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Strategies for Fiscal Consolidation in the Post-Crisis World

Prepared by the Fiscal Affairs Department¹

(In consultation with other Departments)

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EXECUTIVE SUMMARY

The crisis and associated increases in fiscal deficits and government debts have resulted in a daunting fiscal challenge, especially for advanced economies. Under current projections, government debt in the advanced economies will rise, on average, by about 35 percentage points of GDP between 2007 and 2014; primary deficits would remain sizable even as the output gap closes. Large scale fiscal adjustment will be required, when the recovery is securely underway.

To help anchor fiscal solvency expectations, credible fiscal exit strategies aimed at reducing government debt to prudent levels need to be designed and communicated now. In designing such strategies, policymakers need to decide whether to stabilize debt ratios at current high levels, or bring debt ratios down significantly. Stabilizing debt ratios at post-crisis levels would be easier, but would likely lead to higher real interest rates and lower medium-term economic growth, and would compromise the ability of fiscal policy to respond to future crises.

Achieving and maintaining prudent debt levels will require a major and sustained fiscal adjustment. To illustrate, for the advanced economies, attaining a debt ratio of 60 percent by 2030 would require the structural primary balance to improve by 8 percentage points of GDP, on average, during 2011–2020 (i.e., a fiscal effort of $\frac{3}{4}$ percentage points per year) and to remain constant for the following decade. This fiscal consolidation will be challenging, but historical precedents exist for several countries. The scale and composition of adjustment will need to be tailored to the specific conditions of individual countries.

Most of the adjustment will have to stem from fiscal structural reforms. Letting the fiscal stimulus expire should be straightforward from a technical standpoint, because much of the stimulus has consisted of temporary measures. However, this will be only a first step to ensure government debt trends consistent with fiscal sustainability. The bulk of the adjustment will require more difficult reforms to improve the structural primary balance. These would likely include, for example: (i) reforms aimed at stabilizing entitlement-spending-to-GDP (a challenge, in light of the strength of demographic trends); (ii) measures to lower other primary spending in relation to GDP; and (iii) increased revenue, which in many countries will need to be part of the solution, through broadening of tax bases but also tax rate hikes, depending on country circumstances.

Strengthened fiscal institutions can play a key role in support of fiscal consolidation. Most countries, in varying degrees, need to strengthen the formulation and implementation of fiscal frameworks, fiscal monitoring and reporting, budgeting practices, and government assets and liabilities management.

Some reforms should be initiated now. The timing of implementation of fiscal adjustment strategies will have to take into account output developments. This said, some policy measures can be undertaken now, even in countries where the recovery is not yet securely underway. These include institutional fiscal reforms and reforms with long-term effects on spending and revenues, but not placing the recovery at risk.

I. INTRODUCTION

1. **The global economic crisis has resulted in the largest worsening of the fiscal accounts since the Second World War.** In response to the crisis, government budgets have provided substantial support for aggregate demand and for the financial and other key sectors. In the process, fiscal balances have deteriorated, government liabilities expanded, and risks of future losses increased.
2. **While this fiscal activism has cushioned the adverse effects of the crisis, it is now necessary to articulate a strategy to ensure the sustainability of the public finances.** It is too early to exit from crisis-response policies: despite some evidence of improvement, prospects for the global economy remain uncertain. However, it is vital to ensure that markets remain confident that governments have a strategy to move their budgetary and balance sheet positions to a situation of normalcy. Failure to do so would destabilize expectations, raise borrowing costs, and weaken the effect of the fiscal and monetary support now being provided.
3. **This paper discusses the scale and composition of fiscal adjustment that will need to occur once the recovery is securely under way.** The analysis shows that the fiscal challenge is daunting, particularly in advanced economies, but also that historical precedents exist for overcoming it: a set of ambitious but attainable policies can be identified to deliver the required adjustment. Letting fiscal stimulus measures expire will only be a first and relatively minor step. Indeed, a large and sustained improvement in primary structural balances will be necessary in many advanced economies. Although specific circumstances at the country level, including societal preferences, will shape the composition of adjustment and its political feasibility, in many cases restoring fiscal sustainability will require not only addressing with greater vigor pre-existing long-run challenges in health and pensions, but also undertaking reforms to reduce other spending and increase tax revenue as a share of output. Specific expenditure rationalization and revenue enhancing measures that would need to be considered will be covered in a separate paper, under preparation.

II. A DAUNTING FISCAL CHALLENGE

4. **The crisis has resulted in a major increase in fiscal deficits and government debts in advanced economies.** Under current projections, which already assume some tightening mainly through the removal of fiscal stimulus measures beginning in 2011 for several advanced economies, the general government gross debt-to-GDP ratio (henceforth “debt ratio”) of advanced economies will rise from 73 percent at end-2007 to 109 percent at end-2014, with most of the increase up front (Figure 1). By 2014, debt ratios will be close to or exceed 85 percent in all G-7 economies, except Canada. Reversing this debt buildup will be a daunting fiscal challenge:
 - The scale of the problem is unprecedented in peacetime. Indeed, government debts in the G-7 countries are now as high as they were in the early 1950, i.e., in the

immediate aftermath of the Second World War (Figure 2). Major government debt increases occurred in the 1930s, but starting from lower levels (e.g., U.S. federal government debt was 16 percent of GDP in the late 1920s). Moreover, while demographic trends were favorable in the 1930s, they are unfavorable now: fiscal pressures from an aging population will add significantly to the fiscal challenge of advanced economies over the next decades.

- The fiscal problem will improve only in part with the economic recovery. By 2014, the output gap is projected to be close to zero. Yet, primary deficits, while declining, will remain sizable even assuming (as in the baseline projection) that the 2009-10 stimulus measures are not renewed and that other temporary measures expire. This is because: (i) even before the crisis, structural primary balances were weak; (ii) in some countries, there has been an underlying increase in spending unrelated to the crisis; and (iii) some revenue losses (those related to a step decline in potential output and lower tax payments from the financial sector) are expected to be long-lasting, if not permanent.
- The higher level of debt will need to be serviced in the years to come: by 2014, taking into account the likely rise in interest rates from currently low levels, debt service costs are projected to increase by some 1¾ percentage points of GDP over 2007. The increase in debt ratios reflects mostly large above-the-line deficits, rather than the acquisition of financial assets (financial support operations could perhaps account for 3 percentage points of the about 35 points projected increase in average debt ratios by 2014). Thus, the sale of assets acquired during the crisis could only give a relatively modest contribution to lowering gross debt in the years ahead.

5. **The fiscal outlook is significantly stronger for emerging economies, but is not without risks.** Debt ratios in emerging economies are projected to return to pre-crisis levels by 2013. This better outlook reflects more favorable structural primary balances during the crisis and smaller output losses (Fiscal Affairs Department, 2009a). In addition, fiscal policy in several emerging economies is projected to begin a tightening cycle in 2010, reflecting some consolidation beyond the simple withdrawal of crisis-related stimulus, supported by stronger growth prospects (Fiscal Affairs Department, 2009b).

6. **In developing countries, risks to debt sustainability, which had improved substantially in recent years, may be again on the rise.** Prior to the crisis, debt ratios in these countries had declined as a result of fiscal consolidation, strong growth, and debt relief. However, this decline came to a halt in 2009, and debt ratios are projected to remain broadly stable into the medium term. More than one-third of developing countries have augmented automatic stabilizers with discretionary fiscal stimulus, particularly on the spending side. Although several developing countries have used the buffers built in before the crisis, debt ratios in some cases are expected to rise markedly in the years to come, if fiscal retrenchment or increased levels of highly concessional donor support fail to

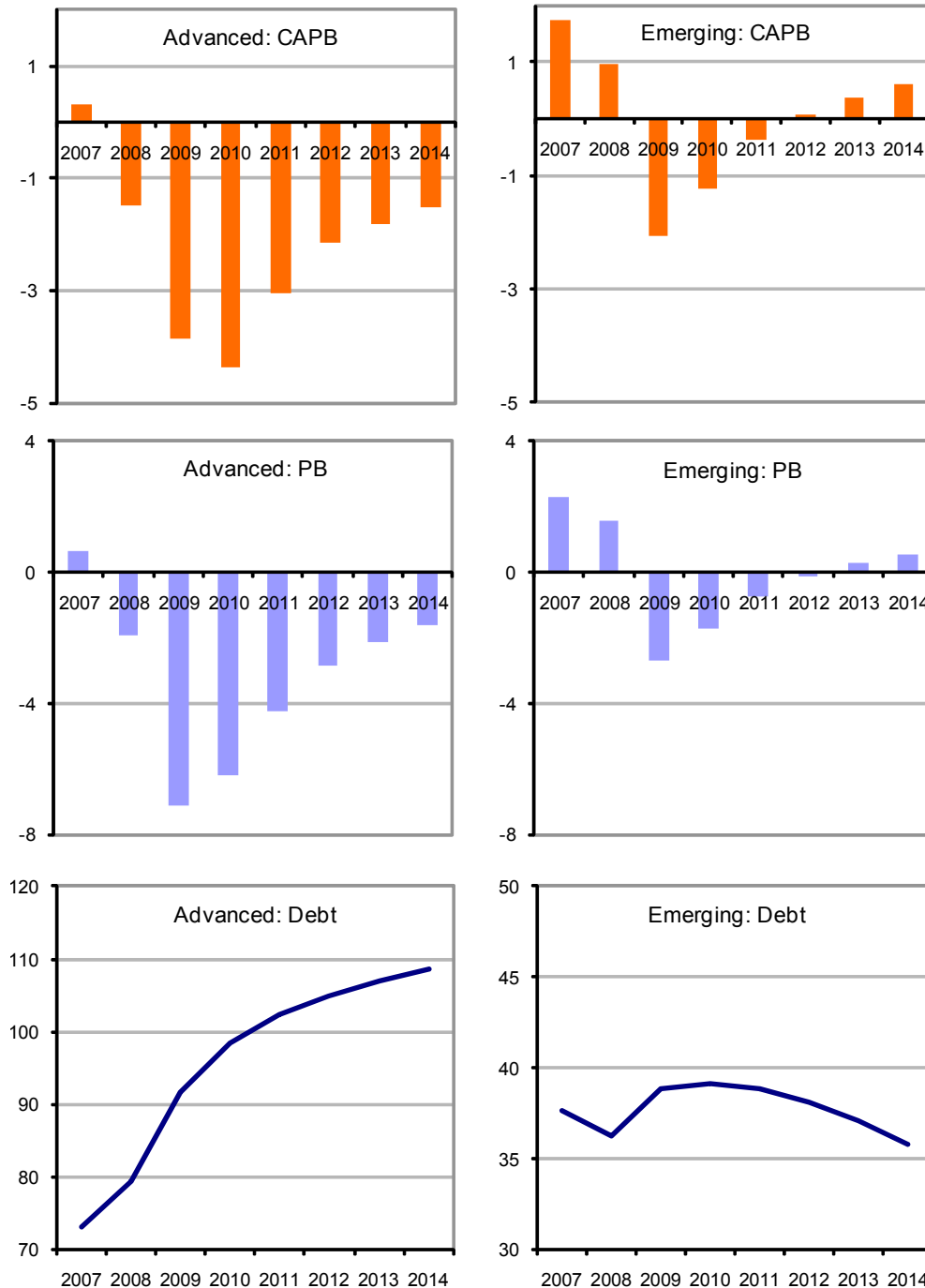
materialize. Thus, the risk of debt distress could increase in some developing countries, especially in the absence of fiscal adjustment once the recovery is clearly on the move.²

7. **Altogether, the fiscal outlook is weaker in advanced economies, but their problems could spill over to other countries.** At best, higher deficits and debt will put upward pressure on real interest rates, weakening growth prospects in advanced economies and elsewhere (see also the discussion in section III). At worst, the weaker fiscal outlook in advanced economies could lead to concerns that debts will be “inflated away” or that default is inevitable. If so, debt maturities would shorten, risk premia rise and, ultimately, refinancing crises could emerge. Indeed, as the recent crisis has demonstrated, a loss of confidence in the advanced countries could spill over to emerging and developing economies with weaker fundamentals. Perhaps those with stronger fundamentals could benefit from a “flight to safety,” an effect attenuated by appreciation in their currencies, which would reduce their competitiveness. In any case, shifts in investments across and out of advanced economies could disrupt financial markets. Moreover, a fiscal crisis could be more severe than a crisis rooted in the private sector, because no entity would be available to bail out the public sector.

8. **At present, financial markets do not seem to be too concerned about the weaker fiscal outlook, but this should not be an excuse for complacency.** While some indicators of risk premia point in the direction of increased differentiation across sovereigns (Figure 3), markets have not yet reacted more forcefully to the fiscal challenges of high-debt advanced economies. This may reflect myopia: recent experience has shown that markets often react late and suddenly to persistent disequilibria. A more favorable interpretation is that markets’ contained reaction may reflect an increased supply of private savings or expectation that policy makers will eventually embark on credible fiscal adjustment. In any event, clarifying the fiscal adjustment strategy would reduce the likelihood of a sudden deterioration in market sentiment.

² The impact of the global crisis on developing countries as well as their policy reactions and challenges have been recently discussed in “The Implications of the Global Financial Crisis for Low Income Countries—An Update” (IMF, 2009a).

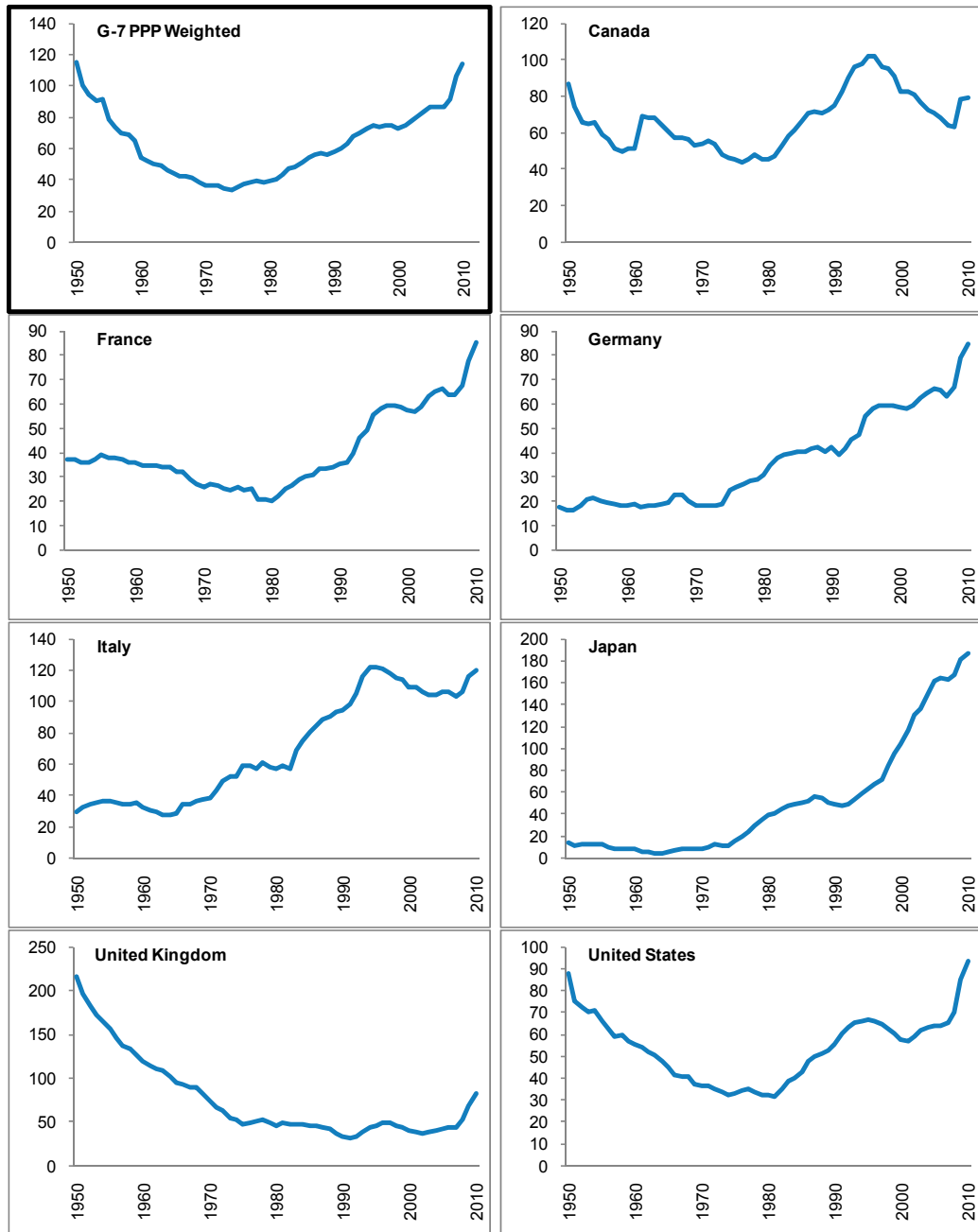
Figure 1. Advanced and Emerging Economies: Cyclically Adjusted Primary Balance (CAPB), Primary Balance (PB), and Government Debt, 2007–14
(in percent of GDP)



Sources: IMF, World Economic Outlook, January 2010, where available; otherwise October 2009; and Fund staff estimates.

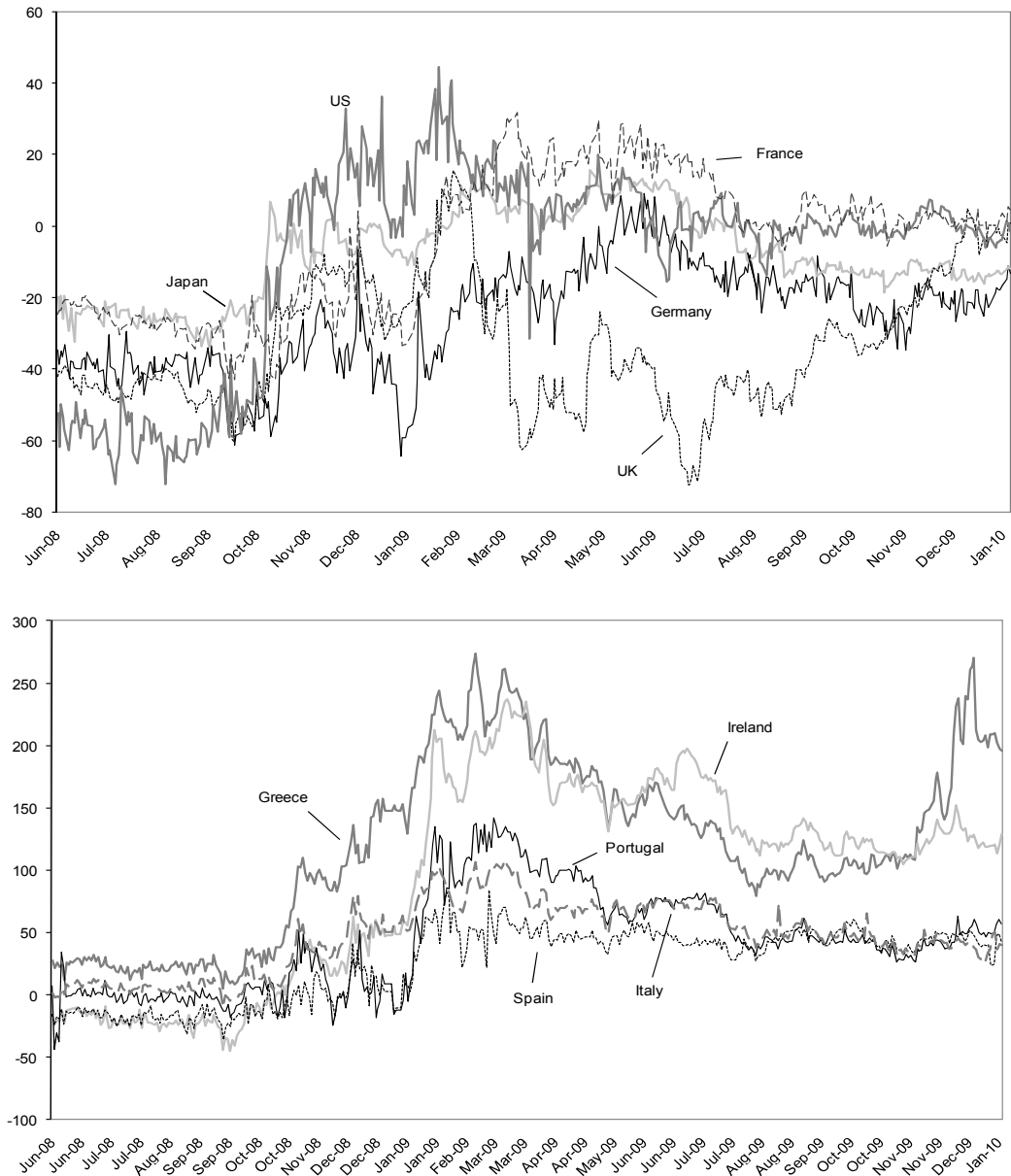
Notes: To focus on fiscal measures with direct effect on demand, the cyclically-adjusted primary balance (top panel) for the U.S. excludes losses from financial sector support measures as well as other one-off and temporary factors (estimated at 3.1 percent of GDP in 2009 and 0.3 percent of GDP in 2010). However, to capture the effects of these losses on debt dynamics, the figure also displays the primary balance including the costs of financial sector support measures (middle panel).

Figure 2. Government Debt in G-7 Countries, 1950-2010
(in percent of GDP)



Sources: The data are drawn mainly from the IMF's World Economic Outlook database (2009 and 2010 are projections). They refer to the general government, except for Japan (Central Government). WEO data are supplemented by the following: *Canada* (1950-60) - Federal Gross Government Debt (Haver Analytics); *France* (1950-77) - National Debt (Goodhart, 2002); *Germany* (1950-75) - Credit Market Debt and Loans (Statistisches Bundesamt Deutschland); *Italy* (1950-78) - National Government Debt (Banca D'Italia); *Japan* - Central Government Debt (Ministry of Finance of Japan); *United Kingdom* (1950-79) - National Debt (Goodhart, 1999); *United States* - Gross Federal Debt (Office of Management and Budget; and U.S. Census Bureau).

Figure 3. Relative Asset Swap (RAS) Spreads in Selected Advanced Economies (in basis points)



Source: Datastream

III. FISCAL EXIT STRATEGIES

9. **Announcing a credible fiscal exit strategy can help maintain public confidence in fiscal solvency.** Loosely speaking, fiscal solvency requires the government to be able to

repay its debt obligations through future primary surpluses.³ Thus, as long as the government is able and willing to run future surpluses of sufficient size, a surge in debt would be consistent with fiscal solvency.⁴ However, a critical element is the credibility of the government's commitment to run the required primary surpluses: if confidence in this commitment is shaken, the ensuing rise in risk premia would drive up interest rates and worsen debt dynamics even further. And if the government is unable to restore confidence, this could lead to snowballing effects where each increase in interest rates in turn undermines public confidence in fiscal solvency, ultimately making default inevitable. Snowballing effects may arise not only as a result of high deficits and debts, but also from the perception of a regime change toward a more relaxed attitude vis-à-vis fiscal solvency. A credible strategy is thus an important instrument for anchoring fiscal solvency expectations.

A. What Should the Fiscal Exit Strategy Aim For?

10. **In designing a fiscal exit strategy a critical decision relates to the debt ratio target.** It is obvious to all that an ever increasing debt ratio is not sustainable. A key choice, however, is whether government debt ratios should be stabilized at (higher) post-crisis levels or whether should be brought down to more prudent levels. This has substantial implications for the magnitude of the needed primary adjustment, as will be indicated below.

11. **There are strong reasons why aiming at stabilizing debt ratios at post-crisis levels would be insufficient:**

- While many individual countries have 'lived' with high debt for sustained periods of time, the challenge in the current situation lies in the number of advanced economies that would join their rank. Whereas in 2007 only three advanced economies had debt ratios near or above 100 percent, by 2014 this number would expand to eight, accounting for the bulk of economic activity in this group (Figure 4). The effects this may have on the world economy are unknown, because such a situation is unprecedented in peacetime. A sizable increase in real interest rates worldwide is a distinct possibility.⁵ Ultimately, potential growth may suffer.

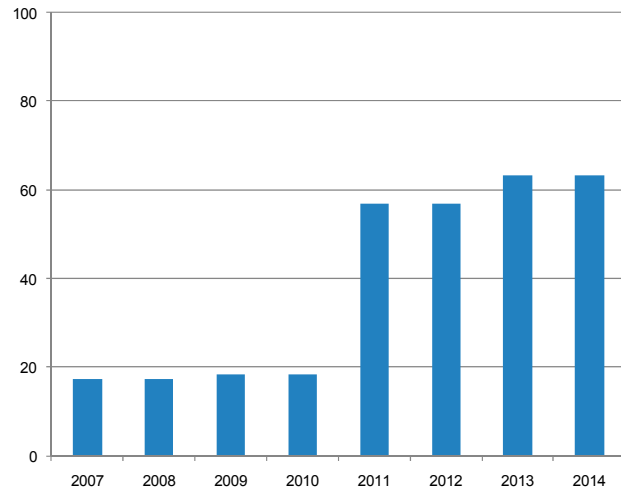
³ More technically, fiscal solvency requires that the value of outstanding government liabilities equals the expected present value of primary fiscal surpluses inclusive of seigniorage revenue.

⁴ For a technical presentation of the inter-temporal budget constraint, see Appendix IVb in "Fiscal Rules: Anchoring Expectations for Sustainable Public Finances" (IMF, 2009b).

⁵ Staff have recently estimated that an increase in government debt by one percentage point of GDP leads government bond yields to rise by 5 basis points. Thus, other things equal, an increase in government debt by 35 percentage points of GDP would translate into a rise in interest rates by about two percentage points (Fiscal Affairs Department, 2009b).

- High debt can negatively affect growth. Italy and Japan, the G-7 countries with the highest debt ratios prior to the crisis, have experienced slow growth for at least the past two decades, although high debt in turn may reflect slow growth (Box 1). For emerging markets, some empirical studies have found evidence of “debt overhang” effects that reduce growth. Preliminary econometric analysis by staff on a sample of advanced and emerging economies suggests a negative impact of the size of government debt on per capita GDP growth: a 10 percentage point increase in the debt ratio would lead to a slowdown in annual growth by 0.2 percentage points.

Figure 4. Economic Weight of Higher-Debt Advanced Economies
(Percent of Total Advanced Economies' GDP)



Sources: IMF, World Economic Outlook, January 2010, and Fund staff estimates

- Stabilizing debt ratios at high levels compromises the ability of fiscal policy to respond to future crisis. Indeed, in some countries (e.g., Italy) the response to the current crisis was constrained by high government debt.

12. **A preferable strategy would aim at reducing debt ratios to more prudent levels in the medium term.** The goal should be to present a comprehensive strategy aimed at lowering government debt over time to levels regarded as prudent and to keep debt at those levels during the following decades. A simultaneous fiscal consolidation in advanced economies might reduce aggregate demand in the near term but, on balance, any costs would be more than offset by sizable benefits. Indeed, debt reduction would help to keep interest rates in check, foster medium-and-long-term economic growth, and create space for a forceful fiscal response in the event of another crisis. For some countries, this will mean targeting a fiscal position that is stronger than before the crisis. To illustrate, for advanced economies, the scenarios developed below focus on reducing debt ratios by 2030 to below 60 percent (i.e., the median pre-crisis debt ratio for the G-20 advanced economies).

13. **For emerging economies, debt ratios that can be sustained are generally considered to be lower than those for advanced economies,** owing to factors such as lower and more volatile revenue bases, and less favorable debt composition (higher share of debt that is short-term, foreign currency denominated/indexed, or held by foreign residents). Indeed, cross-section regressions of international investor perceptions of a country's sovereign default risk on its debt ratio and share of domestic debt in the total suggest that countries which maintain a larger share of their liabilities relative to domestic creditors are more likely to command investor confidence and, hence, sustain high debts going forward

(Appendix I). In the illustration below for emerging countries, the 2030 debt ratio target is 40 percent (i.e., the median debt ratio for emerging economies in the three years preceding the recent global crisis).

B. Elements of a Fiscal Exit Strategy

14. **A comprehensive fiscal exit strategy should spell out the debt ratio objective and broad policies it envisages to underpin the fiscal adjustment path.** This section turns to the composition of fiscal adjustment: it first discusses why higher inflation should not be part of the solution, and subsequently outlines non-inflationary strategies. The focus is on advanced economies, where the main fiscal problems lie, but the case of emerging economies is also discussed.

The role of inflation

15. **Some commentators have suggested that higher inflation is a reasonable price to pay to reduce the real value of debt.** In fact, inflation can alleviate fiscal problems in two ways. First, even fully anticipated inflation raises seigniorage that can be used to pay down debt. However, given the relatively low levels of base money in most advanced economies, this channel is less significant than in earlier decades.⁶ Second, an unexpected rise in the inflation rate would reduce the real value of government debt, as medium- and long-term, non-indexed, domestic currency debt accounts for three-quarters of the total in advanced economies. However, long-term interest rates would probably rise with inflation, and any maturing debt would have to be refinanced at higher rates. To illustrate these effects, Table 1 reports the debt ratio that would prevail in 2014 for selected OECD countries if inflation over 2009–14 turned out to be on average 6 percent as opposed to 2 percent (as currently projected in the World Economic Outlook). In this case, the debt ratio in that country sample would average 86½ percent in 2014, or 8 percentage points less than in the baseline. This represents less than one-quarter of the projected increase in the debt ratio.

16. **Moreover, using high inflation for debt reduction would carry major costs and risks, which argue against including this option in the policy mix.** International experience has shown that high inflation gives rise to distortions in resource allocation, reduces economic growth, hurts the poor, creates social and political instability, is not easily contained when unleashed, and leads to substantial output costs to be brought down again. Also, debt maturity profiles and the cost of borrowing would be adversely affected for many years to come. These are key lessons of the 1970s for the advanced economies; the experience of emerging and developing economies with high inflation has been even worse.

⁶ Raising inflation by 5 percentage points would increase seigniorage by about ½ percentage point of GDP in the average of the G-7 countries, assuming that demand for base money does not decline when inflation rises.

The roles of primary balance adjustment and economic growth

17. **A strengthening in the primary surplus, rather than higher growth, was the main factor in the top ten largest reductions in debt ratios in advanced economies over the last three decades** (Table 2). Indeed, a decomposition of debt dynamics shows that the contribution of the differential between growth and interest rates was significant only in a few episodes of rapid growth catch-up (e.g., Ireland, Norway, and Spain).⁷ The effect of the growth-interest differential was more relevant in emerging economies: it was on par with that of primary surpluses when inflation remained below 10 percent, and three times as large when inflation was in double digits.

18. **However, coupled with expenditure moderation, strong economic growth can give a major contribution to lowering debt ratios, which suggests growth-raising structural reforms should be part of the strategy.** The decomposition above does not take into account that higher potential growth makes it easier to run primary surpluses. Higher growth raises revenues and, if these are not spent, the effect on debt dynamics can be powerful. For example, a one percentage point increase in growth for 10 years (holding spending constant and assuming a 40 percent tax rate) lowers government debt by 29 percentage points of GDP. Therefore, growth enhancing reforms—e.g., more competitive goods markets, removal of labor market and tax distortions—should be pursued with vigor, as they counteract the undesirable effects of population aging on growth and public spending.

19. **This said, fiscal consolidation strategies should be based on conservative growth assumptions.** Considerable uncertainty surrounding both the magnitude and timing of the effects of structural reforms on potential growth cautions against building a credible fiscal adjustment strategy primarily around an optimistic growth path.⁸ Any revenue “windfalls” from better than projected economic growth could then be saved to speed up the adjustment effort.

The size of the required primary balance adjustment

20. **The size of the primary adjustment depends on key assumptions regarding the debt ratio target, interest-growth rate differential, and the pace of adjustment.** For

⁷ This simple approach, however, underestimates the total effect of growth on fiscal consolidation, because it does not take into account that it is easier for governments to run stronger primary balances when growth is higher. Ongoing research by staff envisages disentangling more clearly the interaction between growth and fiscal consolidation.

⁸ Prudence is also required because studies of growth in the aftermath of financial crises show that only a small share of the deepest output loss is regained at the end of the decade following a crisis (Cerra and Saxena, 2008).

illustrative purposes, but consistent with the aforementioned objective of a credible fiscal exit strategy, the scenario below, focusing on advanced economies:

- Envisages the goal of lowering (gross) debt ratios to below 60 percent by 2030.⁹ As noted, while maximizing the recovery value of assets acquired during the crisis is important, this will not materially alter the medium-term outlook, as receipts are likely to be small relative to the size of the needed reduction in gross debt. Thus, for simplicity, the recovery value of assets is assumed to be zero.
- Assumes an interest-growth rate differential of one percentage point, which is broadly in line with the observed differential in high-debt advanced economies over the period 1990–2007.
- Considers an adjustment in the primary balance that begins in 2011 and lasts for ten years; the primary balance is maintained constant thereafter. Of course, the appropriate adjustment profile depends in part on the nature of the supporting measures. For example, early measures that affected long-term spending trends could allow a more gradual adjustment, as markets would feel reassured that fiscal sustainability has been addressed despite of a more gradual adjustment path in the near term.

21. **The improvement required in the structural primary balance in advanced economies to achieve a debt ratio target of 60 percent by 2030 amounts to 8 percentage points of GDP during 2011–2020, i.e., a fiscal effort of $\frac{3}{4}$ percentage point per year** (Table 3a, and Figure 5).¹⁰ That is, the average structural primary balance has to improve from a projected deficit of $4\frac{1}{3}$ percentage points of GDP in 2010 to a surplus of almost $3\frac{2}{3}$ percentage points in 2020. However, there is considerable diversity among countries, with fiscal consolidation needs ranging from just under $\frac{1}{2}$ percentage point of GDP for Switzerland to over 13 percentage points for Japan, Ireland and Greece; one-fifth of the advanced economies would face adjustment needs close to or larger than 10 percent of GDP, while in about two-thirds the adjustment would be smaller than 5 percent of GDP. This diversity is explained not only because initial debt ratios differ considerably but also because

⁹ Given the high level of Japan's government assets, the illustrative simulation utilizes an estimate of net government debt for Japan. Moreover, in light of its weaker initial primary balance position, the illustrative objective for Japan is to reduce its net government debt to 80 percent of GDP by 2030.

¹⁰ The European Commission (EC), for example, recommends that fiscal consolidation should start in the EU countries in 2011 at the latest, provided the recovery is strengthening and becomes self-sustaining. Also, the EC points out that, to lower debt ratios to below the 60 percent target in the Maastricht Treaty, a more ambitious adjustment path will be required in most EU countries than the SGP benchmark of $\frac{1}{2}$ percent of GDP per year, with required adjustments in excess of 1 percent of GDP for several years in Portugal, France, Spain, UK, and Ireland (European Commission, 2009a).

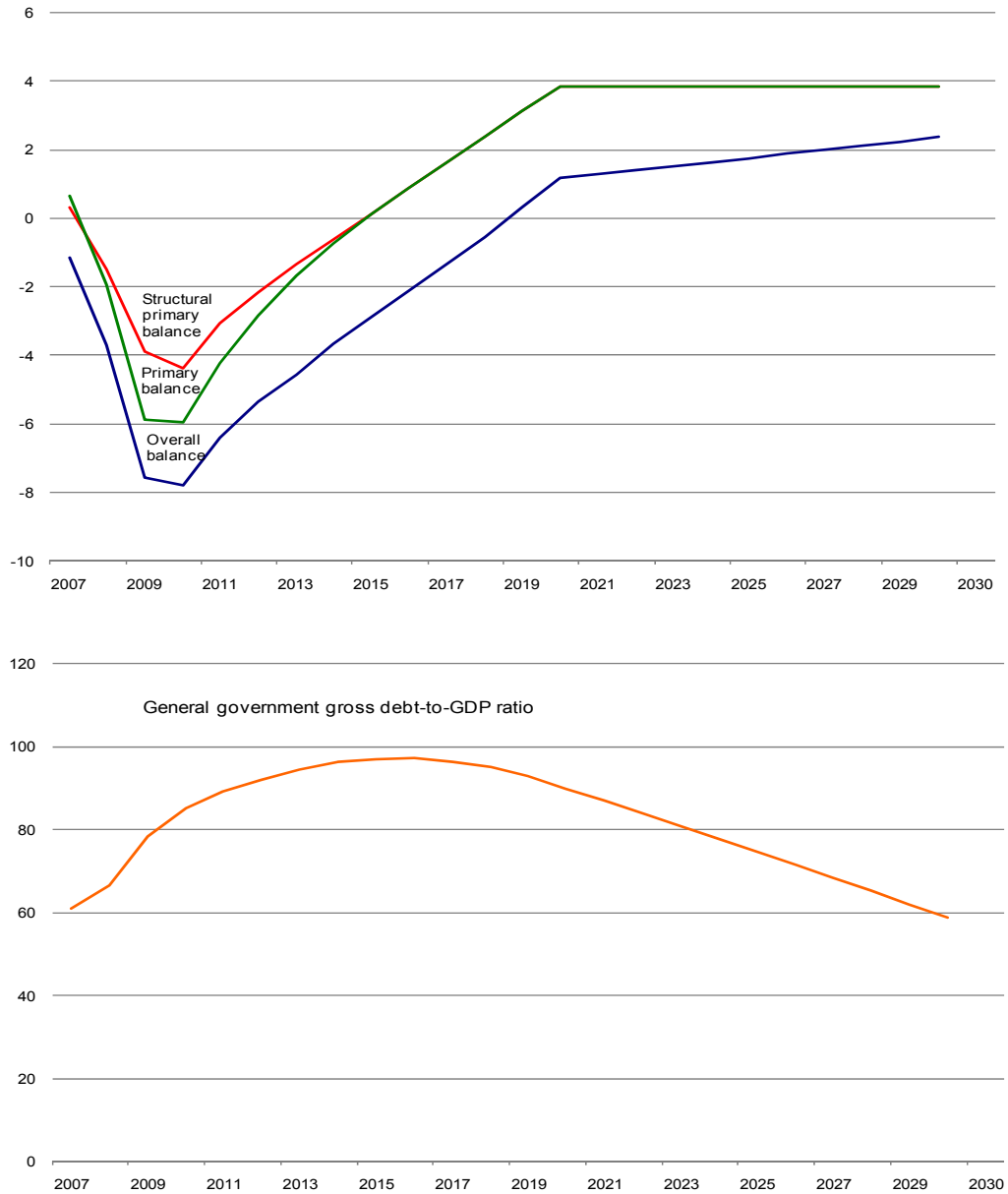
initial primary balance positions are fairly distinct. Also, given the fiscal effects of population aging, the adjustment with respect to a no-policy-change scenario is significantly more demanding, although attaining it would be facilitated if potential growth increased.

22. **While the precise magnitude of primary adjustment required over the medium term is sensitive to assumptions, the scale of the fiscal problem is large for various reasonable sets of parameter values** (Table 4). Assumptions about the differential between the rate of output growth and the rate of interest have an impact on estimated adjustment needs. However, even if the differential were to fall to zero, the required adjustment for the G-20 advanced economies to bring debt ratios to 60 percent or lower would remain sizable (nearly 7 percentage points of GDP between 2010 and 2020). The required degree of adjustment is more sensitive to the debt objective: stabilizing debt ratios at 2012 levels would cut the required adjustment by almost half. For the reasons noted earlier, however, this less ambitious strategy involves significant drawbacks.

23. **A similar exercise conducted for selected emerging economies shows that the improvement in the structural primary balance that is needed to achieve a debt ratio target of 40 percent by 2030 amounts to 2½ percentage points of GDP during 2011–2020** (Table 3b). However, unlike advanced economies, many emerging economies have room to ease the fiscal stance—from projected 2010 levels—to stabilize debt ratios at or below 40 percent.¹¹ At the same time, driving debt ratios to below 40 percent by 2030 would require significant fiscal consolidation in the cases of Poland, India, Malaysia, and Egypt.

¹¹ If the debt ratio is already lower than 40 percent, the primary balance path for that country is derived with a view to stabilizing the debt ratio at that lower level.

Figure 5. Advanced Economies: Illustrative Scenarios for Primary Balance Adjustment and Debt
(In percent of GDP)



Sources: IMF, World Economic Outlook, January 2010, and Fund staff estimates.

Notes: Structural balances are reported in percent of nominal GDP. For the United States, losses from financial sector support measures are excluded in this chart. In this paper's scenario, the primary balance is assumed to improve gradually from 2011 until 2020; thereafter, the primary balance is maintained constant until 2030. The primary balance path is set to stabilize a country's debt/GDP at its end-2012 level if this is less than 60 percent; otherwise, it is set to reduce the debt/GDP ratio to 60 percent by 2030. Illustrative scenarios for Japan are based on its net debt, and assume a target of 80 percent of GDP. For Norway, maintenance of primary surpluses at the projected 2012 level is assumed. The analysis is illustrative and makes some simplifying assumptions: in particular, beyond 2011, an interest rate–growth rate differential of 1 percent is assumed, regardless of country-specific circumstances.

24. **This magnitude of fiscal consolidation has several historical precedents at the individual country level.** While it will be the first time that most advanced economies have to undertake a simultaneous adjustment of such a large magnitude, over twenty advanced and thirty emerging economies have experienced large fiscal adjustments (i.e., adjustment in the structural primary balance of at least 5 percent of GDP) at least once over the past four decades (Tables 5a, 5b, and 6); ten advanced economies and twelve emerging economies experienced fiscal adjustments larger than 10 percent of GDP.¹² In addition, as shown in Figure 6, most of those countries were able to contain significantly the growth of annual primary spending, which averaged just over 1 percent in both advanced and emerging economies during the fiscal adjustment period.

25. **A key question is whether large primary surpluses can be sustained after the adjustment has been completed; the historical experience here is mixed.** The simulation shown in Figure 4 illustrates that, even though by 2020 the primary balance adjustment would be complete, it would be necessary to maintain the 2020 primary surplus for ten years to reach the debt ratio target of 60 percent by 2030. The evidence in Tables 5a and 5b shows that in many countries the primary balance fell substantially in the years following the end of the adjustment process. Of course, if countries had reached their debt ratio target by the end of this process, a reduction in the primary balance would be appropriate. However, considering the ten countries that had debt ratios significantly above 60 percent at the end of the adjustment process, only two-thirds either maintained the primary balance for five years or kept it at a level consistent with reaching a 60 percent debt ratio within 15 years.

What policies will deliver the needed fiscal adjustment in advanced economies?

26. **Not renewing the stimulus measures will improve the primary balance by 1½ percentage points of GDP on average.** Removing the fiscal stimulus should be relatively easy from a technical perspective, as stimulus packages included to a large extent time-bound measures (e.g., investment and one-off tax rebates) or contained explicit sunset provisions. Altogether, an estimated four-fifths of the fiscal stimulus in the G-20 countries is temporary (Fiscal Affairs Department, 2009b). This said, removing fiscal stimulus would be only one component of the needed 8 percentage points adjustment envisaged by the above scenario.

27. **In addition, fiscal structural reforms will be required, and will need to reflect specific country circumstances.** In this respect, two features are particularly relevant: first,

¹² Another piece of evidence that large fiscal consolidations are feasible stems from the estimation of a fiscal policy reaction function, which found that advanced economies respond more strongly to high debt: when debt ratios are above 80 percent, the estimated adjustment in the primary balance is almost three times as large as that observed at lower debt levels (IMF, 2003).

the tax burden is already high in several advanced economies, which means that a large part of the adjustment will have to take place on the spending side; second, pressures from population aging imply that entitlement spending will have to be reformed in many countries.

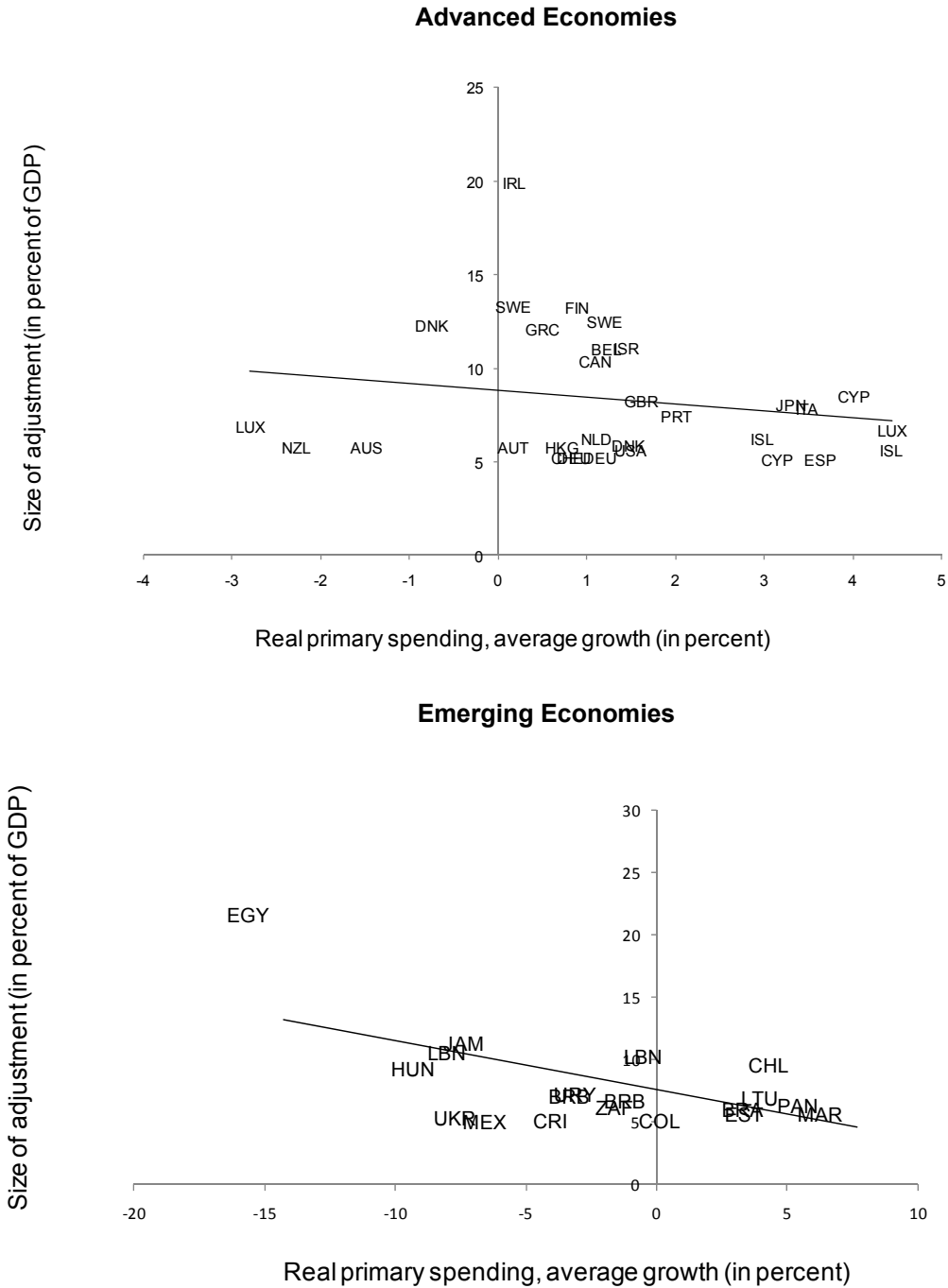
28. **Previous work on large and successful fiscal consolidations stresses the importance of reducing public spending.** For example, Alesina and Perotti (1997) found that, in successful cases only one-fifth of the spending cuts affected public investment, whereas the largest cuts (accounting for half of the total) focused on wages and transfers. Tsibouris et al. (2006) found similar patterns and noted in addition that several of the more institutionally advanced economies had established medium-term expenditure frameworks to help governments set and meet multi-year priorities and build credibility. Box 2 reviews existing studies on the composition of large and successful fiscal adjustments.

29. **Reforming pension and health entitlements will be critical.** This spending already represents a sizable share of total spending (e.g., in excess of one-third of total spending in the G-7 countries); and the net present value of future spending increases due to aging is estimated at more than ten times as large as the fiscal cost of the crisis (Cottarelli et al., 2009). In the absence of significant reform, spending on pensions and health could rise by 4–5 percentage points of GDP by 2030.¹³ While taking action to arrest such a trend is politically difficult, the effect of the needed measures could be phased in over time. Indeed, to the extent that long-term spending trends are ameliorated by structural reforms, a smaller improvement in the primary could then be targeted. In addition, some measures can have powerful effects: for example, staff analysis suggests that a one year increase in retirement ages in G-20 advanced economies could save almost 50 percent of GDP in NPV terms.¹⁴ However, given the strength of demographic factors, entitlement reforms would, at best, prevent aging pressures from adding to the primary adjustment needs identified above. That is, it may be unrealistic to expect that such reforms could lower pension and health spending significantly as a share of GDP.

¹³ Fund staff estimates. For EU countries, health care costs are based on the European Commission's Ageing Report, but under its less optimistic scenario for the growth of health care costs. (The European Commission's baseline projection is regarded by staff as too optimistic, because it does not take into account the likely continuation of the trend increase in the price of medical services observed in the last decades.) For other countries, official government projections are used when available. For pensions, baseline projections from the EU are used, and official government projections for other countries when available.

¹⁴ Moreover, some measures could, at least in principle, have a positive effect on output. Extending working lives can have a positive supply-side effect on output through an increase in the labor force; this effect is accompanied, on the demand side, by higher consumption due to higher incomes and a reduced need to save for retirement, as the retirement period is shortened.

Figure 6. Fiscal Adjustment and Real Primary Spending Growth During Adjustment Episodes



Source: IMF, World Economic Outlook database.

Note: Fiscal adjustment episodes listed in Tables 5a and 5b, respectively. Size of adjustment refers to cumulative improvements in the cyclically-adjusted primary balance during the entire adjustment episode.

30. **Reforms aimed at stabilizing entitlement-spending-to-GDP ratios are ambitious but attainable.** For example, simulations presented in Appendix II illustrate the magnitude of policy changes consistent with stabilizing pension expenditures as a share of GDP in the EU-27 countries over the next 20 years: (i) increasing retirement ages by 1½ years (in addition to the projected increase of 1½ years under the baseline); (ii) cutting (net) pensions by an additional 16 percent (from a projected decline of 7½ percent assumed under the baseline); or (iii) raising contribution rates by 2½–3 percentage points. Recent pension reforms in some advanced economies suggest that policies and savings of the magnitude required going forward are not unprecedented (Box 3). This said, an even more challenging area is health care reform, including as a result of stronger political pressures.

31. **With no expected decline in spending from ambitious entitlement reforms, other steps will be needed.** A strategy aimed at stabilizing other primary spending in real per capita terms—the focus of some successful debt reduction episodes—could be considered.¹⁵ With a pre-crisis ratio of about 23 percent between primary spending (excluding pension and health spending) and GDP for the large advanced economies, and assuming a real GDP growth rate of 2 percent, this approach would improve the primary balance by 3½ percentage points of GDP in 10 years. Reductions in spending ratios of this magnitude will require phasing out low priority programs and ensuring maximum spending efficiency. Improvements in expenditure prioritization and enhancement of value for money tools would be helpful in this regard. Eliminating energy subsidies is an area where considerable savings could be achieved. In implementing these expenditure reforms, it will be important to protect the poor and the unemployed. This is desirable on equity grounds, and would enhance the social and political sustainability of the overall strategies.

32. **Increased revenue will need to be part of the solution in many countries.** Given the primary adjustment target of some 8 percentage points of GDP in the above illustrative scenario, the remaining adjustment after removing fiscal stimulus, preventing a rise in entitlement spending, and containing other spending in the amount envisaged in the previous paragraph—some 3 percentage points of GDP—would have to come from the revenue side (Table 7). To that end, broadening the tax base by fighting tax evasion but also reducing exemptions or increasing coverage will play an important role. However, depending on the needed strength of the adjustment, the initial size and efficiency of the state, and societal preferences, tax rate hikes may also be necessary. Country-specific circumstances would help determine which taxes could be raised with the least distortionary impact. Changes to the tax

¹⁵ In the U.S., the Budget Enforcement Act of 1990 actually imposed a *nominal* freeze on discretionary spending and a pay-as-you-go rule for any changes in mandatory spending entitlements or tax rules. This was one of the key reasons why the fiscal deficit disappeared during the 1990s. The nominal freeze was successful because a rapid decline in military spending created room for higher discretionary spending elsewhere.

structure are likely to become more relevant than in the past, with externality-correcting taxes ranking among the highest priorities.¹⁶

Institutions and arrangements to support the fiscal consolidation

33. Strong budget institutions will also need to support fiscal consolidations.

Budgetary institutions and arrangements can play a key role in the three main stages of the fiscal policy making process in this regard:

- *Understanding the scale and scope of the fiscal challenge to design the necessary adjustment.* This requires comprehensive, timely and credible reporting of the current fiscal situation in the government's annual financial statements and statistics. This needs to be further supported by robust medium-term fiscal projections based on a credible macroeconomic framework and quantification of longer-term structural issues that raise sustainability concerns (e.g., aging, climate change). Moreover, comprehensive disclosure and management of fiscal risks helps ensure that the government's consolidation strategy is robust to changes in underlying forecast assumptions.
- *Developing a credible fiscal consolidation strategy.* The key elements include: (i) a commitment to a transparent medium-term fiscal objective or rule, that provides sufficient flexibility to accommodate unforeseen shocks; (ii) a medium-term budget framework that translates the fiscal objectives into a clear plan for the evolution of public spending by identifying the future costs of new policy initiatives and by setting multi-year ceilings on future spending commitments; and (iii) independent fiscal agencies that hold the government accountable to those objectives and ensure the realism of underlying assumptions, forecasts and policies.
- *Implementing the consolidation strategy through the budget process.* Effective implementation requires a comprehensive top-down approach to budget formulation in cabinet that ensures that budgets are prepared in a manner consistent with the government's overarching fiscal objectives. Procedures for budget approval in parliament should engage legislators in the determination of the overall fiscal strategy in exchange for clear limits on their power to amend the government's draft budget thereafter. Controls over budget execution need to strike a balance between

¹⁶ For example, given the requirements imposed by the fight against global warming, appropriate carbon pricing (through either carbon taxation or the sale of emission rights) could represent an important new source of revenue, averaging some ½ percent of GDP per year in some advanced economies over the next decade, and perhaps more later. Net benefits might be lower if their introduction is accompanied by increasing related transfers to developing economies.

the flexibility needed to manage contingencies with the discipline required to ensure the governments consolidation plans are respected and delivered.

34. **A review of current practices suggests that most countries, in varying degrees, need to strengthen their budgetary institutions and arrangements.** Such improvements are the more critical given the scale of fiscal challenges going forward and the need to articulate comprehensive and credible fiscal exit strategies. The following aspects are worth mentioning:

- *Fiscal reporting.* Basic fiscal reporting is not yet fully in place in many countries. This problem is particularly acute in low-income countries, but shortcomings exist also in emerging and advanced economies, including gaps in institutional coverage and general lack of balance sheet information. Moreover, while fiscal risks are increasingly being disclosed, comprehensive reporting is still limited, as few countries include a statement of fiscal risks in their budget documents, and with risk analysis often focusing only on formal guarantees. Similarly, a majority of countries do not yet produce reports on long run fiscal challenges and, among those that do, few include various scenarios.
- *Medium-term fiscal objectives.* While many countries articulate medium-term fiscal objectives or rules, their effectiveness as a guide for fiscal policy-making is often limited by ambiguities regarding precise target values or time horizons.¹⁷ Furthermore, these objectives are not always supported by the kind of comprehensive and binding medium-term budget frameworks needed to translate those objectives into detailed plans for the future evolution of revenue and expenditure. Finally, independent validation of the macroeconomic assumptions and fiscal judgments underpinning the government's fiscal strategy remains the exception in advanced countries and emerging countries.
- *Budget preparation and approval.* Budget preparation follows a top-down procedure in an increasing number of countries, but budgetary rigidities and circumvention of the budget process diminish its disciplining impact, particularly in low-income countries. Arrangements for controlling multi-year expenditure commitments and for dealing with contingencies in the course of budget execution remain in most cases insufficient, thus endangering the delivery of the consolidation plans.

¹⁷ This said, fiscal responsibility laws and fiscal rules have played a significant role during past large fiscal adjustments. Sizable debt reductions were often accompanied by the introduction of fiscal rules—although often implementation of the rule was delayed until the initial phase of the fiscal consolidation had been completed—to lock-in fiscal gains and to guard against reform fatigue (IMF, 2009b).

35. **The design and implementation of strategies for the management of government assets and liabilities should also support fiscal exit strategies.** There are various aspects to be considered in this context.¹⁸ Regarding government *liabilities*, in light of increased debt stocks and the possibility that interest rate rise with the economic recovery, there is a need to optimize their structure—in many cases lengthening debt maturities, to limit vulnerabilities. In addition, strategies will need to be put in place to deal with (and gradually unwind) the large contingent liabilities assumed during the financial crisis, including through other public sector entities. Governments will have to assume quasi-fiscal costs taken on by such entities, in particular central banks, and will have to review deposit insurance frameworks. On the *asset* side, proper management and disposal of financial assets acquired during the crisis,¹⁹ as well as divestiture of other assets held before the crisis,²⁰ should be considered as a means of reducing gross government debts (and the size of government balance sheets). Country authorities may occasionally face trade-offs between reselling assets to the private sector as soon as acquired banks or companies return to profitability, against a more gradual approach that might ultimately yield larger gains to the government's budget.

36. **Further progress in institutional arrangements would thus help underpin fiscal consolidation efforts.** Staff are engaged in further work seeking to enhance the analysis on the institutional determinants of effective consolidations, to better gauge the strength of existing institutions and, ultimately, to refine recommendations regarding areas of institutional vulnerability that should be addressed as part of fiscal consolidation strategies.

¹⁸ For a broader discussion, see “Crisis-Related Measures in the Financial System and Sovereign Balance Sheet Risks” (IMF, 2009c).

¹⁹ Proper management and disposal of the financial assets acquired during the crisis can give a small but non-trivial contribution to the reduction in government debt (perhaps of the order of 2-3 percentage points of GDP for advanced countries, against an initial investment of 4 percentage points of GDP).

²⁰ In spite of earlier sizable privatization during the 1990s, the value of state-owned enterprises in selected OECD countries still averages 17½ percentage points of GDP (based on a sample of 17 countries covered in “Corporate Governance of State-Owned Enterprises: A Survey of OECD Countries,” OECD, 2005; in most cases the data refer to enterprises owned by the central government).

Table 1. Counter-Factual Exercise: The Role of Inflation, 2009–14

	2009		2009–14	2014	
	Total Debt	MT-LT Debt 1/	Inflation, WEO 2/	Total Debt, with Average Inflation Equal to: WEO	6 Percent 3/
Australia	16.4	13.7	1.9	26.1	23.8
Canada	83.6	33.9	1.3	74.1	69.4
France	78.0	59.3	1.3	96.6	86.7
Germany	74.3	40.5	1.1	88.6	81.3
Italy	115.1	68.7	1.5	127.2	115.3
Japan	218.7	139.8	-0.6	247.6	225.0
Mexico	44.9	26.0	4.4	42.5	38.8
Turkey	46.8	26.0	4.8	46.6	43.4
UK	68.8	44.2	2.3	93.8	86.2
USA	83.8	45.7	1.6	103.1	94.6
Average	83.1	49.8	2.0	94.6	86.4

Sources: IMF, World Economic Outlook, January 2010, and Fund staff estimates.

1/ Medium-and-long-term debt in domestic currency, non-indexed.

2/ GDP deflator inflation, average over the period as projected in the WEO.

3/ This implies an increase in inflation by 4.3 percentage points over projected average inflation of 1.7 percent.

Table 2. Decomposition of Large Reductions in Debt-to-GDP Ratios in Advanced and Emerging Economies

Episodes	Starting Debt Ratio	Debt Reduction	Ending Debt Ratio	Primary Surplus	Growth - Interest Rate Differential	Residual
Ireland (1987-2002)	109.2	77.1	32.2	53.3	31.1	-7.4
Denmark (1993-2008)	80.1	58.1	22.0	51.3	-26.7	33.4
Belgium (1993-2007)	136.9	53.0	84.0	70.2	-25.2	8.0
New Zealand (1986-2001)	71.6	41.8	29.8	52.1	-8.9	-1.4
Canada (1996-2008)	101.7	39.0	62.7	39.3	-19.2	18.9
Sweden (1996-2008)	73.2	35.2	38.0	21.0	-4.6	18.7
Iceland (1995-2005)	58.9	33.6	25.4	17.4	4.7	11.4
Netherlands (1993-2007)	78.5	32.9	45.6	27.5	-8.3	13.7
Spain (1996-2007)	67.4	31.4	36.1	21.6	11.5	-1.7
Norway (1979-1984)	56.5	21.4	35.1	24.2	11.7	-14.5
Average	83.4	42.3	41.1	37.8	-3.4	7.9
<i>Emerging Market Economies</i>						
<i>Inflation >= 10 percent p.a.</i>						
Serbia (2001-2008)	114.5	82.8	31.6	-3.8	74.8	11.9
Bulgaria (1996-2007)	96.4	77.7	18.7	37.5	21.5	18.7
Poland (1993-1998)	84.3	47.7	36.7	3.3	50.6	-6.3
Turkey (2001-2007)	77.6	38.1	39.4	29.7	12.0	-3.6
Hungary (1993-2001)	88.7	36.5	52.2	22.6	37.0	-23.0
Chile (1989-1998)	46.8	33.9	12.9	35.7	29.5	-31.2
Ecuador (1991-1997)	88.7	26.9	61.8	10.7	24.0	-7.8
Sri Lanka (1989-1997)	105.1	22.1	83.0	-14.1	62.8	-26.6
Romania (1999-2006)	30.3	11.9	18.4	1.8	22.1	-12.0
India (1993-1998)	79.5	9.4	70.1	-8.2	19.5	-2.0
Average	81.2	38.7	42.5	11.5	35.4	-8.2
<i>Inflation < 10 percent p.a.</i>						
Egypt (1991-1997)	93.5	60.3	33.2	18.5	40.3	1.5
Paraguay (1989-1997)	72.9	51.5	21.3	-1.8	39.4	13.9
Thailand (1986-1996)	95.5	44.5	51.0	31.6	13.4	-0.6
Tunisia (1987-1992)	90.9	44.5	46.4	13.9	30.3	0.3
Indonesia (2000-2008)	53.6	43.3	10.3	33.4	19.1	-9.1
Uruguay (2002-2008)	100.9	41.7	59.2	31.6	20.0	-9.9
Georgia (1999-2007)	102.1	39.4	62.6	-3.5	44.7	-1.7
South Africa (1998-2008)	57.2	34.7	22.5	13.9	34.0	-13.1
Jordan (2002-2008)	73.6	29.0	44.6	12.1	10.4	6.5
Panama (1990-1998)	48.5	21.2	27.3	30.2	3.6	-12.6
Average	78.9	41.0	37.9	18.0	25.5	-2.5

Sources: IMF, World Economic Outlook and Fund staff estimates.

Notes: Figures are in percent of GDP. The episodes listed are based on a sorting of the largest reductions in the Debt-to-GDP ratio observed between any two years up to 15 years apart over the last three decades. The interest rate used in the computation of the growth interest rate differential is the "effective" interest rate, calculated as a ratio of government interest payments to the previous period's ending debt stock. For emerging markets, known episodes of debt default, exchange, or rescheduling were dropped. The inflation rate cut-off of 10 percent refers to the average inflation rate prevailing during the episode.

Table 3a. Advanced Economies: General Government Debt and Primary Balance
(in percent of GDP)

	Current WEO Projections, 2010			Illustrative Fiscal Adjustment Strategy to Achieve Debt Target in 2030	
	Gross Debt	Primary Balance	Structural PB	Structural PB in 2020-30	Required Adjustment Between 2010 and 2020
Australia	20.6	-4.9	-4.7	0.2	4.9
Austria	72.9	-3.1	-2.7	3.0	5.7
Belgium	100.9	-1.7	-1.1	4.7	5.8
Canada	84.8	-4.0	-1.6	2.4	4.0
Cyprus	62.3	-6.0	-4.6	3.9	8.5
Czech Republic	37.9	-3.4	-2.0	0.4	2.4
Denmark	46.0	-3.4	0.6	0.5	-0.1
Finland	48.1	-2.7	-0.2	0.5	0.7
France	84.9	-6.0	-2.1	3.9	6.0
Germany	77.3	-3.4	-1.7	2.7	4.4
Greece	129.5	-6.4	-6.5	9.0	15.5
Hong Kong	0.6	-2.7	-2.0	0.0	2.0
Iceland	131.2	-3.8	0.1	3.9	3.8
Ireland	74.5	-10.5	-8.7	4.8	13.5
Israel	83.3	-1.5	3.4	1.0	-2.4
Italy	117.6	-0.7	0.5	5.3	4.9
Japan	228.6	-8.7	-6.7	6.7	13.4
Korea	34.7	1.7	2.0	0.3	-1.7
Luxembourg	20.0	-4.1	-3.8	0.2	4.0
Malta	71.3	-1.5	-0.7	1.7	2.4
Netherlands	63.9	-4.0	-3.3	2.0	5.3
New Zealand	31.3	-3.0	-1.2	0.3	1.5
Norway	67.4	4.4	4.4	6.7	2.2
Portugal	83.3	-5.2	-3.7	3.9	7.5
Singapore	91.4	1.9	2.3	2.2	-0.2
Slovak Republic	38.1	-3.1	-2.2	0.4	2.6
Slovenia	35.6	-5.0	-3.4	0.4	3.8
Spain	63.7	-8.5	-6.1	3.3	9.4
Sweden	44.7	-4.5	-1.5	0.5	1.9
Switzerland	43.6	-0.3	0.0	0.4	0.4
United Kingdom	79.6	-9.6	-6.2	4.1	10.4
United States	91.8	-8.0	-6.4	4.2	10.6
<i>Average (PPP-weighted)</i>	98.3	-6.2	-4.4	3.9	8.2
<i>G-20</i>	105.1	-6.6	-4.7	4.1	8.8
<i>Higher debt</i>	106.4	-6.7	-4.8	4.3	9.1
<i>Lower debt</i>	32.2	-1.9	-0.7	0.3	1.1

Sources: IMF, World Economic Outlook, January 2010, where available; otherwise October 2009; and Fund staff estimates.

Notes: The table reports gross debt; for some countries with sizable assets, net debt is considerably smaller. Structural primary balances are reported in percent of nominal GDP. General government data are used where available. For the United States, the structural primary balance excludes losses from financial sector support. Data for Greece correspond to the October 2009 WEO, and therefore do not yet contain any measure included in the authorities' 2010 Stability and Growth Program. In the illustrative fiscal adjustment strategy, the structural primary balance is assumed to improve gradually from 2011 until 2020; thereafter, it is maintained constant until 2030. The last column shows the primary balance path needed to stabilize debt at the end-2012 level if the respective debt-to-GDP ratio is less than 60 percent (no shading, "lower debt"); or to bring the debt ratio to 60 percent in 2030 (shaded entries, "higher debt"). Illustrative scenarios for Japan are based on its net debt, and assume a target of 80 percent of GDP. For Norway, maintenance of primary surpluses at their projected 2012 level is assumed. The analysis is illustrative and makes some simplifying assumptions: in particular, beyond 2011, an interest rate-growth rate differential of 1 percent is assumed, regardless of country-specific circumstances.

Table 3b. Emerging Market Economies: General Government Debt and Primary Balance
(in percent of GDP)

	Current WEO Projections, 2010			Illustrative Fiscal Adjustment Strategy to Achieve Debt Target in 2030	
	Gross Debt	Primary Balance	Structural PB	Structural PB in 2020-30	Required Adjustment Between 2010 and 2020
Argentina	51.6	0.1	-0.5	0.6	1.1
Belarus	23.1	-0.3	0.2	0.2	0.0
Brazil	64.9	2.3	2.6	1.6	-1.0
Bulgaria	20.2	-1.2	0.9	0.2	-0.7
Chile	5.0	-2.1	-0.2	0.0	0.2
China	20.8	-2.6	-2.7	0.2	2.9
Colombia	36.1	-0.7	4.3	0.3	-4.0
Croatia	36.2	-1.5	0.2	0.4	0.2
Egypt	74.3	-3.7	-3.8	2.2	6.0
Hungary	80.2	0.7	4.6	2.3	-2.3
India	81.3	-3.7	-3.8	3.8	7.6
Indonesia	30.4	-0.2	-0.4	0.3	0.7
Malaysia	48.3	-4.1	-4.6	2.3	6.8
Mexico	43.3	-0.9	-0.1	0.7	0.8
Nigeria	15.4	-0.3	-0.1	0.1	0.2
Pakistan	56.4	0.1	0.4	1.6	1.2
Peru	26.4	0.1	-0.5	0.2	0.8
Philippines	60.4	0.7	0.8	1.2	0.4
Poland	56.2	-4.5	-4.4	2.9	7.3
Romania	33.3	-4.2	-1.5	0.3	1.8
Russia	9.9	-3.1	-1.3	0.1	1.4
Saudi Arabia	13.2	8.3	8.7	11.6	2.8
South Africa	35.4	-4.5	-3.4	0.4	3.8
Turkey	48.0	-0.1	0.6	1.0	0.3
Ukraine	34.6	-1.3	1.0	0.3	-0.7
<i>Average (PPP-weighted)</i>	39.2	-1.7	-1.3	1.3	2.6
<i>G-20</i>	37.9	-1.7	-1.4	1.3	2.7

Sources: IMF, World Economic Outlook, January 2010, where available; otherwise October 2009; and Fund staff estimates.

Notes: General government data are used where available. In computing the primary balance, policy lending was excluded from primary expenditure. Structural balances are reported in percent of nominal GDP. For Turkey, fiscal projections reflect staff's assessment of the policy measures underpinning the authorities' medium-term program. For the Ukraine, the primary deficit excludes costs related to bank recapitalization and gas utility. In the illustrative fiscal adjustment strategy, the structural primary balance is assumed to improve gradually from 2011 until 2020; thereafter, the primary balance is maintained constant until 2030. The last column shows the primary balance path needed to stabilize debt at the end-2012 level if the respective debt-to-GDP ratio is less than 40 percent; or to bring the debt ratio to 40 percent in 2030. For Saudi Arabia, maintenance of primary surpluses at their projected 2012 level is assumed. The analysis is illustrative and makes some simplifying assumptions: in particular, beyond 2011, an interest rate–growth rate differential of 1 percent is assumed, regardless of country-specific circumstances. Also, for large commodity producing countries, the volatility of revenues and the exhaustibility of natural resources might call for a larger fiscal balance in the medium term.

Table 4. Required Adjustment of Structural Primary Balance: Sensitivity to Variations in Interest and Growth Rates (r-g) and Debt Targets
(in percent of GDP)

2030 Debt Target	Required Adjustment of Structural Primary Balance Between 2010 and 2020		
	r-g		
	0	1	2
60 percent of GDP			
All advanced economies	7.2	8.2	9.3
G-20 advanced economies	7.7	8.8	9.9
High debt	8.0	9.1	10.2
Low debt	0.7	1.1	1.4
80 percent of GDP			
All advanced economies	6.1	7.2	8.3
G-20 advanced economies	6.6	7.8	8.9
High debt	6.8	7.9	9.1
Low debt	0.7	1.1	1.4
Pre-crisis levels			
All advanced economies	7.1	8.1	9.2
G-20 advanced economies	7.5	8.6	9.7
High debt	7.8	8.9	10.0
Low debt	1.4	1.7	2.1
Post-crisis levels			
All advanced economies	4.4	5.3	6.1
G-20 advanced economies	4.7	5.6	6.6
High debt	4.8	5.8	6.7
Low debt	0.7	1.1	1.4

Sources: IMF, World Economic Outlook, January 2010 and IMF staff estimates.

Notes: This table reports the adjustment in the structural primary balance required during 2011-20, in order to reach various objectives (as listed) by 2030. The primary balance would be gradually improved through 2020 and maintained constant thereafter. The objectives "pre-crisis levels" and "post-crisis levels" indicate that each country would reduce its debt-to-GDP Ratio to its pre-crisis (2007) or post-crisis (2012) level, respectively, by 2030. On average (PPP-weighted), the pre- (post-) crisis debt target is 60.8 (92.1) percent of GDP. For Japan, all data refer to the net debt, and the target level is set to 80 percent of GDP in the first two rows of this table. For Norway, maintenance of primary surpluses at their projected 2012 level is assumed throughout. For the first and second exercises, for economies with a debt/GDP level below 60 percent in the first exercise (or below 80 percent in the second exercise), illustration is based on a primary balance path needed to stabilize the debt/GDP ratios at their end-2012 levels. "r-g" indicates the assumed difference between the interest rate and the rate of economic growth.

Table 5a. Advanced Economies' Experiences with Large Fiscal Adjustments

Country (End-Year)	Size	Of Which: Revenue Increase	Of Which: Primary Expenditure Reduction	Length (Years)	Debt at End- Year	Cyclically-Adjusted Primary Balance	
						At End- Year	Average Over the Five Years After End of Adjustment
<i>Advanced economies</i>							
Ireland (1989)	20.0	8.1	11.8	11	98.8	4.4	3.6
Sweden (2000)	13.3	3.0	10.4	7	53.6	3.8	1.1
Finland (2000)	13.3	2.6	10.7	7	43.8	7.1	3.7
Sweden (1987)	12.5	7.2	5.3	7	...	4.8	0.2
Denmark (1986)	12.3	6.3	6.0	4	76.5	6.6	4.3
Greece (1995)	12.1	9.9	2.3	6	99.2	4.8	4.1
Israel (1983)	11.1	-0.1	11.2	3	158.3	2.6	7.9
Belgium (1998)	11.1	0.4	10.7	15	117.1	6.7	6.1
Canada (1999)	10.4	4.0	6.4	14	91.4	5.6	3.2
Cyprus (2007)	8.5	7.8	0.7	4	59.4	6.1	...
United Kingdom (2000)	8.3	3.2	5.1	7	40.9	2.9	-0.6
Japan (1990)	8.1	7.0	1.1	12	69.3	2.7	-0.5
Italy (1993)	7.9	8.9	-1.0	8	115.6	3.0	4.0
Portugal (1985)	7.5	8.3	-0.8	4	...	2.6	0.3
Luxembourg (1985)	6.9	5.5	1.4	4	10.3	5.1	3.2
Luxembourg (2001)	6.7	5.2	1.6	10	6.5	6.1	1.0
Iceland (2006)	6.3	4.6	1.6	4	30.1	5.9	...
Netherlands (2000)	6.3	-2.8	9.0	10	53.8	4.1	1.0
Denmark (2005)	5.9	2.1	3.8	11	36.4	6.4	...
Hong Kong SAR (2005)	5.8	4.4	1.5	4	...	1.0	...
Australia (1988)	5.8	0.7	5.1	4	22.1	3.7	0.3
New Zealand (1995)	5.8	-1.3	7.1	4	46.5	7.1	3.9
Austria (2001)	5.8	1.1	4.6	6	67.1	2.2	0.7
Iceland (2000)	5.7	4.9	0.7	6	41.0	3.1	1.6
United States (2000)	5.7	3.0	2.6	8	55.5	3.7	-1.0
Germany (2000)	5.3	3.4	1.9	9	58.7	3.5	-0.7
Germany (1989)	5.3	-0.1	5.4	10	40.6	2.7	-0.4
Switzerland (2000)	5.2	4.6	0.6	7	51.8	3.6	1.3
Cyprus (1994)	5.2	4.2	0.9	3	80.7	4.0	0.6
Spain (2006)	5.2	2.5	2.7	11	39.6	3.0	...
Mean	8.3	4.0	4.3	7.3	61.7	4.3	1.9
Median	6.8	4.1	3.2	7.0	53.8	3.9	1.1

Sources: IMF, World Economic Outlook database and Fund staff estimates.

Notes: Cumulative change in cyclically-adjusted primary balance (CAPB) in percentage points of GDP for episodes lasting at least three years. In a given consolidation episode, which is defined to last at least three years, the CAPB should not be reversed by more than 1 percentage point from one year to the next. The table lists largest adjustments per country, unless episodes for a given country are completely nonoverlapping. For Hong Kong SAR, further adjustment through 2007, as a result of asset price effects, is not taken into account.

Table 5b. Emerging Economies' Experiences with Large Fiscal Adjustments

Country (End-Year)	Size	Of Which: Revenue Increase	Of Which: Primary Expenditure Reduction	Length (Years)	Debt at End- Year	Cyclically-Adjusted Primary Balance	
						At End- Year	Average Over the Five Years After End of Adjustment
<i>Emerging economies</i>							
Georgia (2004)	24.9	13.4	11.5	10	45.7	8.1	...
Jamaica (1989)	23.6	10.4	13.2	6	...	18.0	13.4
Egypt (1994)	21.7	4.3	17.4	3	68.8	7.5	5.1
Tunisia (1989)	16.5	-0.8	17.3	6	...	11.4	-0.9
Jordan (1990)	15.8	7.8	8.0	3	219.9	5.8	3.1
Mexico (1984)	14.3	6.2	8.1	3	...	5.8	8.2
Turkey (1990)	12.5	5.1	7.4	3	...	1.7	-0.8
Jamaica (2000)	11.4	5.6	5.8	3	103.4	14.7	10.2
Lebanon (1999)	10.6	1.4	9.2	3	131.5	-2.4	-1.2
Egypt (1987)	10.4	-13.1	23.5	3	...	-9.1	-8.4
Lebanon (2006)	10.3	6.0	4.4	6	179.9	3.3	...
Slovak Republic (1995)	9.6	-2.8	12.4	3	21.4	2.3	-2.9
Chile (2007)	9.6	7.0	2.6	8	4.1	9.2	...
Morocco (1988)	9.4	0.3	9.1	6	...	1.6	3.0
Hungary (1996)	9.3	-1.7	11.0	3	71.5	6.3	3.0
Bulgaria (1996)	9.1	-5.6	14.7	3	...	9.4	5.2
Panama (1986)	9.1	2.4	6.7	4	...	4.7	4.1
Paraguay (1990)	9.1	4.0	5.1	9	...	5.6	1.6
Romania (1984)	8.7	-4.8	13.5	5	...	7.2	5.4
Turkey (2001)	8.6	11.6	-3.0	4	77.6	6.2	5.2
Romania (1999)	8.4	2.8	5.6	3	30.3	2.8	0.5
Costa Rica (1992)	7.7	18.4	-10.7	3	49.8	6.0	2.7
Uruguay (2006)	7.3	0.4	6.8	7	58.0	3.7	...
Barbados (2005)	7.1	0.7	6.4	3	79.4	4.7	...
Argentina (2004)	7.0	5.3	1.7	3	...	5.6	...
Lithuania (2005)	7.0	1.8	5.2	6	18.5	0.4	...
Pakistan (2003)	6.8	-0.2	7.1	12	74.4	3.2	-0.3
Barbados (1999)	6.7	1.8	4.9	3	59.1	5.4	0.8
Panama (2007)	6.4	6.4	0.0	3	51.6	5.6	...
South Africa (1999)	6.2	-0.1	6.4	7	46.2	3.9	2.8
Dominican Republic (1992)	6.1	-1.1	7.2	3	...	3.4	-0.6
Brazil (2003)	6.1	8.1	-2.0	6	76.5	4.6	3.9
Estonia (2003)	5.7	0.3	5.5	4	5.6	3.0	0.5
Morocco (2008)	5.7	7.7	-2.0	3	48.5	4.5	...
Peru (2007)	5.4	2.7	2.7	8	30.9	4.7	...
Ukraine (2000)	5.4	-3.3	8.7	3	45.3	2.1	-0.8
El Salvador (1997)	5.2	1.9	3.4	5	...	0.4	-2.1
Colombia (2005)	5.2	1.6	3.5	8	38.8	3.3	...
Costa Rica (1997)	5.1	-1.7	6.8	3	18.6	3.8	1.9
Mexico (1997)	5.1	0.1	5.0	3	47.8	2.9	0.7
Dominican Republic (1985)	5.0	5.0	0.0	3	...	0.1	-2.0
Mean	9.4	2.8	6.6	4.7	63.1	4.7	2.1
Median	8.4	1.9	6.4	3.0	49.8	4.6	1.7

Sources: IMF, World Economic Outlook database and Fund staff estimates.

Notes: Cumulative change in cyclically-adjusted primary balance (CAPB) in percentage points of GDP for episodes lasting at least three years. In a given consolidation episode, the CAPB should not be reversed by more than 1 percentage point from one year to the next. The table lists largest adjustments per country, unless episodes for a given country are completely nonoverlapping.

Table 6. Fiscal Adjustment Episodes: Average Cyclically Adjusted Primary Balance (CAPB)

CAPB	4 Years	5-7 Years	8-10 Years	11-13 Years	14-15 Years
2-3		Uruguay (2002-08; 46.4); Peru (2002-08, 25.6); Sweden (75-91); Japan (76-92, 73.0); Pakistan (99-2004; 67.8); Malaysia (95-2000, 35.3); Lebanon (2003-08, 162.5); Bulgaria (2001-05, 31.3); Cyprus (93-97, 87.5); United Kingdom (97-2001, 37.7)	Tunisia (86-95, 58.5); Argentina (99-2008); Australia (97-2006, 9.6); Columbia (2000-08, 30.4); Spain (1999-2007, 36.2); Switzerland (2000-07, 44.3); United States (2001-08, 55.5)	Morocco (87-99, 72.0); Indonesia (94-2006, 39.0); Iceland (95-2007, 28.7); Austria (76-88, 57.3); Hungary (90-2001, 52.1)	Egypt (92-2006, 98.8); Jordan (89-2003, 99.6); Israel (80-94, 109.6); Panama (94-2008, 40.8); Mexico (87-2001, 44.3); Chile (92-2006, 5.3); Brazil (94-2008, 64.5); South Africa (94-2008, 27.3); New Zealand (85-99, 33.8); Turkey (94-2008, 39.5); Iceland (86-2000, 37.8); Finland (76-90, 14); Canada (94-2008, 63.6); Netherlands (93-2007, 45.9); Luxembourg (88-2002, 6.5); Italy (93-2007, 103.5); Denmark (91-2005, 36.4); Belgium (83-97, 122.3); Hong Kong (84-97); Greece (94-2007, 94.8)
3-4	Jamaica (83-86); Peru (2005-08, 25.6)	Hungary (95-2001, 52.1); Argentina (2002-08); Tunisia (85-90); St. Lucia (85-90); Netherlands (96-2001, 50.7); Morocco (90-94, 78.7); Malaysia (95-99, 36.9); Iceland (2003-07, 28.7); Sweden (86-90); United States (97-2001, 55.5)	South Africa (98-2007, 28.5); Greece (94-2003, 98); Jordan (89-97, 113.4); Austria (76-84, 46.2); Costa Rica (91-98, 16.8)	Canada (95-2007, 64.2); Bulgaria (97-2008, 16.7); Egypt (92-2003, 114.8); Finland (97-2008, 33.4); Brazil (98-2008, 64.5)	Romania (80-94); Israel (84-98, 101.4); Barbados (91-2005, 79.36); Panama (83-97, 67.2); Mexico (86-2000, 45.5); Chile (94-2008, 3.4); New Zealand (89-2003, 25.8); Ireland (88-2002, 32.2); Luxembourg (87-2001, 6.5); Denmark (86-2000, 51.5); Belgium (85-99, 113.7); Turkey (94-2007, 39.4); Italy (92-2005, 105.8);
4-5	St. Lucia (87-90); Iceland (2004-07, 28.8)	Greece (94-2000, 103.4); Finland (2000-06, 39.2); Jordan (89-94, 136.7); Brazil (2001-06, 63.7); Austria (76-81, 37.6); Luxembourg (96-2001, 6.5); Hungary (96-2000, 53.9); Tunisia (85-89); Jamaica (83-87); Argentina (2002-06)	Egypt (92-2001, 83.2); Turkey (99-2008, 39.5); Ireland (91-2000, 37.8); Barbados (91-99, 59.1); Denmark (98-2006, 30.6); Canada (96-2003, 76.6); Italy (93-2000, 109.2)	Panama (85-97, 67.2); Romania (80-91); Chile (87-97, 13.6)	Bulgaria (94-2008, 16.7); Israel (85-99, 95.3); Mexico (83-97, 47.6); New Zealand (93-2007, 58.4); Belgium (92-2006, 87.7)
5-10	Panama (89-92, 89.9); Canada (97-2000, 82.1); Italy (97-2000, 109.2); Tunisia (86-89); Austria (76-79, 34.2)	Turkey (2000-06, 46.1); Chile (2003-08; 3.4); Jamaica (83-88); New Zealand (93-98; 36.4); Barbados (91-95; 67.4); Denmark (85-89; 69.7)	Romania (82-89); Egypt (93-2000; 75.4)	Mexico (83-95, 40.8); Israel (83-94, 109.6)	Belgium (90-2004, 94.5); Jamaica (92-2006, 94.3); Bulgaria (94-2007; 19.8)
10 and above	Israel (85-88, 141)				Jamaica (86-2000, 103.4)

Sources: IMF, World Economic Outlook database and Fund staff estimates.

Notes: The first variable in the parentheses show the years of the episode, and the second variable shows the debt-to-GDP ratio at the end of the episode. The table lists the largest adjustment per country.

Table 7. Required Improvement in the Primary Position, 2011–2020
(in percentage points of GDP) 1/

Cyclically adjusted primary balance in 2010	-4 $\frac{1}{3}$
Cyclically adjusted primary balance in 2020	3 $\frac{3}{8}$
Improvement in the cyclically adjusted primary balance	8
Allowing fiscal stimulus to expire	1 $\frac{1}{2}$
Freeze in real spending outside pension and health	3 $\frac{1}{2}$
Tax increases	3
Memorandum item:	
Measures to keep health and pension spending constant in relation to GDP 2/	4–5

Source: Fund staff estimates.

1/ Improvement in the cyclically adjusted primary balance of advanced economies needed to lower the general government gross debt below 60 percent (below 80 percent for net debt for Japan) by 2030, assuming the primary improvement takes place during 2011–2020 and the primary surplus is maintained at its 2020 level in relation to GDP for the following 10 years. The average primary cyclically adjusted balance during 2011–29 would be 2 $\frac{1}{2}$ percent of GDP (3 $\frac{3}{8}$ percent of GDP during 2015–29).

2/ In the absence of measures, health and pension spending will rise by 4–5 percentage points of GDP over the next two decades. Offsetting measures for that amount would thus be required to maintain health and pension spending constant as a share of GDP.

Box 1. Public Debt and Economic Growth

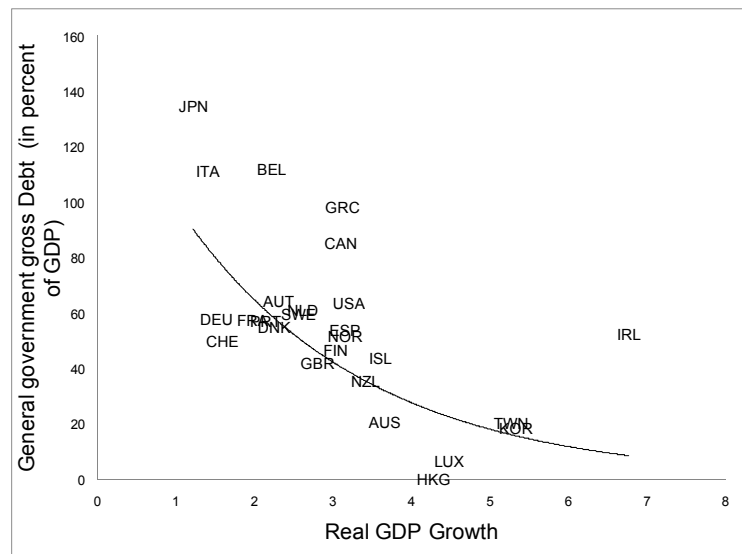
Theory suggests that high levels of public debt would reduce long-run economic growth. While the empirical evidence is mixed, some studies have found such an effect for external debt in emerging and developing economies.

Theoretical models of long-run economic growth suggest that a reduction in national savings would cause a decline in economic growth, which could be permanent in an endogenous growth model, or temporary in the Solow growth model. Thus, if lower public savings result in lower national savings (i.e., in the absence of full Ricardian equivalence), higher budget deficits would cause not only an increase in public debt, but also a fall in long-run economic growth (Saint-Paul, 1992).

While an extensive empirical literature based on cross-country growth regressions has failed to identify robust relationships between fiscal variables and economic growth, some studies have found a negative impact of external debt on economic growth in emerging and developing economies, for external debts within certain thresholds. These studies' main interest was in documenting "debt overhang," that is, reduced incentives for countries to invest—and thus grow—when the economic benefits of such growth would ultimately accrue to external debt holders. Pattillo, Poirson, and Ricci (2002, 2004) find a non-linear effect of debt on growth: negative and significant at high debt levels (both through lower investment efficiency and lower capital accumulation), but insignificant at low debt levels. Cordella, Ricci, and Ruiz-Arranz (2005) find the relationship to be negative and significant at intermediate debt levels, but insignificant at very-low and very-high debt levels.

The graph below illustrates that, for the 15 years prior to the onset of the current crisis, there seemed to be a negative correlation between debt ratios and growth for most advanced economies (Ireland and Singapore being the exception).

**Average Growth and Average Government Debt over 1992-2007,
Advanced Economies**



Box 2. Large and Successful Fiscal Adjustments: Lessons from the Literature

The composition of fiscal adjustment matters, with expenditure-based adjustments being longer lasting and eliciting more non-Keynesian growth responses.

- Successful adjustments (i.e., those that durably reduce public debt) emphasize cuts in primary expenditure, especially government wages and transfers, over tax increases (Alesina and Perotti, 1995; McDermott and Wescott, 1996; Alesina and Ardagna, 1998 and 2009; Tsibouris et al., 2006). However, there is a role for revenue as well. In OECD countries, business tax increases that were offset by cuts in other direct taxes also improved the success of the adjustment effort (Alesina and Perotti, 1995; Alesina and Ardagna, 2009). Evidence also suggests that revenue increases can help in the early phases of adjustment before governments can switch to cutting recurrent spending (OECD, 2007). Raising revenue from initially low levels—a feature in many LICs and some emerging economies—has also contributed to successful adjustments. (Gupta et al., 2003; Ardagna, 2004; Tsibouris et al., 2006).
- Fiscal contractions are more likely to expand output when cuts focus on government wages (Ardagna, 2004) or transfers (Alesina and Perotti, 1995; Alesina and Ardagna, 2009). Similarly, in expansionary fiscal contraction episodes, income taxes were lowered, whereas in contractionary episodes income taxes were increased (Alesina and Ardagna, 2009).

While the phasing of fiscal adjustment does not seem to be a good predictor of success, adjustment fatigue should be avoided. Given the emphasis in the literature on shorter-lived fiscal adjustment periods, evidence is limited on whether a multi-year adjustment should be gradual or upfront. For a broad set of countries, Tsibouris et al. (2006) shows a broad balance between upfront and gradual approaches among successful adjustments. However, backloaded adjustments in a sample of emerging economies were found to be more successful in reaching sustainability, but not in preserving it (Baldacci et al., 2006). Duration studies (von Hagen, 2001; Tsibouris et al., 2006) typically point to adjustment fatigue, in that longer adjustment periods increase the probability of ending the adjustment.

Other factors can play a role in successful fiscal adjustments. A favorable external economic environment facilitates the success of fiscal consolidation (McDermott and Wescott, 1996; Tsibouris et al., 2006; von Hagen, 2001). Challenging initial conditions often help policy makers to push through difficult fiscal reforms (Ardagna, 2004; von Hagen 2001). Accompanying monetary and exchange rate policies help explain the success and growth response in some fiscal consolidation episodes, though not in all. Finally, successful fiscal consolidations are typically accompanied by structural reforms, as several countries established medium-term expenditure frameworks, introduced fiscal rules, and/or reformed intergovernmental fiscal arrangements (IMF, 2009b).

Box 3. Fiscal Savings from Pension Reforms in Advanced European Economies

Evidence from recent pension reforms in some advanced European economies suggests that savings of the magnitude required going forward are not unprecedented. Indeed, savings obtained through reforms undertaken in 1995–2005 amounts to more than 2 percentage points of GDP by 2030 and 3 percentage points by 2050. Table 1 presents gross public pension expenditure as a share of GDP in 2030 as projected in 1995 and 2005 for selected countries that undertook important reforms during that period.

Table 1. 1995 and 2005 Projections of Public Pension Expenditure in 2030
(In percent of GDP)

	Pension Expenditure in 2030 as Projected in		Difference in Projections
	1995	2005	2005-1995
Finland	17.8	14.0	3.8
Germany	16.5	12.3	4.2
Italy	20.3	15.0	5.3
Spain	14.1	11.8	2.3
Sweden	15.0	11.1	3.9

Sources: European Commission (2006); OECD Working Paper No. 168.

Some countries mainly implemented parametric reforms and reduced retirement incentives, whereas others combined these reforms with structural reforms, such as notional defined-contribution schemes. These reforms, described in more detail in Disney (2003) and European Commission (2006), are summarized below:

- **Finland. 1997 reform.** The retirement age is raised, and the limit for early retirement is lowered. **2003–2005 reforms.** The effective retirement age is raised, and an actuarial reduction is applied to those retiring prior to 63. The ceiling on the maximum pension is abolished. Pension benefits are calculated on the basis of life-time earnings.
- **Germany. 1992–2001 reforms.** The transition period of the increase of the statutory retirement age is shortened several times. Pensions are reduced in the case of early retirement. **2001–2004 reforms.** The 2001 reform promotes supplementary pension schemes while reducing slightly the target replacement ratio (the replacement rate was also reduced in 1997). The 2004 reform introduces a sustainability factor in the pension indexation formula, by maintaining a fixed ratio between the number of beneficiaries and contributors (dependency ratio).
- **Italy. 1995 reform.** The reform replaces the existing defined-benefit system with a notional defined-contribution system. Furthermore, it tightens the conditions on seniority, disability and survivors' pensions, and broadens the contribution base. **2004 reforms.** As of 2008, the early pension option is tightened, and age limits are raised.

- **Spain. 2002–2005 reforms.** The mandatory retirement age is abolished while, after the age of 65, the accrual of pension rights is increased and contributions abolished. Early retirement is discouraged by a reduction in contribution rates. Moreover, pension benefits are reduced, depending on the number of contribution years.
- **Sweden. 1998 reforms.** A notional defined-contribution scheme and indexation to life expectancy and GDP growth are introduced in 1999. Under the new system, it is possible to retire from the age of 61, with an actuarially fair compensation for those who decide to stay on in the labor force. Every year of contribution is included in the calculation of pension benefits. For a person receiving the average wage in the economy, yearly pension benefits would increase by nearly 60 percent if retirement is postponed until age 67 (compared to leaving the work force at age 61).

Appendix I. Can a High Share of Domestic Debt Improve Public Debt Tolerance?

This appendix presents new evidence on the impact of public debt composition on perceived debt tolerance in 60 advanced and emerging economies. Cross-country regressions of international institutional investors' sovereign ratings on debt ratios interacted with a debt composition variable suggest that the adverse impact of rising debt levels on investor ratings is significantly attenuated if debt composition is skewed toward domestic debt.

Background and motivation

Reinhart, Rogoff and Savastano (2003) first suggested that emerging economies are able to sustain lower debt levels than advanced economies. They argued that such “debt intolerance” may stem from a history of default or macroeconomic instability, but did not investigate the role of debt composition in this regard. At the same time, the literature on banking and external debt crises suggests that markets often take a rising concentration of debt in short maturities or foreign currency as a leading crisis indicator (Detragiache and Spilimbergo, 2001). This appendix tackles the empirical question of how the composition of public debt—domestic versus external—might impact its perceived sustainability.

A debt tolerance-debt composition nexus Investors are more likely to hold a given level of government debt the stronger is their perception of the government's *willingness* and *ability* to honor that debt. The sovereign default literature suggests that governments are generally more *willing* to honor debt held by domestic agents—who are typically either citizens with voting rights, or systemically important institutions such as banks—as opposed to foreign investors (Bolle, Rother and Hakobyan (2006), and Drazen (1996)). Moreover, because governments have more room to determine the ex-post return on nominal debt and hence, avert a full-blown fiscal crisis that the need for sharp fiscal contraction or servicing foreign debt may otherwise entail, a higher share of domestic debt can strengthen perceptions of the government's *ability* to sustain a given level of debt (Alesina, Prati and Tabellini (1990), Alesina (1988b) and Bohn (1988)).

At the same time, the “original sin” literature highlights domestic debt issuance as an outcome rather than choice variable. Governments that are unable to credibly commit to low future inflation (either due to a poor track record, or lack of investor trust going forward) find themselves effectively consigned to issuing short-term, indexed, or foreign currency debt (Eichengreen and Hausmann, 2005). By analogy, however, governments which successfully issue and roll-over substantial amounts of domestic debt, signal their strong policy credibility vis-à-vis debt holders.

Combining the insights above, it is possible to frame the following hypothesis on the debt tolerance-debt composition nexus: *Investors are likely to view more favorably governments maintaining a high domestic share in sovereign debt, given the perceived association of such a debt composition with greater debt tolerance.*

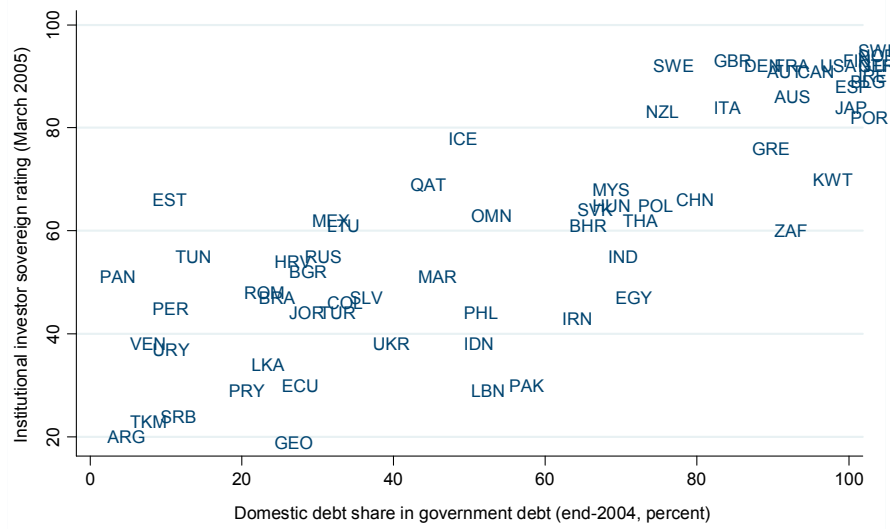
Data and empirical methodology

Empirical pursuit of this question has typically been constrained by lack of good quality time series data on domestic debt. Although the last few years have seen the emergence of some useful cross-country datasets, most of these cover subsets of countries, with cross-sample comparability complicated by definitional differences. Indeed, domestic debt has been taken to mean a number of things, e.g., local currency debt, non-indexed debt, debt issued to domestic residents, debt *held* by domestic residents, or debt issued under domestic laws.

The analysis in this appendix uses the following definition of domestic debt: “central government local currency, non-indexed debt issued under domestic law.” Data are available for 22 advanced and 38 emerging economies, from three databases: the Guscina and Jeanne (2006) and Cowan et al. (2006) databases

for emerging markets; and the OECD Central Government Debt Statistics for advanced economies. Since the first two databases end in 2004, that year is chosen for the cross-country regressions presented below.²¹ A simple cross-plot of the March 2005 institutional investor sovereign ratings (index from 0 to 100, with higher values indicating more favorable

Scatter Plot of Institutional Investor Ratings vs. Domestic Debt Share in Government Debt, Advanced and Emerging Economies



²¹ The exercise was also conducted for: (i) end-2007, using BIS data (which covers a narrower list of countries), and (ii) 2004, using a sample including LICs from Abbas and Christensen (2009). The results are robust.

ratings) against the domestic debt share (in government debt, at end-2004) reveals a strong positive relationship, albeit unconditional.²²

To see whether a conditional association between the two variables also exists, the following regression was estimated:

$$IIR_i = \alpha + \beta DEBT_GDP_i + \gamma DEBT_GDP_i * DDINT_i + \phi PCGDP_i + \varepsilon_i$$

where: IIR = institutional investors' sovereign rating of March 2005; DEBT_GDP = end-2004 government debt-to-GDP ratio (in percent); DDINT is a dummy variable (taking the value 0, 1 or 2 depending on whether the domestic share in government debt falls in the lower, middle or upper tertile, respectively); PCGDP is the end-2004 real PPP per capita GDP and is included as a control.²³

Results and conclusion

The cross-section regression results lend support to the hypothesis put forward above (Table A1.1). Specifically, a one percentage point increase in the debt-to-GDP ratio is associated with a worsening of the international institutional rating by 0.38 points for countries with a “low” domestic debt share, but only by 0.13 points for countries with a “medium” domestic debt share.²⁴ Results on the emerging market sub-sample indicate a similar pattern, although the estimated coefficients are slightly smaller.

Countries maintaining a larger share of their liabilities as domestic are more likely to command investor confidence and, hence, sustain higher levels of debt going forward. This relationship, however, may not hold at debt levels for which the debt composition can no longer be taken as exogenous (e.g., if debt levels begin to explode and trigger expectations of high inflation, prompting investors to restructure their portfolios away from nominal government bonds toward real or foreign currency assets).

²² These ratings, which are published semi-annually, are based on information provided by sovereign risk analysts and economists working at financial institutions that invest globally.

²³ This approach mimics that employed by Reinhart et al. (2003), who also use institutional investors' sovereign ratings as the preferred measure of perceived creditworthiness, with regressors including government debt-to-GDP, external debt-to-GNP, inflation, and record of past debt defaults.

²⁴ The results suggest that for countries with very high shares of domestic debt (DDINT=2), increases in the debt-to-GDP ratio can lead to rating upgrades. A plausible explanation for this could be that higher local bond issuance in very low-debt countries could raise domestic debt market liquidity, thus boosting its attractiveness to investors.

Table A1.1. Debt and its Composition as Determinants of Institutional Investor Sovereign Ratings 1/

Advanced and Emerging Economies 2/			
Variable	Coefficient	Std. error	t-statistic
PCGDP (US\$ thousands)	0.70	0.14	5.12***
DEBT_GDP (in percent)	-0.39	0.07	-5.39***
DEBT_GDP × DDINT	0.25	0.04	6.41***
Constant	58.00	3.86	15.01***
No. of observations: 60			
Adj. R-squared: 0.66			
Emerging Economies Only 3/			
Variable	Coefficient	Std. error	t-statistic
PCGDP (US\$ thousands)	0.48	0.16	3.06***
DEBT_GDP (in percent)	-0.25	0.10	-2.54**
DEBT_GDP × DDINT	0.16	0.05	3.36***
Constant	48.63	5.35	9.09***
No. of observations: 38			
Adj. R-squared: 0.41			

*** significant at 1 percent; ** significant at 5%

- 1/ The dependent variable is institutional investor sovereign ratings as at March 2005. Regressors are per capita PPP GDP (in US\$ thousands), government debt-to-GDP ratio (in percent), and its interaction with DDINT, a trichotomous indicator variable that takes the value 0 when a country's domestic debt share lies in the lower tertile, 1 when it lies in the middle tertile and 2 when it lies in the upper tertile. DDINT tertile cut-offs are 30 and 73 percent for the full sample; and 23 and 49 percent for the sub-sample of emerging economies.
- 2/ The coefficient on DEBT_GDP is -0.39 for countries in the lowest domestic debt share tertile (corresponding to DDINT=0). It falls to -0.14 for countries in the middle tertile (DDINT=1) and to +0.11 in the upper tertile (DDINT=2).
- 3/ The coefficient on DEBT_GDP is -0.25 for countries in the lowest domestic debt share tertile. It falls to -0.09 for countries in the middle tertile and to +0.13 in the upper tertile.

Appendix II. Illustrative Pension Simulations for 2010-2030

This appendix elaborates on the methodology and assumptions behind the illustrative simulations—reported in the main text—that aim at stabilizing, between 2010 and 2030, pension expenditure as a percent of GDP in the EU-27 countries.

Methodology for computing pension expenditure

The formula below is derived from the identity that states that total pension spending of a typical Pillar I pension scheme is equal to the number of pensioners multiplied by the average gross pension:

$$\text{Pension Expenditure-to-GDP Ratio} = C * B * E * D, \quad (1)$$

where the coverage ratio (C) is the number of pensioners divided by the population over 65 years of age; the benefits ratio (B) is the average gross pension divided by the average gross wage in the economy; the inverse of employment ratio (E) is given by the population between 15 and 64 years of age divided by the number of workers; and the old-age dependency ratio (D) is the population over 65 years of age divided by the population between 15 and 64 years of age.

Projections for the EU-27 countries between 2010 and 2030

Table A2.1 shows the projected increase in pension spending as a share of GDP in the EU-27 countries as a result of expected changes in the right-hand side variables of Equation (1) as reported in the 2009 Ageing Report (European Commission, 2009b). Between 2010 and 2030, pension spending would increase by about 1½ percent of GDP given that the projected increase in the dependency ratio (by about 40 percent) would be only partially offset by declines in the benefits ratio (8 percent), inverse of employment ratio (3 percent), and coverage ratio (14 percent).

What needs to change to stabilize the pension spending-to-GDP ratio at 2010 levels?

To offset the projected deterioration of 1½ percent of GDP by changing a single parameter at a time under the control of policy makers, the following would be needed:

- Decreasing further the coverage ratio and inverse of employment ratio, which could be obtained by raising over time the effective retirement age by an additional 1½ years. (This calculation is based on the assumption that all potential pensioners will work and the benefits ratio will stay constant.) As the average retirement age in EU-27 countries is already projected to increase from 61¼ years in 2010 to 62¾ in 2030 under the baseline, the average retirement age in 2030 would have to reach 64¼ years.

- A reduction in the benefits ratio (B) through a reduction in net pensions (from 2010 levels) of about 25 percent. As the baseline already includes an 8 percent decline by 2030, an additional 16 percent decline would be required to stabilize pension spending as a share of GDP at 2010 levels.
- Raising the average contribution rate by 2½-3 percentage points. This lower bound of this range assumes that the wage share in GDP will remain at 60 percent (about the average for EU countries in the past decade); if the wage share declines over time to, say, 50 percent, the required rate increase would be about 3 percentage points.

Table A2.1. EU-27 Countries: Illustrative Pension Simulations, 2010–2030
(In percent of GDP)

	Baseline	Simulations	
		(A)	(B)
Pension expenditure in 2010	9.1	9.1	9.1
Change in pension expenditure due to changes in:			
- coverage ratio	-1.3	-2.6	-1.3
- benefits ratio	-0.8	-0.8	-2.3
- inverse of employment ratio	-0.3	-0.5	-0.3
- old age dependency ratio	3.9	3.9	3.9
Pension expenditure in 2030	10.6	9.1	9.1

(A) Additional increase in retirement ages by 1.5 years.

(B) Additional decline in net benefits by 8 percent.

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