Fiscal Affairs Department

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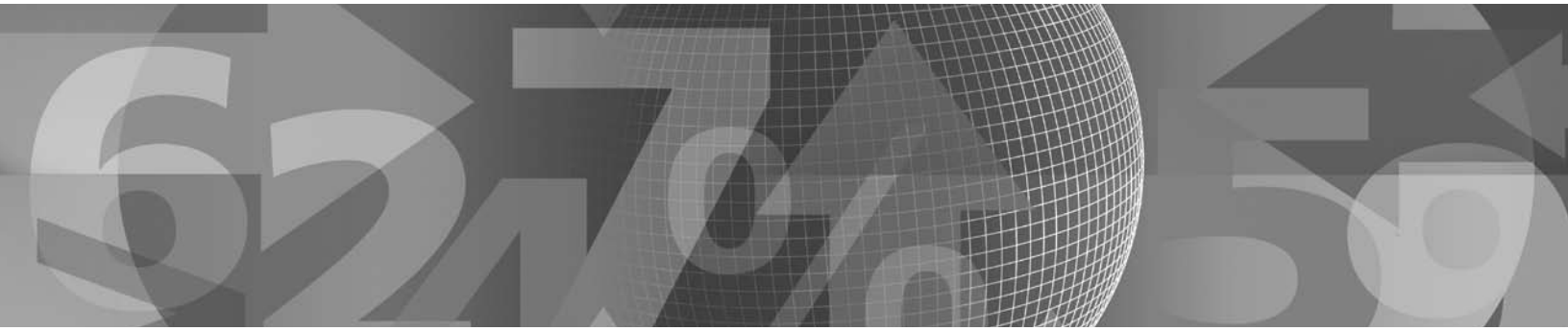

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Preface

Strategies for Fiscal Consolidation in the Post-Crisis World was prepared in response to the strong interest among IMF member countries in the scale and composition of the fiscal adjustment that will be needed, particularly in advanced economies, once the economic recovery is securely under way. It was presented at an IMF Executive Board seminar in February 2010 that discussed more broadly exit strategies from crisis intervention policies.

The paper is the product of a team led by Ricardo Velloso and comprised of S. M. Ali Abbas, Olivier Basdevant, Stephanie Eble, Greetje Everaert, Jan Gottschalk, Fuad Hasanov, Junhyung Park, Cemile Sancak, and Mauricio Villafuerte (all from the IMF's Fiscal Affairs Department, FAD). The work was overseen by Paolo Mauro. Helpful inputs and comments were provided by many colleagues in FAD (in particular, Ben Clements, Carlo Cottarelli, Phil Gerson, Izabela Karpowicz, Mauricio Soto, Anita Tuladhar, and Abdoul Wane) and in other departments within the IMF. The authors also benefited from excellent editorial support by Katia Chen.

CHAPTER

1 Introduction

The global economic crisis resulted in the greatest deterioration of fiscal accounts since World War II. In response to the crisis, government budgets provided substantial support for aggregate demand and for the financial and other key sectors. In the process, fiscal balances deteriorated, government liabilities expanded, and risks of future losses increased.

Although this fiscal activism cushioned the adverse effects of the crisis, it is now necessary to articulate a strategy to ensure the sustainability of 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.

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 there are historical precedents for overcoming it: a set of ambitious but attainable policies can be identified to deliver the required adjustment. Letting fiscal stimulus measures expire is only 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 country-level circumstances, including societal preferences, will shape the

composition of the adjustment and its political feasibility, in many cases restoring fiscal sustainability will require not only addressing with greater vigor pre-existing long-term challenges in health care and pensions, but also reforms to reduce other spending and increase tax revenue as a share of output.

CHAPTER

2 A Daunting Fiscal Challenge

The crisis has resulted in a major increase in fiscal deficits and government debt 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 2.1). By 2014, debt ratios will be close to or exceed 85 percent in all G7 economies, except Canada. Reversing this debt buildup will be a daunting fiscal challenge:

- The scale of the problem is unprecedented in peacetime. Indeed, government debt in the G7 countries is now as high as in the early 1950s, in the immediate aftermath of World War II (Figure 2.2). Major government debt increases occurred in the 1930s, but starting from lower levels (for example, U.S. federal government debt was 16 percent of GDP in the late 1920s). Moreover, demographic trends were favorable in the 1930s but are unfavorable now: fiscal pressures from an aging population will add significantly to the fiscal challenge of advanced economies over coming decades.

- The fiscal problem will improve only in part with economic recovery. By 2014, the output gap is projected to be close to zero. Yet primary deficits, although 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: (1) Even before the

crisis, structural primary balances were weak. (2) In some countries, there has been an underlying increase in spending unrelated to the crisis. And (3) some revenue losses (those related to a decline in potential output and lower tax payments from the financial sector) are expected to be long lasting, if not permanent.

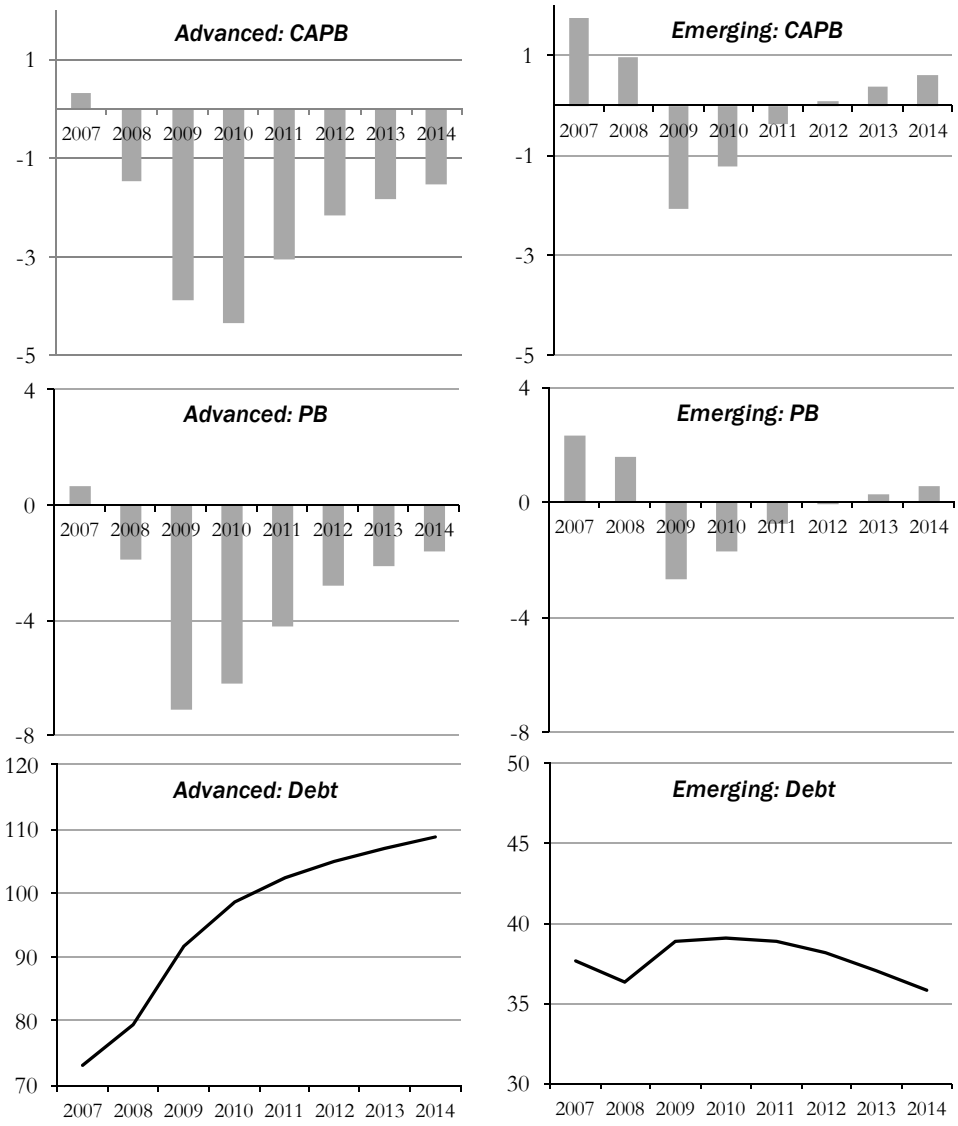
- The higher level of debt will need to be serviced in the years to come. By 2014, taking into account the likely rise in interest rates from current low levels, debt service costs are projected to increase by some 1¾ percentage points of GDP over 2007 levels. The increase in debt ratios reflects mostly 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-point projected increase in average debt ratios by 2014). Thus, the sale of assets acquired during the crisis could contribute only relatively modestly to lowering gross debt in the years ahead.

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 (Horton, Kumar, and Mauro, 2009). 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 (IMF, 2009e).

In developing countries, risks to debt sustainability, which had improved substantially in recent years, may be on the rise again. 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

Figure 2.1. Advanced and Emerging Economies: Cyclically Adjusted Primary Balance (CAPB), Primary Balance (PB), and Government Debt, 2007–14

(In percent of GDP)

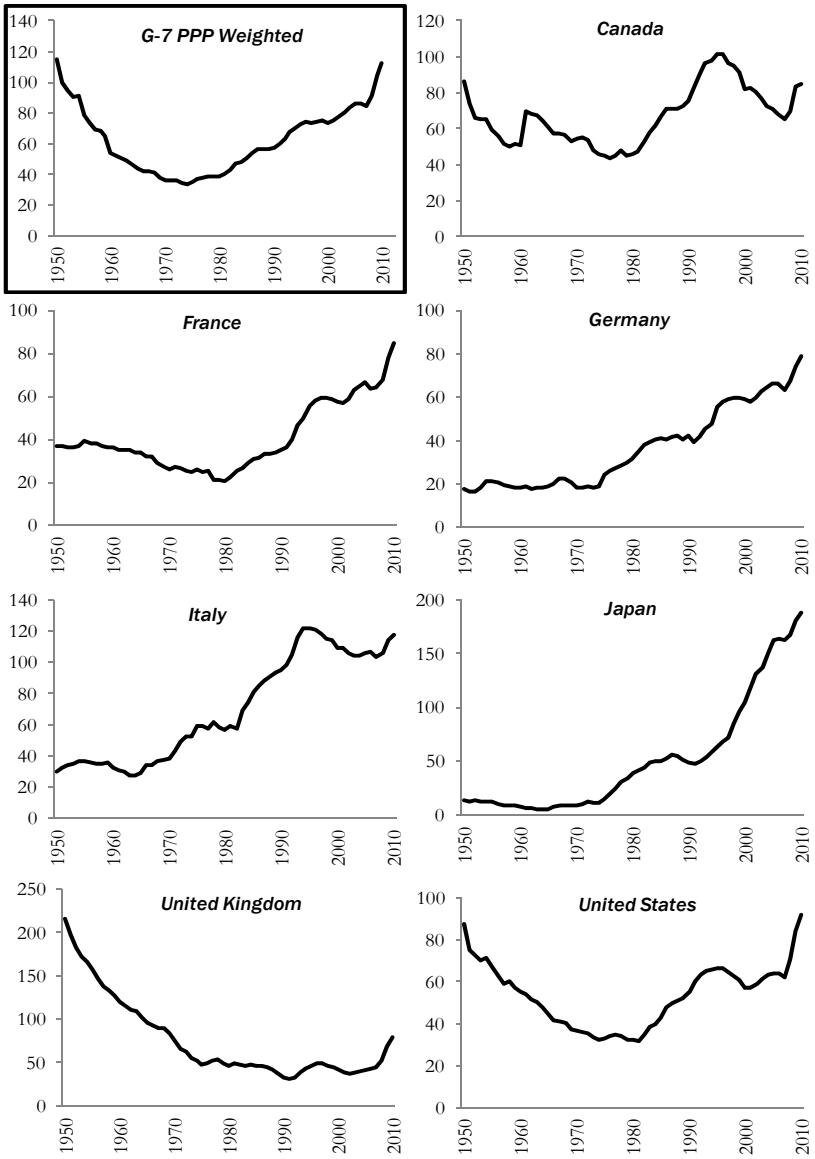


Sources: IMF, *World Economic Outlook Update* (January 2010), where available; otherwise IMF, *World Economic Outlook* (October 2009), and IMF staff estimates.

Notes: To allow for a focus on fiscal measures with direct effects on demand, the CAPB (top panel) for the United States excludes losses from financial sector support measures and 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 PB, including the costs of financial sector support measures (middle panel).

Figure 2.2. 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 (WEO) 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).

Note: PPP = purchasing power parity.

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.[1]

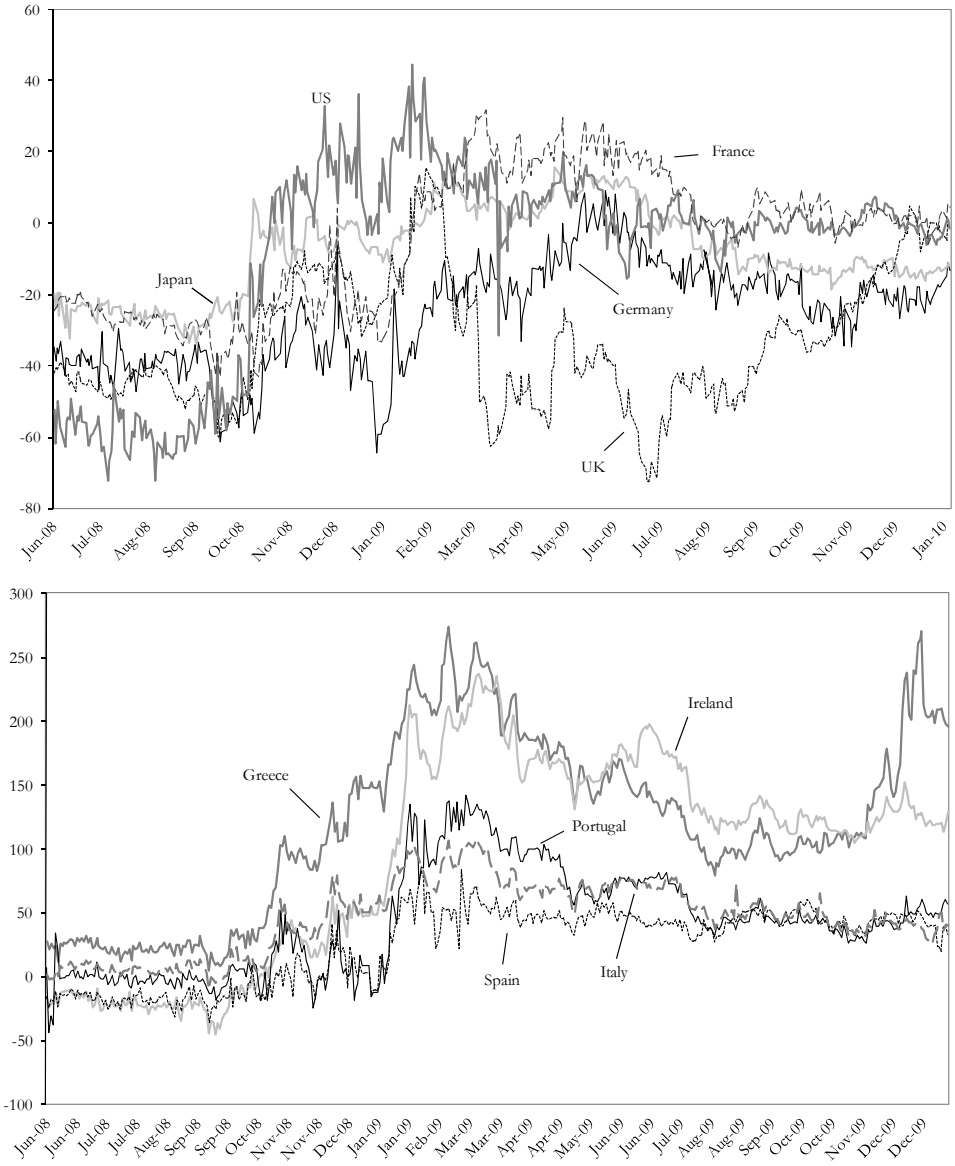
Altogether, the fiscal outlook is weaker in advanced economies, but their problems could spill over to other economies. At best, higher deficits and debt will put upward pressure on real interest rates thereby weakening growth prospects in advanced economies and elsewhere (see also the discussion in Chapter 3). At worst, the weaker fiscal outlook in advanced economies could lead to concerns that debt will be "inflated away" or that default is inevitable. If so, debt maturities would shorten, risk premia would rise, and, ultimately, refinancing crises could emerge. Indeed, as the recent crisis has demonstrated, a loss of confidence in the advanced economies 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 an appreciation of 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.

At present, financial markets do not seem to be too concerned about the weaker fiscal outlook, but this is no excuse for complacency. Although some risk premium indicators point to increased sovereign risk differentiation (Figure 2.3), 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

[1]The impact of the global crisis on developing economies and their policy reactions and challenges are discussed in IMF (2009d).

Figure 2.3. Relative Asset Swap (RAS) Spreads in Selected Advanced Economies

(In basis points)



Source: Datastream.

disequilibrium. A more favorable interpretation is that markets' contained reaction may reflect an increased supply of private savings or an expectation that policymakers 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.

CHAPTER

3 Fiscal Exit Strategies

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 using future primary surpluses.[2] 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.[3] 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, with each increase in interest rates in turn undermining public confidence in fiscal solvency, ultimately making default inevitable. Snowballing effects may arise not only as a result of high deficits and debt, 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.

[2]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.

[3]For a technical presentation of the intertemporal budget constraint, see Appendix IVb in IMF (2009b).

What Should Be the Aim of a Fiscal Exit Strategy?

In designing a fiscal exit strategy, a critical decision relates to the debt ratio target. It is obvious 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 brought down to more prudent levels. This has substantial implications for the magnitude of the needed primary adjustment, as indicated below.

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

- Although many individual countries have lived with high debt for sustained periods, the challenge in the current situation lies in the number of advanced economies that would join their ranks. Whereas in 2007 only three advanced economies had debt ratios near or above 100 percent, by 2014 this number is expected to grow to eight, accounting for the bulk of economic activity in this group (Figure 3.1). The potential effects of this 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.[4] Ultimately, potential growth may suffer.
- High debt can negatively affect growth. Italy and Japan, the G7 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 3.1). For emerging markets, some empirical studies have found evidence of debt overhang— debt levels high enough to slow growth. Preliminary econometric analysis by the IMF staff on a sample of advanced and emerging economies suggests that the size of government debt has a negative impact on per capita GDP growth: a

[4]The IMF staff recently estimated that a 1 percentage point of GDP increase in government debt leads government bond yields to rise by 5 basis points (bps). Thus, all else equal, a 35 percentage point of GDP increase in government debt would translate into about a 2 percentage point rise in interest rates (IMF, 2009e).

10 percentage point increase in the debt ratio is projected to lead to a 0.2 percentage point slowdown in annual growth.

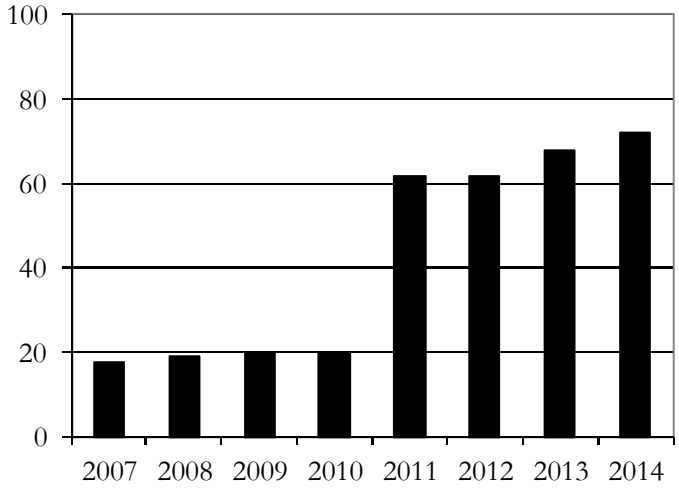
- Stabilizing debt ratios at high levels compromises the ability of fiscal policy to respond to future crises. Indeed, in some countries (for example, Italy), the response to the current crisis was constrained by high government debt.

A preferable strategy would aim to reduce 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 keep interest rates in check, foster medium- and long-term economic growth, and create room 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 (that is, the median pre-crisis debt ratio for the G20 advanced economies).

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 shares of debt that are short term, foreign currency denominated or 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 that maintain a larger share of liabilities held by domestic creditors are more likely to command investor confidence and, hence, sustain high debt going forward (Appendix 1). In the scenario outlined later in this paper for emerging economies, the 2030 debt ratio target is 40 percent (which was the median debt ratio for emerging economies in the three years preceding the recent global crisis).

Figure 3.1. Economic Weight of Higher-Debt Advanced Economies

(Percent of Total Advanced Countries' GDP)



Source: IMF, *World Economic Outlook*, and IMF staff estimates.

Elements of a Fiscal Exit Strategy

A comprehensive fiscal exit strategy should spell out the debt ratio objective and broad policies 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 also is discussed.

The role of inflation

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

Box 3.1. Public Debt and Economic Growth

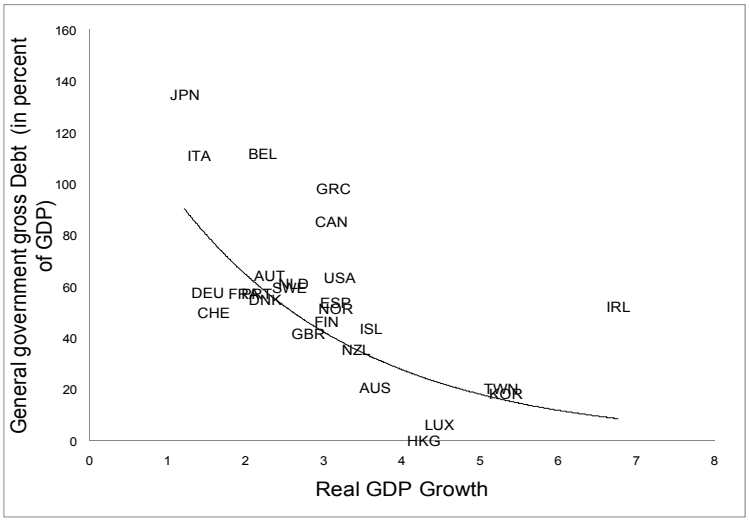
Theory suggests that high levels of public debt reduce long-term economic growth. The empirical evidence is mixed, but some points to such an effect for external debt in emerging and developing economies.

Theoretical models of long-term economic growth suggest that a reduction in national savings causes a decline in economic growth—either permanent, in an endogenous growth model, or temporary, in the Solow growth model. Thus, if lower public savings result in lower national savings (in the absence of full Ricardian equivalence), higher budget deficits can be expected to cause not only higher public debt, but also decreased long-term economic growth (Saint-Paul, 1992).

Extensive empirical literature based on cross-country growth regressions has failed to identify robust relationships between fiscal variables and economic growth, but some studies have found that external debt—up to a certain threshold—has a negative impact on economic growth in emerging and developing economies. 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 and 2004) find that debt has a nonlinear effect 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 figure 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 (except Ireland and Singapore).

Average Growth and Average Government Debt during 1992–2007, Advanced Economies



Source: IMF staff estimates.

significant than in earlier decades.[5] 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 denominated debt accounts for three-quarters of the total in advanced economies. However, long-term interest rates probably would rise with inflation, and any maturing debt would have to be refinanced at higher rates. To illustrate these effects, Table 3.1 reports the debt ratio that would prevail in 2014 for selected Organization for Economic Cooperation and Development (OECD) countries if inflation over 2009–14 turned out to be on average 6 percent as opposed to 2 percent (as projected in the April 2010 *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.

Moreover, using high inflation for debt reduction would carry major costs and risks, which argues 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 when inflation has to be brought down again. Moreover, 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.

The roles of primary balance adjustment and economic growth

A stronger primary surplus, rather than higher growth, was the main driver of the top 10 debt ratio reductions in advanced economies over the past three decades (Table 3.2). Indeed, a decomposition of debt dynamics shows that the contribution of the differential between growth and interest rates

[5]Raising inflation by 5 percentage points would increase seigniorage by about ½ percentage point of GDP on average in the G7 countries, assuming that demand for base money would not decline as inflation rose.

Table 3.1. Counterfactual Exercise: The Role of Inflation, 2009–14

	2009		2009–14	2014	
		MT-LT	Inflation,	Total debt, with average inflation equal to:	
	Total debt	debt[1]	WEO[2]	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 Update,* January 2010, and IMF staff estimates.

[1]Medium- and long-term debt in domestic currency, nonindexed.

[2]GDP deflator inflation, average over the period as projected in the January 2010 *World Economic Outlook Update.*

[3]This implies a 4.3 percentage point increase in inflation over projected average inflation of 1.7 percent.

was significant only in a few episodes of rapid growth catch-up (for example, Ireland, Norway, and Spain).[6] 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.

However, coupled with expenditure moderation, strong economic growth can make a major contribution to lowering debt ratios, which suggests growth-raising structural reforms should be part of the strategy. The

[6]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 the IMF staff envisages disentangling more clearly the interaction between growth and fiscal consolidation.

Table 3.2. Decomposition of Large Reductions in Debt-to-GDP Ratios in Advanced and Emerging Economies[1]

Episodes	Starting Debt Ratio	Debt Reduction	Ending Debt Ratio	Primary Surplus Contribution	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
Emerging Market Economies						
Inflation >= 10 percent p.a.						
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
Inflation < 10 percent p.a.						
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 database and IMF staff estimates.

[1]Figures are in percent of GDP. The episodes listed represent the largest year-to-year reductions in the debt-to-GDP ratio over the past three decades that were separated by at least 15 years. The interest rate used in the computation of the growth interest rate differential is the "effective" interest rate, calculated as the 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.

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 1 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, such as more competitive goods markets and removal of labor market and tax distortions, should be pursued with vigor, because they counteract the undesirable effects of population aging on growth and public spending.

This said, fiscal consolidation strategies should be based on conservative growth assumptions. Considerable uncertainty surrounding the magnitude and timing of the effects of structural reforms on potential growth cautions against trying to build a credible fiscal adjustment strategy primarily around an optimistic growth path.[7] 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

The size of the primary adjustment depends on key assumptions regarding the debt ratio target, the differential between interest and growth rates, and the pace of adjustment. For illustrative purposes—but consistent with the aforementioned objective of a credible fiscal exit strategy—the scenario below focuses on advanced economies and includes the following:

- A goal of lowering (gross) debt ratios to below 60 percent by 2030.[8] As noted, maximizing the recovery value of assets acquired during the crisis is important but will not materially alter the medium-term outlook,

[7]Prudence also is 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).

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

because 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.

- An interest rate–growth rate differential of 1 percentage point. This is broadly in line with the observed differential in high-debt advanced economies during 1990–2007.
- An adjustment in the primary balance that begins in 2011 and lasts for 10 years, with the primary balance maintained constant thereafter. Of course, the appropriate adjustment profile depends in part on the nature of the supporting measures. For example, early measures that affect long-term spending trends could allow a more gradual adjustment, reassuring markets that fiscal sustainability has been addressed despite a more gradual adjustment path in the near term.

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 2011–20, a fiscal effort of ¾ percentage point a year (Table 3.3a and Figure 3.2).[9] That is, the average structural primary balance has to improve from a projected deficit of 4⅓ percentage points of GDP in 2010 to a surplus of almost 3⅔ percentage points in 2020. However, there is considerable variation among countries, with fiscal consolidation needs ranging from just under ½ percentage point of GDP for Switzerland to more than 13 percentage points for Greece, Ireland, and Japan. One-fifth of advanced economies would face adjustment needs close to or larger than 10 percent of GDP; and adjustment in about two-thirds would be smaller than 5 percent of GDP. This variation is a result not only

[9]The European Commission (EC), for example, recommends that fiscal consolidation start in the EU countries in 2011 at the latest, provided the recovery is strengthening and becomes self-sustaining. In addition, 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 Stability and Growth Pact benchmark of ½ percent of GDP a year, with required adjustments in excess of 1 percent of GDP for several years in France, Ireland, Portugal, Spain, and the United Kingdom (European Commission, 2009b).

Table 3.3a. 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	-4.8	2.0	0.5	-1.6
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	-2.6	-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

Table 3.3a (*concluded)*

	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
Average (PPP-weighted)	98.3	-6.2	-4.4	3.9	8.2
G-20	105.1	-6.6	-4.7	4.1	8.8
Higher debt	106.4	-6.7	-4.8	4.3	9.1
Lower debt	32.2	-1.9	-0.7	0.3	1.1

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

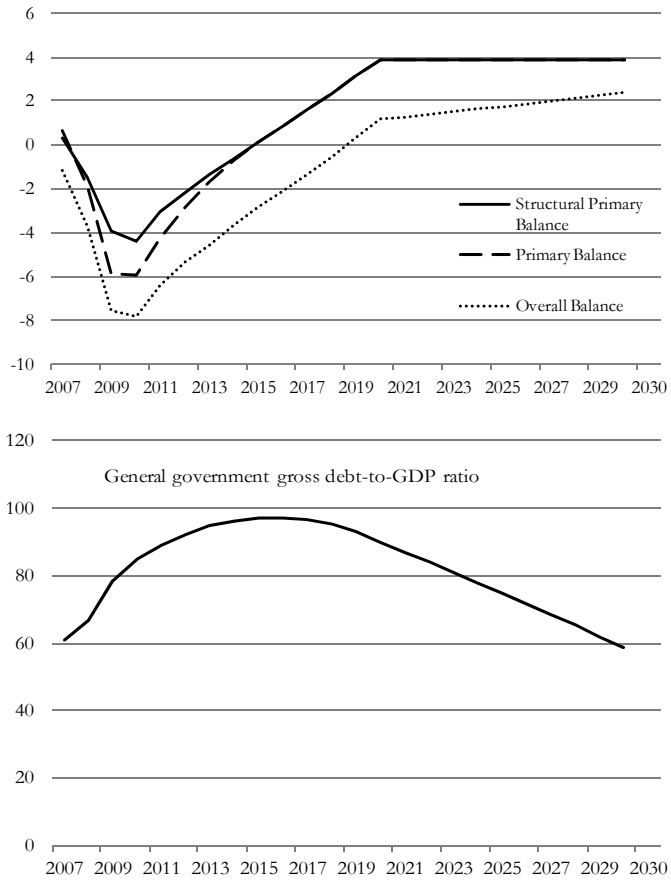
Notes: The table reports gross debt; for some countries with sizable assets, net debt is considerably smaller. Structural primary balances are reported in percent of nominal GDP. General government data are used where available. For the United States, the structural primary balance excludes losses from financial sector support. Data for Greece correspond to the October 2009 *World Economic Outlook*, and therefore do not contain measures included in the authorities' 2010 Stability and Growth Program. In the illustrative fiscal adjustment strategy, the structural primary balance is assumed to improve gradually during 2011–20; 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 denotes "lower debt") or to bring the debt ratio to 60 percent in 2030 (shading denotes "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 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.

of considerably different initial debt ratios, but also fairly distinctive initial primary balance positions. And 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 easier if potential growth increased.

Although the precise magnitude of primary adjustment required over the medium term is sensitive to assumptions, the scale of the fiscal problem is

Figure 3.2. Advanced Economies: Illustrative Scenarios for Primary Balance Adjustment and Debt

(In percent of GDP)



Sources: IMF, *World Economic Outlook Update,* January 2010; and IMF 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 figure. 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-to-GDP ratio at its end-2012 level if it is less than 60 percent; otherwise, it is set to reduce the debt-to-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.

Table 3.3b. 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	-3.8	-3.7	2.2	5.9
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	-0.1	0.3	0.4
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	-0.9	1.4	0.3	-1.1
Average (PPP-weighted)	39.2	-1.7	-1.2	1.3	2.5
G-20	37.9	-1.7	-1.4	1.3	2.7

Table 3.3b (*concluded)*

Sources: IMF, *World Economic Outlook Update,* January 2010, where available; otherwise *World Economic Outlook,* October 2009; and IMF 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 the IMF staff's assessment of the policy measures underpinning the authorities' medium-term program. For Ukraine, the primary deficit excludes costs related to bank recapitalization and gas utilities. In the illustrative fiscal adjustment strategy, the structural primary balance is assumed to improve gradually during 2011–20; 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. 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.

large for various reasonable sets of parameter values (Table 3.4). Assumptions about the differential between the rate of output growth and the interest rate have an impact on estimated adjustment needs. However, even if the differential were to fall to zero, the adjustment required for the G20 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 adjustment is more sensitive to the debt objective: stabilizing debt ratios at 2012 levels would cut the required adjustment by almost half. For reasons noted earlier, however, this less ambitious strategy has significant drawbacks.

A similar exercise conducted for selected emerging economies shows that the improvement in the structural primary balance needed to achieve a debt ratio target of 40 percent by 2030 amounts to 2½ percentage points of GDP during 2011–20 (Table 3.3b). However, unlike advanced economies, many emerging economies have room to ease the fiscal stance—from projected

Table 3.4. Required Adjustment of Structural Primary Balance: Sensitivity to Variations in Interest and Growth Rates ($r-g$) and Debt Targets

(In percent of GDP)

	Required Adjustment of Structural Primary Balance Between 2010 and 2020		
	$r-g$		
2030 Debt Target	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 Update,* 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 improve gradually through 2020 and stay 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 (weighted according to purchasing power parity), 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-to-GDP level below 60 percent in the first exercise (or below 80 percent in the second exercise), illustrative scenario is based on a primary balance path needed to stabilize the debt-to-GDP ratios at their end-2012 levels. "$r-g$" indicates the assumed difference between the interest rate and the rate of economic growth.

2010 levels—to stabilize debt ratios at or below 40 percent.[10] At the same time, driving debt ratios to below 40 percent by 2030 would require significant fiscal consolidation in Egypt, India, Malaysia, and Poland.

This magnitude of fiscal consolidation has several historical precedents at the individual country level. Although this will be the first time most advanced economies have to undertake a simultaneous adjustment of such a large magnitude, more than 20 advanced and 30 emerging economies experienced large fiscal adjustments (that is, adjustment in the structural primary balance of at least 5 percent of GDP) at least once over the past four decades (Tables 3.5a, 3.5b, and 3.6), and 10 advanced economies and 12 emerging economies experienced fiscal adjustments larger than 10 percent of GDP.[11] In addition, as shown in Figure 3.3, most of those economies were able to contain significantly annual primary spending growth—which averaged just over 1 percent in both advanced and emerging economies—during the fiscal adjustment period.

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 3.3 illustrates that, even though the primary balance adjustment would be complete by 2020, it would be necessary to maintain the 2020 primary surplus for 10 years to reach the debt ratio target 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 have been appropriate. However, considering the 10 countries with debt ratios

[10]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.

[11]Another piece of evidence that large fiscal consolidations are feasible stems from the estimation of a fiscal policy reaction function, which finds 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 what is observed at lower debt levels (Callen and others, 2003).

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?

Not renewing stimulus measures will improve the primary balance by 1½ percentage points of GDP on average. Removing fiscal stimulus should be relatively easy from a technical perspective, because most stimulus packages included to a large extent time-bound measures (for example, of 60 percent by 2030. Tables 3.5a and 3.5b show that in many countries the investment and one-time tax rebates) or explicit sunset provisions. Altogether, an estimated four-fifths of G20 countries' fiscal stimulus is temporary (IMF, 2009e). Still, removing fiscal stimulus is only one component of the needed 8 percentage point adjustment envisaged by the above scenario.

Fiscal structural reforms will also be needed and must reflect specific country circumstances. In this respect, two features are particularly relevant: first, 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; and second, pressures from population aging imply that entitlement spending will have to be reformed in many countries.

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 and others (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 multiyear priorities and build credibility. Box 3.2 reviews existing studies on the composition of large and successful fiscal adjustments.

Table 3.5a. 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
Advanced economies							
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 IMF staff estimates.

Notes: The cumulative change in the cyclically adjusted primary balance (CAPB) is 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 the largest adjustments for each country, unless episodes for a given country do not overlap. For Hong Kong SAR, further adjustment through 2007, as a result of asset price effects, is not taken into account.

Table 3.5b. 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
Emerging economies							
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

Table 3.5b (*concluded)*

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
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 IMF staff estimates.

Notes: The cumulative change in the cyclically adjusted primary balance (CAPB) is 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 each country's largest adjustments, unless episodes for a given country do not overlap.

Reforming pension and health entitlements will be critical. This spending already represents a sizable share of total spending (for example, more than one-third of total spending in the G7 countries), and the net present value of future spending increases due to aging is estimated at more than 10 times the fiscal cost of the crisis (IMF, 2009c). Absent significant reform, spending on pensions and health care could rise by 4 to 5 percentage points of GDP by 2030.[12] Action to arrest such a trend is politically difficult, but the effects 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 balance could then be targeted. In addition, some measures can have powerful effects: for example, an IMF

[12]According to IMF staff estimates. For EU countries, health care costs are based on the *Ageing Report* (EC, 2009a), but using its less optimistic scenario for the growth of health care costs. (The EC's baseline projection is regarded 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 recent decades.) For other countries, official government projections are used when available. For pensions, baseline projections from the EU are used, and official government projections are used for other countries when available.

Table 3.6. Fiscal Adjustment Episodes: Average Cyclically Adjusted Primary Balance (CAPB)[1]

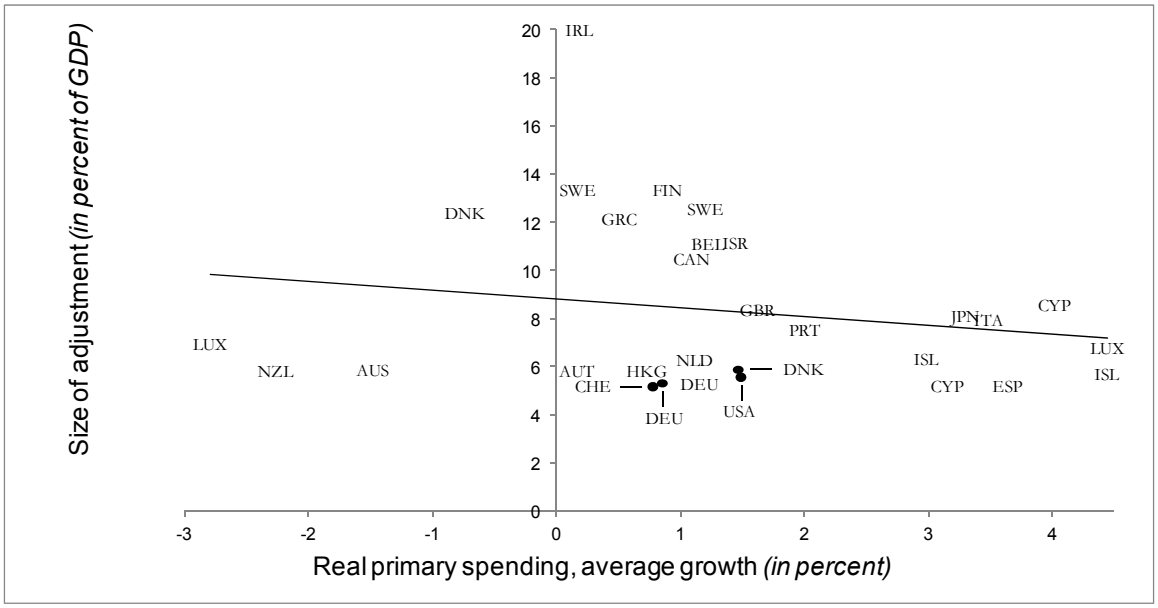
CAPB	4 Years	5 –7 Years	8 –10 Years	11–13 Years	14–15 Years
2–3		Uruguay (2002–08; 46.4); Peru (2002–08, 25.6); Sweden (1975–91); Japan (1976–92, 73.0); Pakistan (1999–2004; 67.8); Malaysia (1995–2000, 35.3); Lebanon (2003–08, 162.5); Bulgaria (2001–05, 31.3); Cyprus (1993–97, 87.5); United Kingdom (1997–2001, 37.7)	Tunisia (1986–95, 58.5); Argentina (1999–2008); Australia (1997–2006, 9.6); Columbia (2000–08, 30.4); Spain (1999–2007, 36.2); Switzerland (2000–07, 44.3); United States (2001–08, 55.5)	Morocco (1987–99, 72.0); Indonesia (1994–2006, 39.0); Iceland (1995–2007, 28.7); Austria (1976–88, 57.3); Hungary (1990–2001, 52.1)	Egypt (1992–2006, 98.8); Jordan (1989–2003, 99.6); Israel (1980–94, 109.6); Panama (1994–2008, 40.8); Mexico (1987–2001, 44.3); Chile (1992–2006, 5.3); Brazil (1994–2008, 64.5); South Africa (1994–2008, 27.3); New Zealand (1985–99, 33.8); Turkey (1994–2008, 39.5); Ireland (1986–2000, 37.8); Finland (1976–90, 14); Canada (1994–2008, 63.6); Netherlands (1993–2007, 45.9); Luxembourg (1988–2002, 6.5); Italy (1993–2007, 103.5); Denmark (1991–2005, 36.4); Belgium (1983–97, 122.3); Hong Kong (1984–97); Greece (1994–2007, 94.8)
3–4	Jamaica (1983–86); Peru (2005–08, 25.6)	Hungary (1995–2001, 52.1); Argentina (2002–08); Tunisia (1985–90); St. Lucia (1985–90); Netherlands (1996–2001, 50.7); Morocco (1990–94, 78.7); Malaysia (1995–99, 36.9); Iceland (2003–07, 28.7); Sweden (1986–90); United States (1997–2001, 55.5)	South Africa (1998–2007, 28.5); Greece (1994–2003, 98); Jordan (1989–97, 113.4); Austria (1976–84, 46.2); Costa Rica (1991–98, 16.8)	Canada (1995–2007, 64.2); Bulgaria (1997–2008, 16.7); Egypt (1992–2003, 114.8); Finland (1997–2008, 33.4); Brazil (1998–2008, 64.5)	Romania (1980–94); Israel (1984–98, 101.4); Barbados (1991–2005, 79.36); Panama (1983–97, 67.2); Mexico (1986–2000, 45.5); Chile (1994–2008, 3.4); New Zealand (1989–2003, 25.8); Ireland (1988–2002, 32.2); Luxembourg (1987–2001, 6.5); Denmark (1986–2000, 51.5); Belgium (1985–99, 113.7); Turkey (1994–2007, 39.4); Italy (1992–2005, 105.8);
4–5	St. Lucia (1987–90); Iceland (2004–07, 28.8)	Greece (1994–2000, 103.4); Finland (2000–06, 39.2); Jordan (1989–94, 136.7); Brazil (2001–06, 63.7); Austria (1976–81, 37.6); Luxembourg (1996–2001, 6.5); Hungary (1996–2000, 53.9); Tunisia (1985–89); Jamaica (1983–87); Argentina (2002–06)	Egypt (1992–2001, 83.2); Turkey (1999–2008, 39.5); Ireland (1991–2000,37.8); Barbados (1991–99, 59.1); Denmark (1998–2006, 30.6); Canada (1996–2003, 76.6); Italy (1993–2000, 109.2)	Panama (1985–97, 67.2); Romania (1980–91); Chile (1987–97, 13.6)	Bulgaria (1994–2008,16.7); Israel (1985–99, 95.3); Mexico (1983–97, 47.6); New Zealand (1993–2007, 58.4); Belgium (1992–2006, 87.7)
5–10	Panama (1989–92, 89.9); Canada (1997–2000, 82.1); Italy (1997–2000, 109.2); Tunisia (1986–89); Austria (1976–79, 34.2)	Turkey (2000–06, 46.1); Chile (2003–08; 3.4); Jamaica (1983–88); New Zealand (1993–98; 36.4); Barbados (1991–95; 67.4); Denmark (1985–89; 69.7)	Romania (1982–89); Egypt (1993–2000; 75.4)	Mexico (1983–95, 40.8); Israel (1983–94, 109.6)	Belgium (1990–2004, 94.5); Jamaica (1992–2006, 94.3); Bulgaria (1994–2007; 19.8)
10 and above	Israel (1985–88, 141)				Jamaica (1986–2000, 103.4)

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

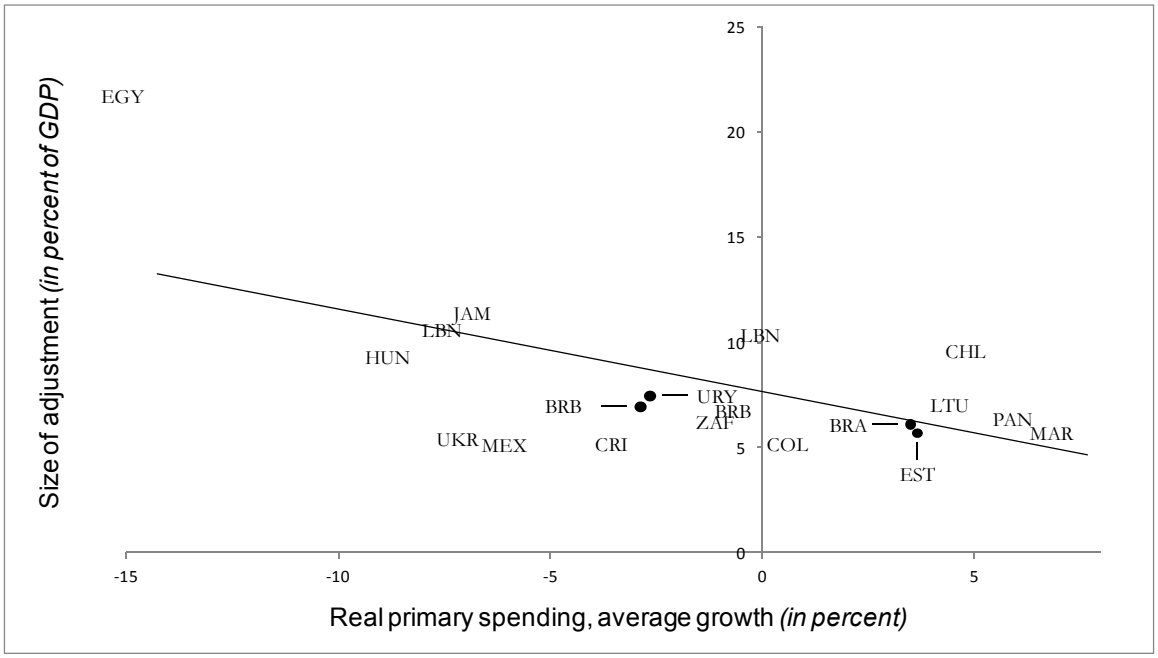
[1]The first variable in parentheses shows the years of the episode, and the second variable shows the debt-to-GDP ratio at the end of the episode. The table lists the largest adjustment for each country.

Figure 3.3. Fiscal Adjustment and Real Primary Spending Growth during Adjustment Episodes

Advanced economies



Emerging economies



Source: IMF, World Economic Outlook database.

Notes: Fiscal adjustment episodes are listed in Tables 3.5a and 3.5b, respectively. Size of adjustment refers to cumulative improvements in the cyclically adjusted primary balance during the entire adjustment episode.

staff analysis suggests that a one-year increase in the retirement age in G20 advanced economies could save almost 50 percent of GDP in net present value terms.[13] However, given the strength of demographic factors, entitlement reforms would, at best, prevent population 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.

Reforms aimed at stabilizing entitlement-spending-to-GDP ratios are ambitious but attainable. For example, simulations presented in Appendix 2 illustrate the magnitude of policy changes consistent with stabilizing pension expenditures as a share of GDP in the EU27 countries over the next 20 years: (1) increasing the retirement age by one and a half years (in addition to the projected increase of one and a half years under the baseline); (2) cutting (net) pensions by an additional 16 percent (from a projected decline of 7½ percent assumed under the baseline); or (3) raising contribution rates by 2½ to 3 percentage points. Recent pension reforms in some advanced economies suggest that policies and savings of the required magnitude are not unprecedented (Box 3.3). An even more challenging area is health care reform, including as a result of stronger political pressures.

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.[14] With a pre-crisis ratio of about

[13]Moreover, some measures could, at least in principle, have a positive effect on output. Extending the working life of the population 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, with a shorter retirement period, a reduced need to save.

[14]In the United States, 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 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.

Box 3.2. Large and Successful Fiscal Adjustments: Lessons from the Literature

The composition of fiscal adjustment matters—expenditure-based adjustments are longer lasting and elicit more non-Keynesian growth responses.

- Successful adjustments (those that yield lasting public debt reduction) emphasize cuts in primary expenditures, especially government wages and transfers, over tax increases (Alesina and Perotti, 1995; McDermott and Wescott, 1996; Alesina and Ardagna, 1998 and 2009; Tsibouris and others, 2006). However, there is a role for revenue as well. In Organization for Economic Cooperation and Development 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 during 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 low-income countries and in some emerging economies—also has contributed to successful adjustments (Gupta and others, 2003; Ardagna, 2004; Tsibouris and others, 2006).
- Fiscal contraction has been more likely to raise output when cuts focus on government wages (Ardagna, 2004) or transfers (Alesina and Perotti, 1996; Alesina and Ardagna, 2009). Similarly, during expansionary fiscal contraction episodes, income taxes were lowered, whereas during contractionary episodes income taxes were increased (Alesina and Ardagna, 2009).

Although the phasing in 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, there is limited evidence on whether a multiyear adjustment should be gradual or upfront. For a broad set of countries, Tsibouris and others (2006) shows a broad balance between upfront and gradual approaches among successful adjustments. However, back-loaded adjustments in a sample of emerging economies were found to be more successful in reaching, but not maintaining, sustainability (Baldacci and others, 2006). Duration studies (von Hagen, 2001; Tsibouris and others, 2006) typically point to adjustment fatigue, in that longer adjustment periods increase the probability that the adjustment comes to an end.

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 and others, 2006; von Hagen, 2001). Challenging initial conditions often help policymakers 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 consolidation has typically been accompanied by structural reforms—several countries established medium-term expenditure frameworks, introduced fiscal rules, and/or reformed intergovernmental fiscal arrangements (IMF, 2009b).

23 percent between primary spending (excluding pension and health care 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 prioritizing expenditures and enhancing the cost-effectiveness of public spending would be helpful in this regard. Eliminating energy subsidies is an area of considerable potential savings. In implementing these expenditure reforms, it will be important to protect the poor and the unemployed. This is desirable on equity grounds and would also enhance the social and political sustainability of the overall strategies.

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 3.7). To that end, there is an important role for broadening the tax base by fighting tax evasion while reducing exemptions or increasing coverage. However, depending on the needed strength of the adjustment, the initial size and efficiency of the public sector, 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 structure are likely to become more relevant than in the past, with externality-correcting taxes ranking among the highest priorities.[15]

[15]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 a 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.

Box 3.3. 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 amount to more than 2 percentage points of GDP by 2030 and 3 percentage points by 2050. The table presents gross public pension expenditures as a share of GDP in 2030 as projected in 1995 and 2005 for selected countries that undertook significant reforms during that period.

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 implemented mainly 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 was raised, and the limit for early retirement lowered; 2003–05 reforms—the effective retirement age was raised, and an actuarial reduction was applied to those retiring before age 63. The ceiling on the maximum pension was abolished. Pension benefits are calculated on the basis of lifetime earnings.
- Germany, 1992–2001 reforms—the transition period of the increase of the statutory retirement age was shortened several times. Pensions were reduced in the case of early retirement; 2001–04 reforms—the 2001 reform promoted supplementary pension schemes while reducing slightly the target replacement ratio (the replacement rate also was reduced in 1997). The 2004 reform introduced a sustainability factor into the pension indexation formula by maintaining a fixed ratio between the number of beneficiaries and contributors (dependency ratio).
- Italy, 1995 reform—the reform replaced the existing defined-benefit system with a notional defined-contribution system. Furthermore, it tightened the conditions governing seniority, disability, and survivors' pensions and broadened the contribution base; 2004 reforms—as of 2008, the early pension option was tightened, and age limits were raised.

Box 3.3 *(concluded)*

- Spain, 2002–05 reforms—the mandatory retirement age was abolished. After the age of 65, the accrual of pension rights was increased and contributions abolished. Early retirement is discouraged by a reduction in contribution rates. Moreover, pension benefits have been reduced and are tied to the number of contribution years.
- Sweden, 1998 reforms—a notional defined-contribution plan and indexation to life expectancy and GDP growth were introduced in 1999. Under the new system, it is possible to retire at age 61, with actuarially equitable compensation for those who decide to stay in the labor force. Every year of contribution is included in the calculation of pension benefits. For a person receiving an average wage, yearly pension benefits increase by nearly 60 percent if retirement is postponed until age 67 (compared with leaving the work force at age 61).

Institutions and arrangements to support fiscal consolidation

Strong budget institutions also will be needed to support fiscal consolidation. Budgetary institutions and arrangements can play a key role in the three main stages of the fiscal policymaking process:

- 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, which must 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 (for example, population aging, climate change). Moreover, comprehensive disclosure and management of fiscal risks help 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 (1) a commitment to a transparent medium-term fiscal objective or rule that provides sufficient flexibility to accommodate unforeseen shocks; (2) a medium-term budget framework that translates fiscal objectives into a clear plan for the evolution of public spending by

identifying the future costs of new policy initiatives and setting multiyear ceilings on future spending commitments; and (3) 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 that ensures that budgets are prepared in a manner consistent with the government's overarching fiscal objectives. Procedures for budget approval 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 the flexibility needed to manage contingencies and the discipline required to ensure that the government's consolidation plans are respected and delivered.

A review of current practices suggests that most countries, in varying degrees, need to strengthen their budgetary institutions and arrangements. Such improvements are critical, given the magnitude of future fiscal challenges 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 also exist in emerging and advanced economies, including gaps in institutional coverage and general lack of balance sheet information. Moreover, despite increased disclosure of fiscal risks , comprehensive reporting is still limited: few countries include a statement of fiscal risks in their budget documents, and risk analysis often focuses only on formal guarantees. Similarly, most countries do not yet produce reports on long-term fiscal challenges and, among those that do, few include multiple scenarios.
- Medium-term fiscal objectives. Although many countries articulate medium-term fiscal objectives or rules, their effectiveness as a guide for

Table 3.7. Required Improvement in the Primary Position, 2011–20
(In percentage points of GDP)[1]

Cyclically adjusted primary balance in 2010	–4⅓
Cyclically adjusted primary balance in 2020	3⅔
Improvement in the cyclically adjusted primary balance	8
Allowing fiscal stimulus to expire	1½
Freeze in real spending except pension and health care	3½
Tax increases	3
Memorandum item:	
Measures to keep health care and pension spending constant in relation to GDP[2]	4–5

Source: IMF staff estimates.

[1]Improvement in the cyclically adjusted primary balance (CAPB) of advanced economies needed to lower the general government gross debt below 60 percent (Japan: below 80 percent for net debt) by 2030, assuming the primary improvement takes place during 2011–20 and the primary surplus is maintained at its 2020 level in relation to GDP for the following 10 years. The average CAPB during 2011–29 would be 2½ percent of GDP (3¾ percent of GDP during 2015–29).

[2]If no measures are introduced, health care and pension spending will rise by 4 to 5 percentage points of GDP over the next two decades. Measures to offset that amount would be required to maintain health care and pension spending constant as a share of GDP.

fiscal policymaking often is limited by ambiguities regarding precise target values or time horizons.[16] Furthermore, these objectives are not always supported by the kinds of comprehensive and binding medium-term budget frameworks needed to translate those objectives into detailed plans for the future evolution of revenue and expenditures. Finally,

[16]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 in many cases implementation of the rule was delayed until after completion of the initial phase of the fiscal consolidation—to lock in fiscal gains and guard against reform fatigue (IMF, 2009b).

independent validation of the macroeconomic assumptions and fiscal judgments underpinning the government's fiscal strategy remains the exception in advanced and emerging economies.

- Budget preparation and approval. Budget preparation follows a top-down procedure in an increasing number of countries, but budgetary rigidity and circumvention of the budget process diminish its disciplinary impact, particularly in low-income countries. Arrangements for controlling multiyear expenditure commitments and for dealing with contingencies in the course of budget execution remain in most cases insufficient, endangering the delivery of consolidation plans.

The design and implementation of strategies for the management of government assets and liabilities also should support fiscal exit strategies. There are various aspects to be considered in this context.[17] Regarding government *liabilities*, in light of increased debt stock and the possibility that interest rates will rise with economic recovery, there is a need to optimize the structure of liabilities—in many cases, lengthening debt maturities to limit vulnerability. In addition, strategies will be needed 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 the quasi-fiscal costs taken on by such entities, particularly 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,[18] as well as divestiture of other assets held before the crisis,[19] should

[17]For a broader discussion, see IMF (2009a).

[18]Proper management and disposal of financial assets acquired during the crisis can make a small but not insignificant contribution to the reduction of government debt (perhaps on the order of 2 to 3 percentage points of GDP for advanced economies, against an initial investment of 4 percentage points of GDP).

[19]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 OECD (2005); in most cases the data refer to enterprises owned by the central government).

be considered as a means of reducing gross government debt (and the size of government balance sheets). Country authorities may occasionally face a trade-off between reselling assets to the private sector as soon as acquired banks or companies return to profitability and a more gradual approach that might ultimately yield larger gains to the government's budget.

Further progress in institutional arrangements thus would help underpin fiscal consolidation efforts. The IMF staff is engaged in further analysis of the institutional determinants of effective consolidation in an attempt to better gauge the strength of existing institutions and, ultimately, to refine recommendations regarding areas of institutional vulnerability that should be addressed in fiscal consolidation strategies.

APPENDIX

1 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 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 typically are either citizens with voting rights or systemically important institutions such as banks—as opposed to foreign investors (Bolle, Rother, and Hakobyan, 2006; Drazen, 1997). 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 foreign debt servicing 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; Bohn, 1988).

At the same time, the "original sin" literature highlights domestic debt issuance as an outcome rather than a 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) find themselves effectively consigned to issuing short-term, indexed, or foreign currency debt (Eichengreen and Hausmann, 2005). By analogy, however, governments that 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 positive association of such debt composition with debt sustainability.

Data and empirical methodology

Empirical pursuit of this question typically has been constrained by a lack of good-quality time-series data on domestic debt. Although in the past few years some useful cross-country data sets have emerged, 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 (for example, local currency debt, nonindexed debt, debt

issued to domestic residents, debt held by domestic residents, 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 and others (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.[1] A simple cross-plot of the March 2005 institutional investor sovereign ratings (index from zero to 100, with higher values indicating more favorable ratings) against the domestic debt share (in government debt, at end-2004) reveals a strong positive relationship, albeit unconditional (Figure A.1.1).[2]

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

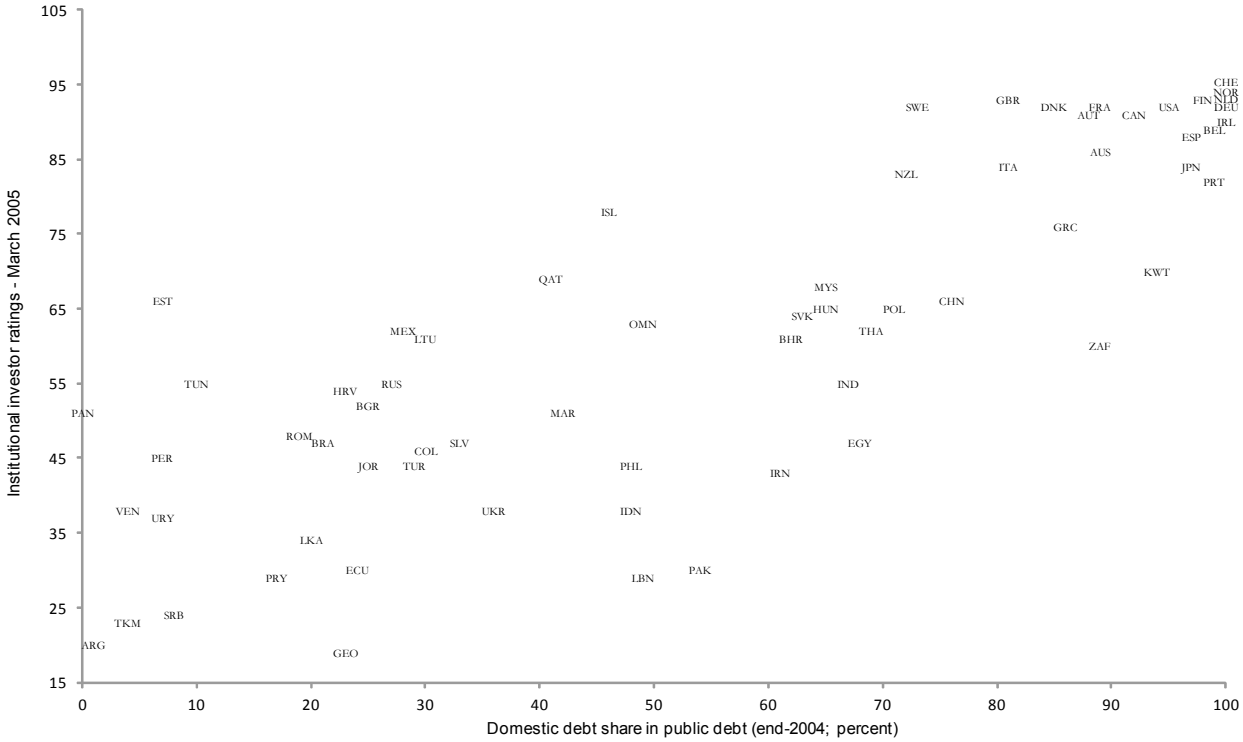
$$IIR_i = \alpha + \beta\ DEBT\_GDP_i + \gamma\ DEBT\_GDP_i^{*}DDINT_i + \phi\ PCGDP_i + \varepsilon_i,$$

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

[1]This exercise was also conducted for (1) end-2007, using Bank for International Settlements data (which cover a narrower list of countries) and (2) 2004, using a sample including low-income countries from Abbas and Christensen (2010). The results are robust.

[2]These ratings, which are published semiannually, are based on information provided by sovereign risk analysts and economists working at financial institutions that invest globally.

Figure A.1.1. Scatter Plot of Institutional Investor Ratings versus Domestic Debt Share in Government Debt, Advanced and Emerging Economies



upper tertile, respectively); *PCGDP* is the end-2004 real purchasing-power-parity per capita GDP and is included as a control.[3]

Results and conclusion

The cross-section regression results lend support to the hypothesis put forward in Table A.1.1: specifically, a 1 percentage point increase in the debt-to-GDP ratio is associated with a 0.38 point decline in the international

[3]This approach mimics that employed by Reinhart and others (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.

Table A.1.1 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)	0.7	0.14	5.12***
DEBT_GDP (in percent)	-0.39	0.07	-5.39***
DEBT_GDP x 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	0.1	-2.54**
DEBT_GDP x 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 percent

Source: IMF staff estimates.

[1]The dependent variable is the institutional investor sovereign rating as of March 2005. Regressors are per capita purchasing-power-parity GDP (in thousands of U.S. dollars), government debt-to-GDP ratio (in percent), and its interaction with *DDINT*, a trichotomous indicator variable that takes a value zero 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 cutoffs are 30 percent and 73 percent for the full sample; and 23 percent 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 is −0.14 for countries in the middle tertile (*DDINT* = 1) and +0.11 for those in the upper tertile (*DDINT* = 2).

[3]The coefficient on *DEBT_GDP* is −0.25 for countries in the lowest domestic debt–share tertile; −0.09 for countries in the middle tertile; and +0.13 for those in the upper tertile.

institutional rating for countries with a "low" domestic debt share, but only by 0.13 point for countries with a "medium" domestic debt share.[4] Results on the emerging market subsample indicate a similar pattern, although the estimated coefficients are slightly smaller.

In conclusion, countries maintaining a larger share of domestic debt 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 (for example, 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).

[4]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.

APPENDIX

2 Illustrative Pension Simulations for 2010–30

This appendix elaborates on the methodology and assumptions behind the illustrative simulations—reported in the main text—that aim, between 2010 and 2030, to stabilize pension expenditure as a percent of GDP in the EU27 countries.

Methodology for computing pension expenditure

The formula below is derived from the fact that total pension spending of a typical Pillar I pension plan 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 age 65, 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 ages 15 and 64 divided by the number of workers, and the old-age dependency ratio (D) is the population over age 65 divided by the population between ages 15 and 64.

Projections for the EU27 countries between 2010 and 2030

Table A.2.1 shows the projected increase in pension spending as a share of GDP in the EU27 countries as a result of expected changes in the right-

Table A.2.1. EU27 Countries: Illustrative Pension Simulations, 2010–30

(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.

hand-side variables of Equation (1), as reported in the 2009 Ageing Report (European Commission, 2009a). Between 2010 and 2030, pension spending increases 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 one parameter under the control of policymakers at a time, the following would be needed:

- A further decrease in the coverage ratio and inverse of employment ratio, which could be obtained by raising the effective retirement age by an

additional 1½ years over time (a calculation based on the assumption that all potential pensioners will work and the benefits ratio will stay constant): Because the average retirement age in EU27 countries already is 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. Because 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.
- An increase in the average contribution rate of 2½ to 3 percentage points: The 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.

Bibliography

Abbas, S. M. Ali, and Jakob E. Christensen, 2010, "The Role of Domestic Debt Markets in Economic Growth: An Empirical Investigation for Emerging Markets and Low-Income Countries," *Staff Papers*, International Monetary Fund, Vol. 57, pp. 209–55.

Alesina, Alberto F., 1988a, "Macroeconomics and Politics," *NBER Macroeconomics Annual*, ed. by Stanley Fischer, Vol. 3, pp. 13–52 (Chicago, Illinois: The University of Chicago Press).

———, 1988b, "The End of Large Public Debts," in *High Public Debt: The Italian Experience*, ed. by Francesco Giavazzi and Luigi Spaventa (Cambridge, Massachusetts: Cambridge University Press).

Alesina, Alberto F., Alessandro Prati, and Guido Tabellini, 1990, "Public Confidence and Debt Management: A Model and a Case Study of Italy," in *Public Debt Management: Theory and History*, ed. by R. Dornbusch and M. Draghi (Cambridge, Massachusetts: Cambridge University Press), pp. 94–118.

Alesina, Alberto F., and Roberto Perotti, 1995, "Fiscal Expansions and Adjustments in OECD Countries," *Economic Policy,* Vol. 21, pp. 207–47.

———, 1996, "Reducing Budget Deficits," *Swedish Economic Policy Review,* Vol. 3, pp. 113–34.

———, 1997, "The Welfare State and Competitiveness," *American Economic Review*, Vol. 87, Issue 5, pp. 921–39.

Alesina, Alberto F., and Silvia Ardagna, 1998, "Tales of Fiscal Adjustments," *Economic Policy,* Vol. 27, pp. 489–545.

———, 2009, "Large Changes in Fiscal Policy: Taxes versus Spending," NBER Working Paper No. 15438 (Cambridge, Massachusetts: National Bureau of Economic Research).

Ardagna, Silvia, 2004, "Fiscal Stabilizations: When Do They Work and Why?" *European Economic Review*, Vol. 48, No. 5, pp. 1047–74.

Baldacci, Emanuele, Benedict Clements, Sanjeev Gupta, and Carlos Mulas-Granados, 2006, "The Phasing of Fiscal Adjustments: What Works in Emerging Market Countries?" *Review of Development Economics*, Vol. 10, No. 4, pp. 612–31.

Bolle, Monica de, Bjoern Rother, and Ivetta Hakobyan, 2006, "The Level and Composition of Public Sector Debt in Emerging Market Crises," IMF Working Paper 06/186 (Washington: International Monetary Fund).

Callen, Tim, Marco Terrones, Xavier Debrun, James Daniel, and Celine Allard, 2003, "Public Debt in Emerging Markets: Is It Too High?" Chapter 3 in *World Economic Outlook* (Washington: International Monetary Fund, September).

Cerra, Valerie, and Sweta Chaman Saxena, 2008, "Growth Dynamics: The Myth of Economic Recovery," *American Economic Review*, Vol. 98, Issue 1, pp. 439–57.

Cordella, Tito, Luca Antonio Ricci, and Marta Ruiz-Arranz, 2005, "Debt Overhang or Debt Irrelevance? Revisiting the Debt-Growth Link," IMF Working Paper 05/223 (Washington: International Monetary Fund).

Cottarelli, Carlo, and Jose Viñals, 2009, "A Strategy for Renormalizing Fiscal and Monetary Policies in Advanced Economies," IMF Staff Position Note 09/22 (Washington: International Monetary Fund).

Cowan, Kevin, Eduardo Levy-Yeyati, Ugo Panizza, and Federico Sturzenegger, 2006, "Sovereign Debt in the Americas: New Data and

Stylized Facts," Inter-American Development Bank Working Paper No. 577 (Washington: Inter-American Development Bank).

Detragiache, Enrica, and Antonio Spilimbergo, 2001, "Crises and Liquidity: Evidence and Interpretation," IMF Working Paper 01/2 (Washington: International Monetary Fund).

Disney, Richard, 2003, "Public Pension Reform in Europe: Policies, Prospects and Evaluation," *The World Economy*, Vol. 26, Issue 10, pp. 1425-45.

Drazen, Allan, 1997, "Towards a Political-Economic Theory of Domestic Debt," NBER Working Paper No. 5890 (Cambridge, Massachusetts: National Bureau of Economic Research).

Eichengreen, Barry, Ricardo Hausmann, and Ugo Panizza, 2005, "The Pain of Original Sin," in *Other People's Money: Debt Denomination and Financial Instability in Emerging Market Economies*, ed. by Barry Eichengreen and Ricardo Hausmann (Chicago: University of Chicago Press).

European Commission, 2006, "European Economy 2006" (Brussels). Available at http://ec.europa.eu/economy_finance/publications/publication825_en.pdf.

———, 2009a, "2009 Ageing Report: Economic and Budgetary Projections for the EU-27 Member States" (Brussels). Available at http://ec.europa.eu/economy_finance/.../publication14992_en.pdf.

2009b, "Sustainability Report 2009" (Brussels). Available at http://ec.europa.eu/economy_finance/publications/publication15998_en.pdf.

Goodhart, Charles A. E., 1999, "Monetary Policy and Debt Management in the United Kingdom," Government Debt Structure and Monetary Conditions, ed. by Chrystal, K. Alec, (London: Bank of England).

———, 2006, "Replacing the Stability and Growth Pact?" Atlantic Economic Journal, Vol. 34, No. 3.

Gupta, Sanjeev, Emanuele Baldacci, Benedict Clements, and Erwin R. Tiongson, 2003, "What Sustains Fiscal Consolidations in Emerging

Market Countries?" IMF Working Paper 03/224 (Washington: International Monetary Fund).

Guscina, Anastasia, and Olivier Jeanne, 2006, "Government Debt in Emerging Market Countries: A New Dataset," IMF Working Paper 06/98 (Washington: International Monetary Fund).

Horton, Mark A., Manmohan S. Kumar, and Paolo Mauro, 2009, "The State of Public Finances: A Cross-Country Fiscal Monitor," IMF Staff Position Note 09/21 (Washington: International Monetary Fund).

International Monetary Fund 2009a, "Crisis-Related Measures in the Financial System and Sovereign Balance Sheet Risks" (Washington, July). Available at www.imf.org/external/pp/longres.aspx?id=4361.

———, 2009b, "Fiscal Rules—Anchoring Expectations for Sustainable Public Finances" (Washington, November). Available at www.imf.org/external/pp/longres.aspx?id=4402.

———, 2009c, "Fiscal Implications of the Global Economic and Financial Crisis," IMF Occasional Paper No. 269 (Washington, September). Available at www.imf.org/external/pubs/cat/longres.cfm?sk=22848.0.

———, 2009d, "The Implications of the Global Financial Crisis for Low-Income Countries—An Update" (Washington, March). Available at www.imf.org/external/pubs/cat/longres.cfm?sk=22712.0.

———, 2009e, "The State of Public Finances Cross-Country Fiscal Monitor: November 2009," IMF Staff Position Note 09/25 (Washington, November). Available at www.imf.org/external/pubs/cat/longres.cfm?sk=23340.0.

Kroszner, Randall S., 1999, "Is It Better To Forgive than To Receive? Repudiation of the Gold Indexation Clause in Long-Term Debt during the Great Depression," Working Paper 481 (Chicago: Graduate School of Business, Center for Research in Security Prices, University of Chicago). Available at http://faculty.chicagogsb.edu/finance/papers/repudiation11.pdf.

McDermott, C. John, and Robert F. Westcott, 1996, "An Empirical Analysis of Fiscal Adjustments," *Staff Papers*, International Monetary Fund, Vol. 43 (December), pp. 725–53.

Organization for Economic Cooperation and Development, 2005, "OECD Guidelines on Corporate Governance of State-Owned Enterprises," (Paris). Available at www.oecd.org/daf/corporateaffairs/soe/guidelines.

———, 2007, "What Promotes Fiscal Consolidation: OECD Country Experiences," Economics Department Working Paper No. 553 (Paris).

Pattillo, Catherine A., Hélène Poirson, and Luca A. Ricci, 2002, "External Debt and Growth," IMF Working Paper 02/69 (Washington: International Monetary Fund).

———, 2004, "What Are the Channels Through Which External Debt Affects Growth?" IMF Working Paper 04/15 (Washington: International Monetary Fund).

Perotti, Roberto, 2002, "Estimating the Effects of Fiscal Policy in OECD Countries," European Central Bank Working Paper No. 168 (Paris).

Reinhart, Carmen M., Kenneth S. Rogoff, and Miguel A. Savastano, 2003, "Debt Intolerance," NBER Working Paper No. 9908 (Cambridge, Massachusetts: National Bureau of Economic Research).

Saint-Paul, Gilles, 1992, "Fiscal Policy in an Endogenous Growth Model," *Quarterly Journal of Economics*, Vol. 107, pp. 1243–59.

Tsibouris, George, Mark A. Horton, Mark J. Flanagan, and Wojciech S. Maliszewski, 2006, "Experience with Large Fiscal Adjustments," IMF Occasional Paper No. 246 (Washington: International Monetary Fund).

Von Hagen, Jürgen, Andrew H. Hallett, and Rolf Strauch, 2001, "Budgetary Consolidation in the EMU," *Economic Papers,* No. 148 (Brussels: Commission of the European Communities).

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