 100.1 | 97.9 | 95.3 | 90.8 | 90.5 | 87.0 |
| Canada | 39.3 | 38.2 | 41.1 | 43.3 | 50.0 | 58.5 | 64.4 | 67.4 | 69.3 | 67.5 | 63.5 | 60.8 | 53.5 | 44.8 | 40.5 | 37.9 | 34.3 | 31.1 | 28.1 | 25.7 |
| Denmark | 18.7 | 19.8 | 18.6 | 18.4 | 21.0 | 23.1 | 25.3 | 25.6 | 25.9 | 24.5 | 21.3 | 21.1 | 12.6 | 8.7 | 6.5 | 7.9 | 4.7 | 3.6 | 2.0 | 0.4 |
| Finland | -28.0 | -29.2 | -33.4 | -35.6 | -34.1 | -24.9 | -16.1 | -16.3 | -3.8 | -6.5 | -7.4 | -15.0 | -51.5 | -31.5 | -32.5 | -32.3 | -33.8 | -34.8 | -35.5 | -36.1 |
| France | 13.3 | 15.1 | 15.7 | 17.5 | 18.8 | 20.4 | 27.1 | 28.3 | 38.9 | 42.6 | 43.3 | 41.7 | 33.6 | 34.9 | 36.7 | 42.3 | 44.1 | 46.1 | 47.6 | 48.7 |
| Germany | 21.1 | 22.0 | 20.5 | 21.0 | 20.2 | 24.5 | 28.1 | 29.3 | 39.6 | 42.5 | 43.4 | 46.1 | 45.3 | 42.4 | 44.1 | 48.6 | 51.9 | 54.7 | 57.1 | 58.0 |
| Hungary | .. | .. | .. | .. | .. | .. | .. | .. | .. | .. | 24.0 | 30.6 | 32.7 | 30.9 | 33.5 | 39.8 | 39.7 | 41.8 | 43.5 | 44.9 |
| Iceland | 8.2 | 9.9 | 17.9 | 19.4 | 20.1 | 27.1 | 35.3 | 38.4 | 40.4 | 40.2 | 38.2 | 31.7 | 24.1 | 24.0 | 26.9 | 23.4 | 23.5 | 22.7 | 20.6 | 18.6 |
| Italy | 88.8 | 91.0 | 93.9 | 84.1 | 89.0 | 97.8 | 106.0 | 111.3 | 109.2 | 110.9 | 107.0 | 108.2 | 103.7 | 98.9 | 96.9 | 97.7 | 97.1 | 96.2 | 95.8 | 95.5 |
| Japan | 55.6 | 46.9 | 38.3 | 24.6 | 12.6 | 14.3 | 17.7 | 20.3 | 24.5 | 29.7 | 35.2 | 45.8 | 53.6 | 59.1 | 65.2 | 71.4 | 79.1 | 84.4 | 90.1 | 94.7 |
| Korea | -9.3 | -12.8 | -15.4 | -16.3 | -15.1 | -14.6 | -15.3 | -16.0 | -17.4 | -19.0 | -21.5 | -23.1 | -23.9 | -27.0 | -30.0 | -31.8 | -29.0 | -30.7 | -32.7 | -34.3 |
| Netherlands | 25.6 | 29.2 | 32.5 | 33.4 | 34.6 | 40.6 | 45.3 | 44.2 | 54.1 | 52.9 | 50.7 | 48.0 | 36.6 | 35.1 | 33.3 | 35.3 | 36.8 | 39.0 | 41.1 | 41.6 |
| New Zealand | .. | .. | .. | .. | .. | .. | 47.9 | 40.8 | 34.7 | 30.7 | 28.4 | 25.8 | 23.8 | 20.7 | 20.3 | 18.0 | 13.9 | 9.9 | 7.4 | 5.2 |
| Norway | -42.6 | -42.7 | -41.9 | -41.7 | -37.9 | -35.6 | -32.4 | -31.0 | -32.6 | -36.5 | -42.9 | -46.9 | -52.7 | -60.6 | -71.9 | -72.5 | -78.9 | -80.5 | -83.9 | -91.1 |
| Portugal | .. | .. | .. | .. | .. | .. | .. | .. | 26.4 | 28.6 | 28.7 | 28.3 | 27.2 | 27.1 | 29.5 | 33.2 | 35.4 | 35.7 | 36.9 | 39.0 |
| Spain | .. | .. | .. | 30.7 | 32.7 | 33.2 | 41.5 | 43.5 | 48.9 | 53.1 | 52.3 | 51.7 | 46.2 | 43.3 | 41.8 | 39.9 | 38.0 | 37.0 | 34.9 | 32.8 |
| Sweden | 6.3 | 0.2 | -5.9 | -7.8 | -5.0 | 4.5 | 10.3 | 20.4 | 25.3 | 25.7 | 23.1 | 20.0 | 9.4 | 1.4 | -2.9 | 4.8 | 4.5 | 3.8 | 2.9 | 1.6 |
| United Kingdom | 25.8 | 20.5 | 15.6 | 14.9 | 15.5 | 22.5 | 32.3 | 33.0 | 38.9 | 40.5 | 42.6 | 43.7 | 39.8 | 36.9 | 33.5 | 34.3 | 34.9 | 36.3 | 37.8 | 39.4 |
| United States | 46.5 | 47.6 | 47.7 | 48.9 | 52.5 | 55.9 | 58.4 | 57.9 | 57.2 | 56.3 | 53.1 | 49.3 | 44.3 | 39.0 | 38.0 | 40.7 | 42.8 | 44.3 | 45.7 | 47.6 |
| Euro area | 35.4 | 36.9 | 37.3 | 36.1 | 37.5 | 40.6 | 45.4 | 46.6 | 53.1 | 56.4 | 55.8 | 55.8 | 50.8 | 49.0 | 49.1 | 51.5 | 52.5 | 53.4 | 54.0 | 54.0 |
| Total OECD | 39.9 | 38.6 | 37.2 | 35.4 | 36.1 | 39.6 | 43.4 | 44.3 | 46.9 | 48.0 | 47.0 | 46.7 | 43.5 | 40.8 | 40.6 | 43.1 | 45.2 | 46.6 | 48.0 | 49.2 |

Note: Net debt measures are not always comparable across countries due to different definitions or treatment of debt (and asset) components. First, the treatment of government liabilities in respect of their employee pension plans may be different (see note to Annex Table 32). Second, a range of items included as general government assets differs across countries. For example, equity holdings are excluded from government assets in some countries whereas foreign exchange, gold and SDR holdings are considered as assets in the United States and the United Kingdom. For details see OECD Economic Outlook Sources and Methods (http://www.oecd.org/eco/sources-and-methods).

a) From 1995 onwards-housing corporation shares are no longer classified as financial assets.

b) Includes the debt of the Inherited Debt Fund from 1995 onwards.

c) Includes the debt of the Japan Railway Settlement Corporation and the National Forest Special Account from 1998 onwards.

Source: OECD Economic Outlook 76 database.

## Exercise

(1) Given the budget surplus as in the case of U.S. in 1998-2001, what is the most appropriate way to spend this surplus? Read Auerbach and Gale (2001), Viard, Alan D. (1999) and Tobin (2001).

(2) What are shortfalls in the framework of generational accounting? Are comparative statics of generational accounting suitable for public deficit analyis?

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