
Fiscal Sustainability and Fiscal Risk: An Analytical Framework

Carlo Cottarelli

1.1 Introduction

Developments over the last few years have evidenced the damaging effects of fiscal crises on economic activity. The term “fiscal crisis” here refers to the difficulty the government experiences in rolling over its debt. This difficulty shows up in forms of varying intensity, from the need to pay higher interest rates on government paper to a complete loss of market access. These difficulties reverberate through the economy, as higher risk premia are applied also to private sector borrowers and as increased uncertainty on future prospects discourages investment and consumption. Inevitably, economic growth suffers as evidenced by the experience of several euro area countries during 2011 to 2012, and of several emerging economies during the past decades. This chapter discusses the factors that affect markets’ perceptions of the risk of a fiscal crisis, or of rollover problems. Clearly, this perception does not depend on any single fiscal indicator, certainly not just on the level of debt: interest rates, which should reflect the average perception of investors about the rollover risks, are currently very different across advanced economies with the same debt ratio. As another example, debt tolerance has traditionally been seen to be lower for emerging economies, involving lower debt thresholds in assessing their exposure to risk. Thus things are more complicated.

The objective of this chapter is to provide a sort of “checklist” or a way of framing the analysis of the relevant factors, rather than to provide a specific quantitative assessment of what affects the perception of rollover risks, and hence risk premia. In the process, I will comment on the key challenges that economies are facing following the deterioration of the fiscal accounts in 2008 to 2009, thus providing a “road map” for the entire volume. Section 1.2 will review some basic concepts and present the conceptual framework used to discuss rollover risks, breaking down the analysis into factors affecting the baseline fiscal projections, the risks around those projections, and other relevant factors affecting the perception of rollover risks. These three components (baseline, risks around the baseline, and other

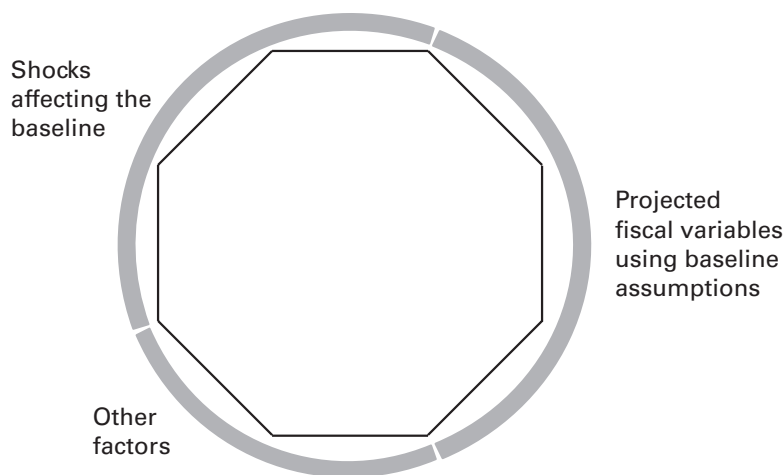


Figure 1.1
Risk octagon

factors) will then be discussed in turn in the next three sections. Section 1.6 concludes.

1.2 Some Basic Concepts

The factors affecting rollover risks will be summarized in a “risk octagon,” with each side of the octagon representing one risk dimension (figure 1.1). What are the key risk dimensions?

Figure 1.1 identifies three main risk areas referring to (1) the baseline fiscal projections (with three different risk dimensions); (2) fiscal risks, that is, the risks that the baseline fiscal projections will not materialize (also with three risk dimensions); and (3) other factors (two additional dimensions).

Let us consider the first area. What are the most relevant fiscal variables that affect the perception of rollover risks? Borrowers can face difficulties in rolling over their debt for a number of reasons, not necessarily related to their economic and financial conditions. Lenders can, for example, become illiquid and require the repayment of their debt. Illiquidity problems can also arise because of monetary policy: a monetary tightening would raise interest rates.

We are here, however, concerned about rollover problems arising from the markets’ perception that the government may be unable to service all its debt. For a sovereign operating in relatively developed and liquid financial markets, these rollover problems necessarily involve doubts about government solvency.¹ The term “govern-

ment insolvency” refers to a balance sheet condition in which the net worth of the government, in the absence of debt repudiation, is negative.²

Thus a good starting point to assess the factors affecting the perception of rollover risks is the government solvency condition, stating that the net present value of its non-interest revenues minus its non-interest expenditures—or, alternatively, the net present value of its primary balance—is equal to (or higher than) its net debt.³ While a more detailed treatment of this condition is given in chapter 2, it is worth here recalling that in cases where the interest rate on government debt is higher than the growth rate of the economy, the intertemporal budget constraint of the government is always met when the public (net) debt-to-GDP ratio is stable. In turn, the latter is stable when the primary balance, in relation to GDP, is equal to the differential between the interest rate on public debt and the growth rate of the economy (scaled by one plus the GDP growth rate) times the debt ratio:⁴

$$pb = [(i - g)/(1+g)]d,$$

where d is the stock of net debt at the end of the previous period, pb is the primary balance during the current period, i is the average nominal interest rate on public debt, and g is the nominal growth rate of GDP.⁵ All this implies that assessing solvency risks, given a certain initial debt stock, requires, as a starting point, looking at baseline projections for the primary balance, the interest rate on public debt, and the growth rate of GDP (what we will call “fiscal fundamentals”). It should be underscored that what matters is not only the current values of these variables but their future values too.

One clarification is in order, though. The interest rate on government debt reflects in itself markets’ assessment of rollover risks. It is therefore the variable that needs to be explained. It is important to focus on what affects the interest rate. Among these factors is the composition of government assets and liabilities, as well as the strength of its investors’ base.

Altogether, the first risk area of the octagon (baseline projections for fiscal variables) includes three dimensions of risk: (1) short-term projections on fiscal fundamentals, (2) longer term projections on fiscal fundamentals, and (3) asset and liability management variables, affecting, other conditions being the same, the interest rate on government debt.

The second area refers to shocks that may move fiscal outcomes away from the baseline, or, in the jargon of public financial management, what we call “fiscal risks.”⁶ These are relevant because the higher the uncertainty around the baseline (particularly the higher is the likelihood of negative shocks), the higher will be the risk premium required by markets to cover the rollover risk. Three kinds of shocks will be considered: macroeconomic shocks (essentially on output and inflation), shocks from contingent liabilities, and policy shocks.

Finally, the third area includes two residual dimensions: the first one refers to non-fiscal variables that can influence the perception of rollover risks; the second refers to the market's attitude toward risk-taking.

1.3 Baseline Fiscal Projections

1.3.1 Short-Term Fiscal Fundamentals

As noted, assessing rollover risks requires forming a view on how the primary balance will evolve over time, in relation to an initial debt stock.

Observers of fiscal variables and interest rates spreads in 2011 may soon reach the conclusion that fiscal fundamentals do not matter much. Among advanced economies, the two countries with the highest primary deficit in 2011 were Japan and the United States. Yet these countries could borrow at low rates in both real and nominal terms.⁷ Definitely, this shows that current key fiscal variables are not the only thing that matters in affecting risk perception. But do they matter at all?

Econometric evidence suggests that current fiscal variables are important (e.g., see Cottarelli and Jaramillio 2012; Baldacci et al. 2011; Ardagna 2009). The point, however, is fairly evident by simple data inspection. Figure 1.2 reports primary balance gaps (the difference between the primary balance and the primary balance that would stabilize the debt-to-GDP ratio at the current interest and growth rates) and debt ratios for advanced economies in 2011. The size of each country balloon is proportional to the ten-year CDS spread for that country. All large balloons cor-

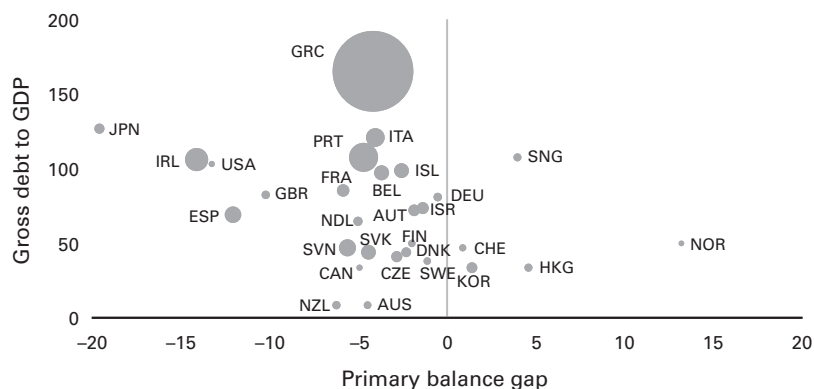


Figure 1.2

Advanced economies: Primary balance gap versus debt-to-GDP ratio, 2011. The primary balance gap is the difference between the actual primary balance in 2011 and the primary balance that would stabilize debt at 2011 level. CDS spreads are for end-period. Net debt for Australia, Canada, Japan, and New Zealand.

Sources: IMF, *Fiscal Monitor*, October 2012; Markit

respond to a combination of high primary gap and high debt. Also there are some small balloons in that area, suggesting that if a combination of high primary deficit and high debt is not a sufficient condition to be under market pressure, it is at least a necessary condition.

The sharp deterioration in primary balances during 2008 and 2009, particularly in advanced economies, is documented in chapter 7. How large should the primary balance adjustment be? And would such a correction be feasible and sustainable?

From a technical point of view, restoring fiscal solvency simply requires bringing the primary balance to a level that stabilizes the debt-to-GDP ratio, given certain assumptions on the interest-rate–growth differential. Debt stability, even at a very high level, is all that is needed. However, there are various reasons why the goal of fiscal adjustment cannot just be the stabilization of the debt ratio at any level. First, the higher the debt level is, the more a country is exposed to interest rate and growth shocks: when debt is high, an increase in interest rates requires a higher adjustment in the primary balance to absorb it, and this exposure raises the premium that a country has to pay to roll over its debt. Second, and related, several (although not all) empirical studies show an inverse relationship between public debt and growth (see chapter 5), at least beyond a certain debt threshold. All this points at the need to improve the primary balance with the goal not only of stabilizing the debt ratio but also of lowering it (see medium-term adjustment scenarios discussed in IMF 2012a).

As to whether a correction would be feasible and sustainable, there are two issues:

- The first relates to the magnitude of the correction and the cost that a fiscal tightening would have for economic activity. The evidence suggests that the fiscal multiplier can be sizable when output is below potential and when the economy is in a liquidity trap (see chapter 12) so that the cost of a fiscal tightening, in term of forgone output, can be sizable. Financial markets seems to have focused quite a lot on this link between fiscal adjustment and growth during 2011 and 2012, which is one key reason why interest rates remained high for countries undertaking sizable fiscal adjustments (e.g., see the discussion in Cottarelli and Jaramillo 2012). This said, a fiscal tightening caused only a temporary deceleration in growth (and even the effect on the level of output should eventually fade away).
- The second relates to the economic and political difficulty of keeping the primary balance at a high level for a prolonged period of time. This takes us to the second dimension of the risk octagon.

1.3.2 Future Developments in Fiscal Variables

The second dimension of the risk octagon refers to the future evolution of the primary balance, as well as the future growth rate. Given the intertemporal nature of the

government's budget constraint, the current deficit should play only a minor role in assessing fiscal solvency risks. What matters is the future level of primary balances, since this affects the long-term dynamics of the debt ratio. This has several implications for assessing fiscal solvency risks.

First, it is important to correct the primary balance for any temporary factors that may affect its current level, hence the importance of looking at cyclically adjusted primary balances. Correcting fiscal balances for the output cycle is by now fairly common practice. Less common, regrettably, is to correct the primary balance for the effect of other cyclical factors (e.g., asset price and commodity price cycles) as well as for a host of other temporary factors (e.g., temporary revenues or spending) (Bornhorst et al. 2011). Primary balances should also, of course, take into account announced policy changes if they are credible enough to affect the baseline.

Second, factors affecting long-term spending and revenue trends should be closely considered. Among spending trends, those related to spending for pension and health care are particularly important, given the magnitude of the projected increase (see chapter 19). Among revenue trends, of particular importance for emerging economies are trends in revenues from exhaustible resources.⁸ One issue is the relative importance of these long-term spending trends vis-à-vis short- and medium-term developments. The empirical evidence that some of these long-term trends affect interest rates is at present very limited. For example, we are not aware of studies showing that spending trends in health care and pension spending affect interest rates or yields. On the contrary, Cottarelli and Jaramillo (2012) show that markets seem to primarily focus on current fiscal variables such as the current public debt and deficit ratios. It is, however, true that poor trends in entitlement spending are often quoted by market analysts as signaling severe fiscal weaknesses. Thus more work is needed in this area to quantify the impact of these long-term trends on measures of risk perception. In any case, even if the impact is limited in the short run, addressing these challenges would still be important to avoid future increases in interest rates when they eventually materialize.

Finally, and perhaps more crucial, is the issue of the economic and political sustainability of keeping the primary balance at high levels for a prolonged time. Keeping the primary balance high means keeping taxation and public spending at respectively higher and lower levels than in other countries, with negative effects on competitiveness and growth, with related political difficulties. Chapter 4 discusses the evidence of what affects the primary balance in the medium term in normal circumstances, thus providing a benchmark for assessing the difficulty of running primary balances above the norm. One important factor is growth, as there is evidence that higher growth rates tend to be associated with higher primary balances, although it is less clear whether this effect goes beyond cyclical factors in a signifi-

cant way.⁹ Altogether, concerns about public debt sustainability hinge on whether markets believe countries will do what it takes to keep the primary balance at a sufficiently high level to stabilize or, as discussed, lower the debt ratio. If they perceive the absence of an adequate resolve to do so, fear of debt restructuring will arise with negative implications for rollover risks.¹⁰

One final comment relates to various factors that can affect the perception that medium-term fiscal trends will be benign despite the difficulties inherent in fiscal adjustment. Among these, one should include fiscal institutions promoting fiscal rectitude (see the discussion below on the likelihood of fiscal policy shocks). More generally, perceptions that fiscal rectitude is a core value for the population can also affect market perceptions that adjustment will eventually take place.¹¹

1.3.3 Assets and Liability Structure and the Investor Base

While, in principle, the analysis of solvency can be conducted in terms of net debt, in practice, the likelihood of a rollover crisis depends a lot on the composition of assets and liabilities in terms of maturity, currency denomination, and characteristics of the investor base.

Maturity is important because it affects the borrowing requirement that the government has to face in each period: this matters because the lower the financing requirements are, the lower the risk that underlying fiscal solvency concerns will lead to a rollover crisis before they can be addressed through policy actions. Maturity is also important because it affects the speed at which a shock on market interest rates carries over to the average interest rate on government debt. In this respect, the situation of some advanced countries that have been under financial market pressure during 2010 and 2012 would have been much worse if these countries had entered the crisis with shorter debt maturity (figure 1.3).

Currency composition matters because the revenues of the government are usually denominated in domestic currency. If debt is denominated in foreign currency, the government can be exposed to exchange-rate risk: for example, real exchange-rate depreciation would make it more difficult for the government to meet its intertemporal budget constraint, since the debt stock would increase without a commensurate increase in its revenues. A second and perhaps more important reason (which may explain some of the features of the recent crisis in the euro area) is that if debt is denominated in a currency that the government cannot print through its central bank, the government paper market will not benefit from the existence of a lender of last resort, in case doubts arise about the government's ability to service its debt (see below).

The characteristics of the investor base are relevant because they affect the stability of the investment decision and hence the likelihood that a rollover crisis arises. In this respect, several considerations are relevant:

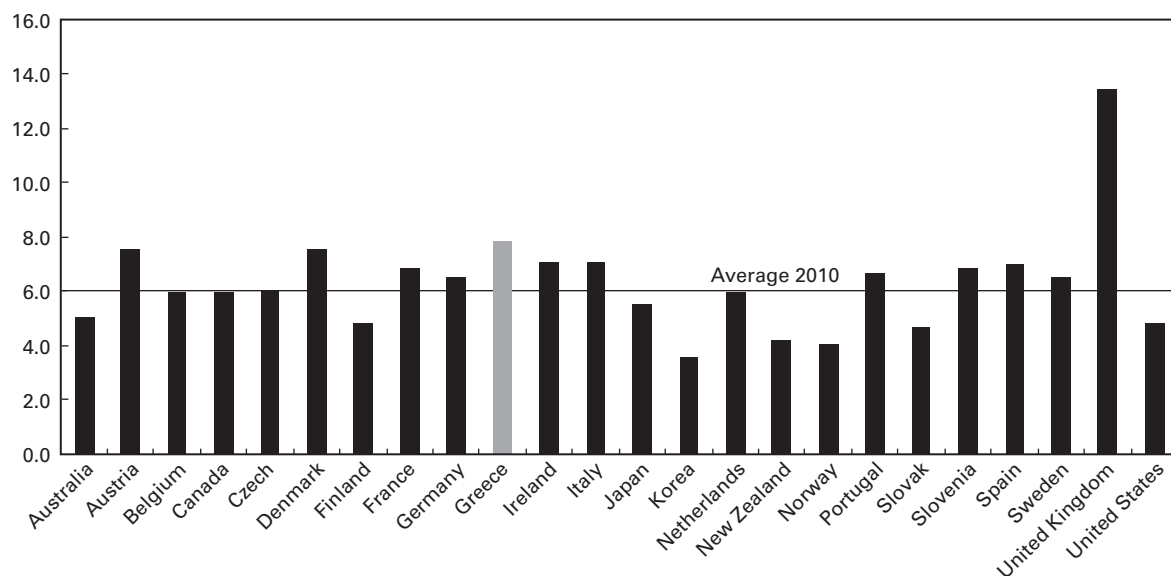


Figure 1.3

Maturity of government debt, August 2010 (years)

Sources: Bloomberg; IMF, *Fiscal Monitor*, November 2010

- The first is the split between domestic and foreign residents. Domestic residents are perceived to be less volatile, which can be explained by home bias effects (including moral suasion) and by the fact that defaulting on government debt is much less attractive if debt is held by residents (as noted above, default/restructuring is also a tax). This can be a decisive factor and is probably the key reason why interest rates on Japanese government paper are relatively low despite very high deficit and debt ratios.
- Financial repression can greatly enhance the stability of the investor base and thus lower governments' borrowing costs. This is a key reason why many developing economies benefit from low real interest rates and are thus able to have favorable debt dynamics with weak primary balances (chapter 4).
- Institutional investors (like insurance companies) are also perceived to be less volatile.
- The presence of foreign official investors can lower the perception of risk under certain conditions. Official lending is likely to be less affected by the vagaries of market sentiment, but it may be affected by political considerations. An additional consideration is whether official lending receives a preferred creditor status with respect to ordinary investors. If it does, an increase in the share of official lending could reduce the likelihood of a crisis but does increase the cost for

the private sector of a crisis if that occurs. Increased recognition of this effect, for example, the restructuring of Greek debt in 2011, has reduced the beneficial effect of official lending in the most recent period.

- Foreign central banks play a special role. If a currency has achieved “reserve currency” status, foreign central banks will invest in it. This will increase the investor base and can greatly lower the cost of borrowing. This is indeed one key reason why interest rates in the United States remain so low despite the weakening in their fiscal accounts in recent years: the share of US Treasury paper held by foreign central banks has reached about one-third in 2012 (against about one-fifth at the end of the 1990s).
- Finally, the presence in the market of the central bank can significantly lower the borrowing costs for the government, as long as this does not affect inflation expectations. As discussed in Cottarelli and Jaramillo (2012), this occurs for two reasons. First, there is a direct quantitative effect: the larger the share of central bank purchases, the lower is the amount of debt that needs to be sold outside the public sector. Second, there is a key liquidity effect: the presence of the central bank ensures that a rollover crisis cannot happen, since the central bank has inexhaustible resources to repay government debt coming due. The catch, of course, is that if the presence of the central bank leads to a loss of confidence in the value of the currency, nominal interest rates would start reflecting not only a higher inflation expectation but also an inflation/devaluation risk premium, which can be quite high. So it is critical that the use of the printing press does not lead to a higher inflation expectation. In the context of a surge in demand for liquidity after 2009, these conditions have been met and the financing of increased amounts of government debt since then has been greatly facilitated by the intervention of central banks in the government paper market (as in the United Kingdom and the United States).

1.4 Fiscal Risks

The second risk area concerns possible sources of shocks to the baseline. I focus explicitly on three sources of shocks: shocks from contingent liabilities (particularly those arising from the financial sector), macroeconomic shocks, and policy shocks.

1.4.1 Shocks from Contingent Liabilities

Traditionally, fiscal analysis has focused on contingent liabilities arising from contractual obligations of governments, such as public-private partnerships. But it is now clear that noncontractual commitments are also critical. And those arising from the financial sector can have devastating effects on the fiscal accounts, as was seen during the recent crisis. The direct support to the financial system provided by the

eight countries most affected by the financial crisis ranges from 3 percent of GDP in the United States to 38 percent of GDP in Ireland, after taking into account the recovery (so far) of what was initially injected. The range is very large, as a result of a number of factors discussed in chapter 14.

1.4.2 Macroeconomic Shocks

The second source of shock relates to macroeconomic assumptions, particularly growth, interest-rate, and exchange-rate assumptions. These shocks can operate by affecting revenues and spending, or by affecting the value of government assets and liabilities. Long-lasting shocks are, of course, more relevant. As discussed, growth is especially important because it affects not only the debt-to-GDP dynamics, given a certain primary balance, but also the primary balance, given certain policy settings.

The traditional approach followed in this area is to look at fan charts describing how certain fiscal variables, such as the debt-to-GDP ratio, are affected by shocks. These shocks are typically distributed around a baseline assumed to be unbiased, with the magnitude of the fan charts reflecting the volatility of shocks around past regression lines. However, in assessing forward-looking risks, it is also important to keep in mind that the baseline may be biased. Here it is worth mentioning two factors that are particularly important in assessing current medium-term fiscal projections (as discussed in chapter 16).

The first is that current IMF (as well as consensus) baseline projections are based on the assumption that the crisis led to a major loss of potential output that is not going to be recovered even in the medium term. Figure 1.4 reports the *World Eco-*

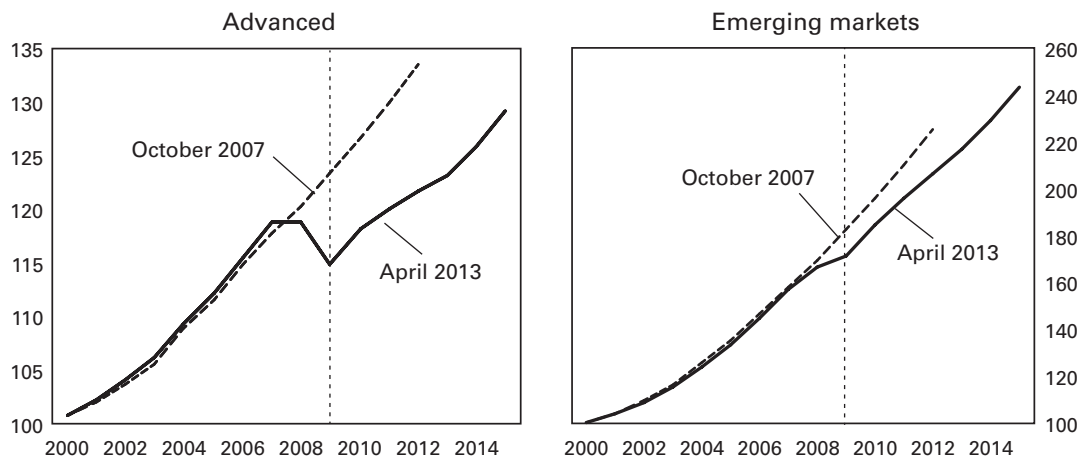


Figure 1.4
Real GDP in advanced and emerging economies.
Sources: IMF, *World Economic Outlook*, October 2007 and April 2013

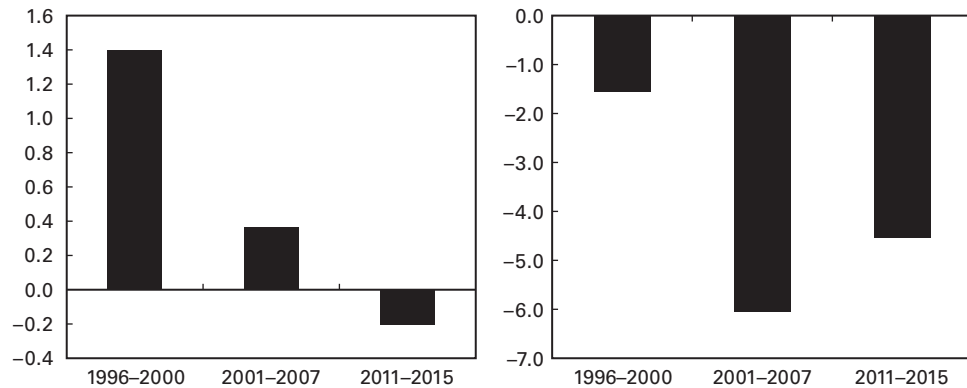


Figure 1.5

Interest-rate-growth differential (in percent)

Sources: IMF, *Fiscal Monitor*, November 2010; IMF staff estimates

conomic Outlook (WEO) projections for advanced and emerging economies before the crisis. These are compared with the fall 2010 WEO projections: output levels never catch up with the original baseline. The corresponding revenue loss for advanced economies equals about 3 percentage points of GDP, a huge amount. This output projection is based on the experience of the previous financial crisis, but there were exceptions in the past. With this evidence some commentators have argued that particularly with respect to the United States, the current concerns about fiscal prospects are much too pessimistic: the fiscal deficits were caused by the economic crisis and will go away when the crisis is over.

The second factor relates to possible overoptimism on baseline interest rate projections. In the fall 2012 WEO projections, the interest-rate-growth differential in the coming five years is quite low by historical standards, indeed negative on average (figure 1.5). This is possible in a period of still low growth and ample liquidity provided by the central bank to financial sector markets (and, for some countries, directly to the government paper market, as discussed above). But, at the same time, the debt stock has increased rapidly for advanced economies since 2007, and this will over time put pressure on interest rates.

The interest-rate-growth differential is also a source of uncertainty for emerging economies. The favorable fiscal outlook for these countries discussed in chapter 16 is premised on the continuation of a largely negative differential. As discussed above, there is an economic puzzle here. Economic theory tells us that this differential cannot be negative for a long time because, otherwise, agents could borrow and invest more, financing the capital accumulation with increased income later (which should drive up interest rates). And yet the differential has been negative, on average, for

emerging economies for decades. This issue and its political implications are discussed in chapter 3.

1.4.3 Fiscal Policy Shocks

The third kind of shock relates to fiscal policy itself, namely to the possibility that policies deviate from those underlying the baseline. The traditional approach in discussing this risk is to rely on estimates of fiscal policy reaction functions and to use the residuals of such estimates to assess the risks of significant deviations from the projected baseline. However, this is where it is important to take into account also the possibility that changes in fiscal institutions affect the way policies are implemented.

Strengthening of budgetary institutions, introducing fiscal rules, and setting up independent fiscal councils to monitor fiscal developments can reduce the risk of deviations of policies from initial policy announcement (e.g., see Debrun et al. 2009, and chapter 18). In the same vein, credible reporting of fiscal data is essential: the ex post discovery that earlier fiscal reporting was incorrect can damage credibility and results in higher interest rates (for more details, see IMF 2012b), as evidenced by the recent experience of some euro area countries (particularly Greece). Country-specific political shocks are also critical in assessing the likelihood of possible changes in the fiscal policy course reflected in the baseline, and they may affect market perceptions of debt sustainability quite sharply. Last, but definitely not least, good communication of policy intentions is critical in affecting market perception of policy risk. Many of the problems that have emerged in the last few years, for individual countries and the whole euro area, have reflected difficulties in presenting policy intentions in a convincing way.

1.5 Other Risk Dimensions

The last risk area includes risk dimensions that are not directly fiscal but can affect indirectly the perceived risk in investing in government paper.

1.5.1 Nonfiscal Fundamentals

It is now apparent that the likelihood of a fiscal crisis also depends not only on the public sector balance sheet but also on the overall conditions of the economy, including the availability of overall saving to finance it, the growth rate of the economy, and the likelihood of spillovers from the rest of the economy to the public sector via contingent liabilities.

Two additional channels are worth discussing. The first relates to the magnitude of private-sector debt. There seems to be growing consensus that high levels of pri-

vate debt increase the risk of speculative attack against government paper. This could be due not only to the fact that high private debt can lead to contingent liabilities for the government but also to the possibility that a private-sector debt crisis leads to lower growth and to an increase of country risk with inevitable spillovers for the public sector.

The second relates to the existence of an external imbalance: countries facing twin deficits are more likely to suffer speculative attacks, which could also lead to a run out of government paper. The reason could be that an external imbalance signals an overvalued exchange rate, and real exchange-rate depreciation would make it more difficult to service external debt. This happens regardless of whether the equilibrium is restored through a nominal depreciation or through an internal devaluation: in the case of a nominal depreciation, the public debt-to-GDP ratio increases as the exchange rate is depreciated without a commensurate improvement in the primary balance. In the case of an internal devaluation, the debt ratio also increases because the GDP deflator declines. Again, the experience of some euro area countries with sizable external imbalances in the last few years illustrates how markets are sensitive to this issue.

1.5.2 Risk Appetite

The last dimension of risk is essentially what we could call general (i.e., not fiscal specific) market sentiment or risk appetite. Given all other variables that we have discussed, and risks surrounding these variables, a higher propensity by markets to take up risk reduces the likelihood of a crisis in all countries. This is tricky, though, as, with respect to a *worsening* in risk appetite, we need to distinguish between two groups of countries. On the one hand, there are those that are considered as safe havens. These are countries where the risk of a crisis is, for whatever reason, regarded as low and that may therefore attract investments in government paper from other countries. In the recent past this effect has benefited the US and German government paper markets. Other countries would, to varying degree, suffer from these outflows. The overall result is that cross-country differences in risk perception—as signaled by interest-rate differentials—would deepen when overall risk appetite weakens. More work is needed to evaluate what makes a country a “safe haven.” It seems that some underlying strength based on the evaluation of the risk factors discussed above is what gives a country a safe haven status and makes it easier to finance its deficit, particularly at times of low risk appetite. But one point seems clear, namely that the status of safe haven is not something that is cast in bronze and countries cannot abuse it in the long run by exploiting their possibility to borrow at low rates: countries benefit from this status as long as they do not abuse it.

1.6 Conclusions

The discussion above confirms the complexity of the factors affecting the perception of rollover risks and explains why it is often difficult to draw conclusions based on a limited number of indicators. In principle, the various risk dimensions could be quantified and overall risk developments could be followed through like a “cobweb” expanding within the risk octagon. This said, several caveats need to be considered in applying that framework, especially if one intends to move from a multidimension approach to a single summary indicator of risk.

First, the risk dimensions are not independent from each other, including with respect to fiscal policy decisions. For example, a weakening in the fiscal baseline can reflect the expected materialization of some risks, and therefore be accompanied by an improvement in some risk dimensions, and vice versa. Second, various elements of risks could move in the same direction: for example, a weakening of market sentiment can lead not only to a weakening in the corresponding dimension but also to a reduction in maturity composition, and hence a weakening in the asset and liability management dimension.

Second, further work is needed to assess the relative importance of the various dimensions. This will not be easy: econometric regressions require necessarily parsimonious specifications. Yet it would be important to identify more precisely the relative contributions of the various factors described by the octagon, a necessary step to summarize the risk assessment with a single indicator.

The third caveat relates to the policy implications of any work on rollover risk. Reducing rollover risk is not the only thing that matters in shaping fiscal policies. Otherwise, it would be sufficient to aim at the lowest degree of risk. Things are more complicated in reality as fiscal policy has its own ends: to provide public services, for example, while avoiding excessively distortionary taxation. Fiscal policy should also play a role in reducing output fluctuations, typically through automatic stabilizers but, in some cases, also through countercyclical policies. Always aiming at reducing fiscal deficit is unlikely to be optimal.

This is indeed at the core of the policy debate on how fiscal policy should be handled currently, especially in advanced countries (the so-called austerity debate), something that we will return to in the last chapter of this book.

Notes

1. The term “liquid” includes two dimensions: one is the depth of the government paper market (i.e., the fact that the market has a sufficient size so that the sale of government paper for individual investors can easily be absorbed); the second has to do with the conditions in the monetary base market, as already noted. One important consideration to bear in mind is that the assessment of rollover risks in terms of solvency, which is followed in the text, focuses on the markets’ *perception* of solvency. Situations may arise where the

market perceives the government to be insolvent as a result of an excessively pessimistic assessment of the fiscal outlook. In such a situation interest rates may end up being higher than their “fundamental” value. One can refer to this situation as one of “illiquidity” for the government rather than of “insolvency.” However, in a way, this is just semantics: “multiple equilibria” situations can arise where, in the bad equilibrium, illiquidity problems turn into solvency problems. It is in this case that the availability of a lender of last resort, like the IMF or the central bank, becomes particularly important to avoid unwarranted increases in interest rates that would not be sustainable over time.

2. The concept of fiscal solvency needs also to be contrasted with the concept of fiscal sustainability. The term “fiscal sustainability” refers to the possibility of sustaining over time the same fiscal policy stance—that is, the fiscal policy parameters affecting fiscal outcomes—without incurring fiscal solvency problems. A country can be solvent even if the fiscal stance is not sustainable because markets expect that the policy stance would at one point be changed. Fiscal unsustainability should not be confused with debt unsustainability: debt unsustainability arises as a particular case of fiscal unsustainability, that is, when restoring fiscal sustainability requires some form of debt restructuring rather than an adjustment in other fiscal policy parameters (see “Modernizing the framework for fiscal policy and public debt sustainability analysis,” International Monetary Fund, paper prepared by the Fiscal Affairs Department and the Strategy, Policy, and Review Department, August 5, 2011).

3. The analysis can be (and often is, for simplicity) conducted also in terms of gross debt, in which case the primary balance has to be defined as total revenues minus non-interest spending.

4. One digression is needed to discuss the case of countries with a negative interest-rate–growth differential, which is common in emerging economies. A negative differential allows countries to stabilize, or even lower, their debt ratio while running negative primary balances. Moreover the standard prescription for debt stabilization—the primary balance should be larger, the higher is the debt level—does not hold if the differential is negative: stabilizing the debt ratio requires a weaker (more negative) primary balance the higher the debt level (and, for a dynamic perspective, the debt will eventually stabilize for any negative primary balance). This said, a negative differential is inconsistent with efficiency considerations, and it is unlikely to persist over the longer run (particularly in the absence of financial repression), and particularly if the debt ratio starts rising, limiting the possibility of abuse of the negativity of the interest-rate–growth differential. The differential, while often negative on average, has indeed been more volatile in emerging economies than in advanced ones (Escolano, Shabudina, and Woo 2011). Thus, even for a negative differential, the primary balance remains an important indicator of the health of public finances, including their ability to withstand shocks to the differential.

5. If the interest rate on assets differs from the interest rate on liabilities, this formula no longer applies. Note also that the term debt here includes also the liabilities of the government toward the central bank. If the balance sheets of the government and the central bank are consolidated, a term including base money would also appear in this relationship as distinct from other debt (base money is not debt in the sense that it does not require servicing).

6. The term “fiscal risks” is often used to indicate the risk of a fiscal crisis. In line with the public financial management literature, the term is here instead used in the meaning indicated in the text.

7. For example, in the United States, the ten-year nominal bond yield at the end of 2011 was 1.875 percent, whereas the yield of the ten-year inflation-indexed bond was -0.12

percent. For Japan, the corresponding rates for the seven-year bonds at end 2011 were 0.55 and 0.78 percent, respectively (source: Bloomberg, LP).

8. A host of other factors are, of course, important in affecting long-term fiscal trends, such as increased spending needs to fight global warming, or the potential erosion in revenues arising from increased tax competition.

9. Of course, the growth of the economy is also important for fiscal sustainability because it enters directly the debt-stability equation.

10. This said, debt restructuring also involves a correction in the “primary balance”: from an economic perspective it involves a tax on bond-holders, and if that tax were classified as such, the primary balance in the year of debt restructuring would surge to very high levels, with contractionary effects on the economy, whose effects would depend, among other things, on the distribution of bonds between domestic and foreign holders.

11. Formal tests of debt sustainability, following Bohn (1998) indeed rest on testing whether, based on history, the primary balance was adjusted in response to increases in the stock of debt. One difficulty in applying this approach to current circumstances is that many countries never had a public debt ratio as high as the current one and therefore the past may be an untrustworthy guide, given the possibility of nonlinearities in the relationship between public debt and the desired primary balance.

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