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### Long-term fiscal sustainability in OECD countries

*Comment on Alan Auerbach*

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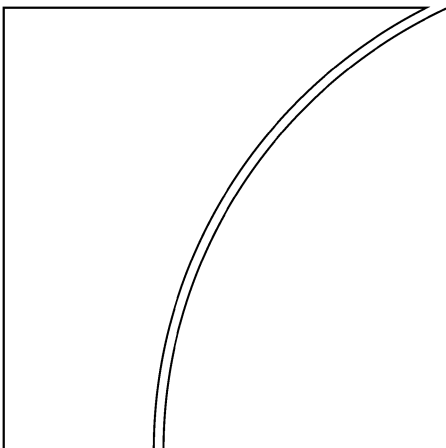
## BIS Working Papers No 361

# Long-term fiscal sustainability in major economies

by Alan J Auerbach, Discussion Comments by Pier Carlo Padoan,  
Paul van den Noord and Ray Barrell

Monetary and Economic Department

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## Foreword

On 23–24 June 2011, the BIS held its Tenth Annual Conference, on “Fiscal policy and its implications for monetary and financial stability” in Lucerne, Switzerland. The event brought together senior representatives of central banks and academic institutions who exchanged views on this topic. The papers presented at the conference and the discussants’ comments are released as BIS Working Papers 361 to 365. A forthcoming BIS Paper will contain the opening address of Stephen Cecchetti (Economic Adviser, BIS), a keynote address from Martin Feldstein, and the contributions of the policy panel on “Fiscal policy sustainability and implications for monetary and financial stability”. The participants in the policy panel discussion, chaired by Jaime Caruana (General Manager, BIS), were José De Gregorio (Bank of Chile), Peter Diamond (Massachusetts Institute of Technology) and Peter Praet (European Central Bank).



## Table of contents

Foreword .....	iii
Conference programme .....	vii
<b>Long-term fiscal sustainability in major economies</b> (by Alan J Auerbach)	
1. Introduction.....	1
2. Case Study: the U.S. Fiscal Future.....	2
3. Fiscal Imbalances around the World.....	6
4. Explaining CDS Spreads and Interest Rate Differentials.....	9
5. Further Risks from Cross-Border Exposure and Contagion .....	10
6. Can Fiscal Rules Help? .....	10
7. The Path Forward.....	12
References .....	14
<b>Discussant comments by Pier Carlo Padoan and Paul van den Noord .....</b>	<b>23</b>
<b>Discussant comments by Ray Barrell .....</b>	<b>34</b>



## Programme

### Thursday 23 June 2011

- 12:15–13:30** Informal buffet luncheon
- 13:45–14:00** Opening remarks by Stephen Cecchetti (BIS)
- 14:00–15:30** **Session 1: The risks and challenges of long-term fiscal sustainability**
- Chair: Øystein Olsen (Central Bank of Norway)
- Author: Alan Auerbach (University of California, Berkeley)  
“Long-term fiscal sustainability in major economies”
- Discussants: Pier Carlo Padoan (OECD)  
Ray Barrell (NIESR)
- Coffee break (30 min)**
- 16:00–17:30** **Session 2: The effects of fiscal consolidation**
- Chair: Stefan Ingves (Sveriges Riksbank)
- Author: Roberto Perotti (Università Bocconi)  
“The ‘austerity myth’: gain without pain?”
- Discussants: Carlo Cottarelli (IMF)  
Harald Uhlig (University of Chicago)
- 19:00** **Dinner**
- Keynote lecture: Martin Feldstein (Harvard University/NBER)

### Friday 24 June 2011

- 8:00–9:30** **Session 3: Fiscal policy and financial stability**
- Chair: Patrick Honohan (The Central Bank of Ireland)
- Author: Carmen Reinhart (Peterson Institute for International Economics)  
“The liquidation of government debt”
- Discussants: Ignazio Visco (Bank of Italy)  
Alan Taylor (University of California – Morgan Stanley)
- Coffee break (30 min)**
- 10:00–11:30** **Session 4: Fiscal policy and inflation**
- Chair: Prasarn Trairatvorakul (Bank of Thailand)
- Author: Eric Leeper (Indiana University)  
“Perceptions and misperceptions of fiscal Inflation”
- Discussant: Christopher Sims (Princeton University)  
Michael Bordo (Rutgers University)
- Coffee break (15 min)**



**Friday 24 June 2011 (cont)**

**11:45–13:15**

**Session 5:**

**Fiscal policy challenges in EMEs**

Chair:

Axel Weber (The University of Chicago Booth School of Business)

Author:

Andrés Velasco (Harvard Kennedy School)  
“Was this time different ? Fiscal policy in commodity republics”

Discussants:

Choongsoo Kim (Bank of Korea)  
Guillermo Calvo (Columbia University)

**13:15**

**Lunch**

**15:00–16:30**

**Panel discussion**

**“Fiscal policy sustainability and implications for monetary and financial stability”**

Chair:

Jaime Caruana (BIS)

Panellists:

José De Gregorio (Central Bank of Chile)  
Peter Diamond (Massachusetts Institute of Technology)  
Peter Praet (European Central Bank)

# Long-term fiscal sustainability in major economies

Alan J Auerbach<sup>1</sup>

## 1. Introduction

As the world economy slowly recovers from the very deep and widespread recession of recent years, many countries confront very serious fiscal imbalances. How much time they have to deal with these imbalances is a central question, the salience of which can only have been increased by the ongoing fiscal crisis and bailout in Greece and the immediate fiscal adjustments being discussed or already undertaken in several other countries.

There is little doubt that much of the current attention to fiscal imbalances is attributable to the rapid increases in debt to GDP ratios arising from the recession, either directly through the automatic tax and spending responses to slow growth, or indirectly through the countercyclical discretionary fiscal measures undertaken. Table 1 shows the evolution of net general government debt to GDP ratios for several leading economies in recent years, starting in 2007, just as the worldwide recession began.

For many countries, debt to GDP ratios have increased and are projected to continue increasing sharply under current economic and policy trajectories. While the increases are large for countries that have been generally discussed as confronting fiscal crises, in particular Greece, Ireland, Portugal and Spain, they are substantial as well for all of the G-7 countries except for Germany, with Japan, the United Kingdom and the United States all being projected to roughly double their debt to GDP ratios over this short period, a very large change in peacetime. Indeed, the U.K. government has already implemented a serious austerity program aimed at altering its trajectory, and there has been an increased intensity of discussion, if not yet action, in the United States.

These short-term trajectories clearly are attention-getting. For some countries, such as Greece, there is little need to look beyond them to know that a large and immediate fiscal adjustment is needed. But debt to GDP ratios alone typically do not tell us how long countries have before they must make fiscal adjustments or how large these adjustments need to be. Some countries, for example Italy and Japan, have maintained high debt to GDP ratios for some time. Also, for countries not necessarily facing any short-run crisis, these projections may provide an inadequate picture of underlying fiscal imbalances. This is because the factors contributing to short-term debt accumulation differ substantially from those that will affect debt accumulation over the longer term, after the next few years, factors that have little to do with the business cycle and the rate of economic recovery, and much more to do with demographic change and the associated changes in government spending and tax collections.

Thus, policy measures that attack long-term imbalances, such as reforms of unfunded public pensions or gradual modifications of systems of public health care provision, may have little impact on short-term fiscal measures, and measures that attack the rate of debt

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<sup>1</sup> University of California, Berkeley.

This paper was prepared for the tenth BIS Annual Conference, Fiscal Policy and its Implications for Monetary and Financial Stability, June 23-24, 2011, Lucerne, Switzerland. I am grateful to John Mondragon for research assistance and to my discussants, Pier Carlo Padoan and Ray Barrell, and other conference participants for comments on an earlier draft.

accumulation over the next several years may have little impact on longer-term fiscal imbalances.

It is difficult to know when any particular country might encounter a fiscal crisis, given short-term and long-term fiscal projections for them and anticipated policy responses. Fiscal projections aside, a country's political environment and fiscal institutions matter, too, for they provide a reading of the ease or difficulty with which needed adjustments can occur. Most of the discussion in this paper will be about the measurement of fiscal imbalances and the size of necessary adjustments, rather than about the strength of fiscal institutions in different countries. We will, however, comment on a variety of approaches that have been attempted and are currently being discussed for facilitating necessary fiscal adjustments.

Although this paper is about the fiscal situations and prospects for developed economies around the world, we begin with a more detailed case study of the United States, a convenient choice because of the importance of the U.S. economy and because of the availability of detailed projections. While circumstances differ from country to country, the tools of analysis will be similar, and many of the issues that will arise in the analysis of the U.S. situation will carry over to most other leading economies, given the underlying similarities of their fiscal systems and demographic trends.

## **2. Case Study: the U.S. Fiscal Future**

For the United States, standard budget projections are available from the Congressional Budget Office (CBO) over a ten-year budget window beginning in the current fiscal year. The CBO projections are heavily cited and relied upon, but in interpreting them one immediately confronts a key issue relating generally to budget projections. While these projections naturally depend on economic forecasts, they also depend on one's interpretation of "current" policy. By convention, CBO interprets current policy as current law, even if current law calls for large policy changes through the expiration or introduction of tax or spending provisions, and even if these legislated changes are not likely to occur, given the likely political environment.

Figure 1, taken from Auerbach and Gale (2011), shows three potential trajectories for the U.S. debt to GDP ratio over the next decade based on the most recent CBO forecasts: the CBO forecast itself, this forecast adjusted to conform to policy as laid out by the Obama administration, and the CBO forecast adjusted by the assumption that current provisions, rather than current law, is maintained, ie in particular that tax cuts from the Bush period in the previous decade will not expire as scheduled.<sup>2</sup>

All of the measures show deficits shrinking sharply relative to GDP through the recovery, but CBO's baseline shows a steeper drop through 2015 and a slower increase in the deficit as a share of GDP after 2015, while the extended policy and administration policy scenarios show more rapid increases in the deficit as a share of GDP over the last six years of the projection, ending the period at 6.5 percent and 4.9 percent of GDP, respectively.

These differences in time paths for the deficit turn into substantial differences in terminal values for the debt to GDP ratio, as shown in Figure 2. Under the CBO baseline, the debt rises to 75.6 percent by 2021, rising rapidly at first to about 75.1 percent of GDP in 2013 and

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<sup>2</sup> All of these projections are for the U.S. federal government only, in contrast to those in Table 1, which include all levels of government. Including states would make the picture worse for the United States, in particular over the longer term when large unfunded pension commitments loom (Novy-Marx and Rauh, 2011). However, there are no available projections for the states that are based on the same economic assumptions as those used in constructing the CBO projections used here.

then flattening out over the decade. In contrast, under the extended policy scenario, the debt to GDP ratio rises steadily, and exceeds 97 percent by 2021. The administration budget shows debt to GDP reaching 87.4 percent in 2021. This very large range of possible outcomes under three interpretations of “current policy” after just ten years would be compounded by uncertainty regarding relevant economic variables, in particular the rate of interest and the rate of economic growth.

As a frame of reference for these debt to GDP ratios, note that the highest value in history – 109 percent – occurred in 1946, after a massive debt accumulation during World War II. In 1946, peacetime and a large drop in government spending loomed, quite unlike the situation that is likely to prevail in 2021. Thus, under the most pessimistic of these three scenarios (from the point of view of fiscal adjustment), the United States will be on the verge of passing its highest debt to GDP ratio within a very short period, not a trajectory that is likely to be sustainable if that point is reached.

Thus, over the very short term, the U.S. deficit will decline, and the growth of its debt to GDP ratio will slow. But by the end of the decade, deficits are likely to begin growing as a share of GDP and the debt to GDP ratio will approach levels that, for the United States, are unprecedented. The reason for this projected growth in the deficit as a share of GDP is the demographic factors that will become much more important in the next decade and thereafter. As of 2021, according to CBO projections, the three key entitlement programs – Medicare (old-age medical care), Medicaid (medical care for the poor, a large fraction of which also goes to the elderly to pay for long-term care), and Social Security (old age and disability pensions) – will account for nearly 12 percent of GDP and 57 percent of all non-interest federal spending, compared to 10 percent of GDP and 44 percent of non-interest spending this fiscal year. In the coming decades, all projections are for this share of GDP to continue growing, although the rate of growth is subject to considerable uncertainty, even relative to other long-range projections.

The key source of this uncertainty has to do not with demographic change itself but with the evolution of health care spending. As of 2060, for example, the most optimistic public forecast for Medicare spending (from the official forecast of the Medicare Trustees, 2011) puts that spending at 6.1 percent of GDP (compared to 3.7 percent now), to a large extent reflecting the assumption that the 2010 U.S. health care reform will reduce costs as called for in the legislation. On the other hand, CBO’s most recent (CBO, 2011) forecast is for Medicare spending to hit 9.9 percent of GDP in 2060. Even under the most optimistic assumptions regarding Medicare, however, projected federal spending on Medicare, Medicaid and Social Security will approach 17 percent of GDP in 2060, absorbing over 6 percent of GDP more than today. This is a very large increase, given that federal revenues over the past several decades have been relatively stable at around 18-19 percent of GDP.

One method of measuring a country’s fiscal imbalance that takes longer-term commitments into account is the *fiscal gap* associated with them, typically expressed as a share of GDP. As defined, for example, in Auerbach (1994, 1997), a fiscal gap over a horizon from the current period,  $t$ , through a terminal period,  $T$ , would equal the required increase in the primary surplus relative to those projected under current policy that would be needed to maintain the debt to GDP ratio at its current value, or

$$\Delta = \frac{B_{t-1} - (1+r)^{-(T-t)} B_{t-1} \frac{Y_{T+1}}{Y_t} + \sum_{s=t}^T (1+r)^{-(s-t+1)} D_s}{\sum_{s=t}^T (1+r)^{-(s-t+1)} Y_s} \quad (1)$$

where  $B_{t-1}$  is the outstanding debt at the end of year  $t-1$  (the beginning of year  $t$ ),  $D_t$  is the primary deficit in year  $t$ ,  $Y_t$  is GDP in year  $t$ , and  $r$  is the relevant interest rate. Based on a

range of recent economic and fiscal projections and interpretations of what “current policy” is, Auerbach and Gale (2011) estimate a federal-government fiscal gap for the United States at between 4 and 10 percent of GDP over the infinite horizon (ie for  $T \rightarrow \infty$ ), and between 3 and 6 percent through 2060.<sup>3</sup> The estimates are bleaker over the longer horizon because spending on the key programs already discussed is projected to continue growing as a share of GDP after 2060. Thus, extending the horizon adds to the fiscal gap calculation years with progressively larger projected primary deficits relative to GDP, increasing the required average annual adjustment.

One key assumption incorporated in these fiscal gap calculations is that the interest rate on government debt and the rate of economic growth follow a trajectory consistent with recent experience. In particular, the calculations incorporate the long-term forecasts for the yield on government bonds and the growth rate of the economy made by the Trustees of the Social Security System (2011) in its own calculations of fiscal sustainability. The difference between these two rates – a key number in the dynamics of debt accumulation – is just over 1 percentage point over the long term. This means that the primary surplus needed in any given year, as a share of GDP, to prevent the debt to GDP ratio from growing equals about 1 percent of the net debt to GDP ratio, or less than 1 percent of GDP in the present circumstances for the United States.

If, however, debt accumulation contributes to slower economic growth and also to scepticism about a country’s ability to service its debt, the gap between interest and growth rates might rise rapidly and in turn make a sustainable fiscal path much harder to achieve. As already mentioned, the U.S. debt to GDP ratio will pass its postwar high in just over ten years under one characterization of current policy, even with very favourable assumptions about growth and interest rates, so an alternative trajectory of even faster debt accumulation is certainly possible if no credible action is taken over this period to address the U.S. fiscal imbalance. This would make some sort of fiscal crisis more likely in the short run, although it is of course very difficult to predict the timing.

In summary, the United States faces a deficit trajectory over the next decade that should improve as economic recovery continues. As a consequence of several years of large deficits, however, the debt to GDP ratio is likely by the end of the decade to approach historically unprecedented levels, suggesting the need for significant fiscal adjustment by that time. Moreover, the picture in the following decades is still bleaker because of the growth in pension and health care costs associated with population aging and trends in health care spending. While this growth is a “future” problem in terms of when the spending will actually occur, it is a current problem not only in terms of the need for government adjustment planning, but also from a market perspective to the extent that financial markets recognize these implicit liabilities as making U.S. fiscal policy less sustainable.

One question regarding these projections is what they imply about the possible adjustment process. A key issue involves when fiscal consolidation should begin, in light of the relatively weak economic recovery that is occurring. Views and policies differ at present. For example, while the United Kingdom has embarked on a policy of large, immediate spending cuts, the United States’ most recent major action, at the end of 2010, was an extension and expansion of tax cuts.

There have been many contributions to the literature over recent decades arguing that fiscal consolidations might be expansionary if undertaken by countries facing high debt levels and fiscal imbalances (eg Perotti, 1999), particularly if these adjustments take the form of

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<sup>3</sup> These estimates start with one of the three ten-year scenarios already discussed and incorporate available longer-term projections for the expenses and dedicated taxes for Medicare, Medicaid and Social Security, assuming that other components of the primary surplus remain constant at 2021 shares of GDP.

reductions in government spending rather than tax increases (eg Ardagna, 2004). Even so, the exact timing that consolidations should follow is unclear, and the issue of how to deal with looming entitlement programs is not really informed by the existing literature, which has concentrated on adjustments to current taxes and spending, that is, changes in explicit liabilities rather than implicit ones.

For example, what would be the economic effects of a policy that puts in place gradual reductions in public pensions and health care spending but that has little impact on short-run deficits or accumulation of explicit debt? Regardless of other consolidation measures taken in the short run, such adjustments will ultimately be much more significant in achieving fiscal sustainability in the longer run. Therefore, following the logic that describes when fiscal contractions might be expansionary, they should have such an impact if they are credible. But if changes are scheduled to take place gradually over time, how credible will they be today, and what elements of reform can contribute to this credibility? Is it necessary to establish credibility, as seems to be the argument currently by some in the United States, to combine these reforms with other, immediate spending reductions, even if such immediate reductions contribute little to the attainment of long-run balance?

Finally, just as the coming fiscal consolidations will have a different focus than past consolidations, the tools of adjustment will differ. In particular, and of special importance concerning the potential interactions of monetary and fiscal policies, the role of potential inflation is much less significant now than in the past. This is because it is not the existing stock of nominal debt that makes the U.S. fiscal gap so large, but rather the projected growth of entitlement spending programs described above. All of these programs represent real commitments, not nominal ones, either through direct indexing, as in the case of old age pensions, or through commitments to provide real goods and services, as in health care programs. These implicit liabilities swamp the existing stock of nominal debt.

For example, the current unfunded liability of the U.S. social security system is \$17.9 trillion (Social Security Trustees, 2011, p. 14), which is nearly double the publicly held stock of national debt, which itself includes some debt that is indexed and other debt that is short-term and hence not very susceptible to erosion through rapid price increases. Further, this implicit liability for social security pales in comparison to what one would calculate for the Medicare and Medicaid programs using a similar methodology, given the more rapid projected growth in these programs. Even under the most favourable estimates cited above in relation to the U.S. fiscal gap, Medicare's unfunded liability is nearly \$40 trillion.<sup>4</sup> It would be considerably higher under other projections.

Thus, regardless of whether inflation is seen as an attractive policy option to deal with fiscal imbalances, and whether or not the looming imbalances might lead to inflation (either through induced monetary policy responses or some other mechanism) if they are not addressed through significant changes in tax or spending policies, inflation can in the end play only a very minor role in addressing the long-run fiscal imbalance. This is a very firm conclusion for the United States, but it is clearly relevant for other countries as well, given their spending patterns and demographic characteristics.

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<sup>4</sup> According to the 2011 Medicare Trustees Report, over the infinite horizon general revenue contributions – funding from sources over and above the programs' dedicated revenues – of \$22.4 trillion will be needed to cover expenses for Medicare Part B (supplementary medical insurance; see Table III.C15) and another \$16.1 trillion will be needed to cover Medicare Part D (prescription drug insurance; see Table III.C23). According to these same projections, the remaining component of Medicare, Part A (hospital insurance; see Table III.B11) will be roughly in balance over the infinite horizon due to the declines in the growth rate of health care spending attributed to enforcement of the reductions in reimbursement rates as called for by the 2010 health care legislation.

### 3. Fiscal Imbalances around the World

Having laid out many of the issues relevant to evaluating fiscal prospects, let us consider estimates for a wide range of countries. Figure 3 presents estimates of fiscal gaps for the same twenty countries appearing in Table 1, based on recent data and IMF projections. Like the figures in Table 1, these are for general government at all levels. To form these estimates, we start with actual 2010 levels of net publicly held debt and GDP, and then add projections for primary surpluses as a share of GDP through 2016 from IMF (2011). For years after 2016, it is necessary to make some assumptions as to the further evolution of primary surpluses, and we take an approach similar to that used above for the U.S. calculations, separating “normal” components from those related to aging and health.

For shares of GDP accounted for by revenues and non-interest spending in areas excluding health care and public pensions, we set values equal to the average of these shares over the period 2002-2007, an assumption intended to provide over the longer run a stable estimate of recent, pre-crisis revenue and spending fundamentals. For the remaining components, we incorporate recent projections from the IMF (2010a, b). For our initial calculations, we assume a real discount rate of 3 percent and a real GDP growth rate of 2 percent. (From the nature of these calculations, the levels of the real interest and growth rates matter little, with the gap between them being the key factor.) Given the absence of very long-run projections such as those that exist for the United States, we limit our fiscal gap estimates to a 50-year horizon.<sup>5</sup>

Figure 3 displays the resulting fiscal gap estimates, with the first bar for each country representing the baseline estimates. The U.S. estimate is just above the top of the range for those cited above, reflecting both relatively pessimistic projections for health care and the inclusion of sub-national levels of government in the calculations. Indeed, fiscal gaps for the United States are among the highest in the figure, likely because health care spending is so much larger a share of GDP than in most other countries.<sup>6</sup> But two other members of the G-7, Japan and the United Kingdom, also have fiscal gaps around 8 percent of GDP. Given recent events, it is perhaps not very surprising that the fiscal gap in Greece is an outlier among the estimates. But for the other “at risk” countries, Ireland, Portugal and Spain, the results are less consistent. The projected gap for Portugal is indeed quite high, but those for Ireland and Spain, while by no means insignificant, do not stand out among the other developed economies displayed in the figure.

An explanation for this apparently weak relationship between current debt and fiscal conditions and estimates of the long-run fiscal gap comes from inspection of expression (1). If one assumes that achievement of a sustainable path means that a country must maintain a constant debt to GDP ratio, then a portion of debt service is provided by debt growth, since debt is allowed to grow at the same rate as GDP. Thus, the added fiscal burden of debt service is determined by the difference between the interest rate and the growth rate, and will not be especially high unless one assumes a large gap between the two rates, an issue to which we return shortly. Another way of demonstrating this point is by considering how much of the fiscal gap is due to debt service, and how much is due to future primary surpluses. The second bar for each country in Figure 3 displays fiscal gaps under the assumption of no

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<sup>5</sup> Because the IMF projections are available only through 2050, we assume smooth growth of all components with GDP thereafter.

Further details regarding these calculations are available upon request.

<sup>6</sup> It is true that public share of health care spending is lower in the United States than elsewhere, but as the public component in the United States is heavily concentrated among the elderly, this component will grow faster over time as the population ages.

initial debt, showing that future primary surpluses, rather than initial debt, are typically much more important as a determinant of the fiscal gaps.

Of course, an alternative view might be that maintaining current debt to GDP ratios is not an adequate objective for fiscal sustainability, for countries that have very high debt to GDP ratios may not be able to maintain them. It is hard to know what objective to use in place of this, although the IMF (2010a) has considered fiscal adjustments needed for countries to achieve net debt to GDP ratios of .45, which for many countries would require additional fiscal resources to achieve. The third bar for each country in Figure 3 shows fiscal gaps for this alternative assumption regarding terminal debt to GDP ratios. For most countries, this does indeed add to the measured fiscal gaps, but again the quantitative impact is relatively small, in this instance because the period of adjustment is assumed to be so long.

The last set of calculations in Figure 3 illustrates how important are the implicit liabilities that are associated with health care spending and pension growth. The fourth bar for each country shows what the fiscal gap would be if there were no increase relative to GDP in spending on health care or pensions after 2016. For all countries, this assumption reduces the estimated fiscal gaps, and for many (Australia, Belgium, Canada, Denmark, Finland, and New Zealand) it eliminates the gap entirely. That is, for these countries, more than 100 percent of the estimated fiscal gap can be attributed to growth in these expenditures. For most other countries, this adjustment eliminates more than half of the initially estimated fiscal gap, meaning that these factors account for a larger share of the fiscal gap than the need to service initial liabilities, the importance of which we have already considered, or other sources of ongoing primary imbalances.

While it is unrealistic to imagine that spending on pensions and health care spending could remain constant as a share of GDP as populations grow older and health care technology continues to evolve, not all projections of future expenditures are as pessimistic as those of the IMF. For example, recent projections of long-term spending growth by the European Commission (2009) show slower growth in health care spending, with the result that estimated fiscal gaps are smaller. If we incorporate these alternative projections using a similar methodology to that used for the IMF projections, we obtain the results shown in Figure 4, for the two main variants of the EC projections.<sup>7</sup>

Even under the most optimistic assumptions, however, several European countries must face substantial adjustments, with all countries except Denmark, Finland, Norway and Sweden facing gaps of 2 percent of GDP or more, all but Greece in the range of 2-5 percent of GDP. While these gaps are lower than those based on the IMF projections, they are certainly not small. Thus, like Cecchetti et. al. (2010), we conclude that the need for fiscal adjustment is widespread and significant.

It is important to emphasize once again that, regardless of the long-term projections on which they are based, current debt to GDP ratios don't provide a full picture of a country's fiscal situation. A simple regression of the baseline fiscal gaps in Figure 3 on 2010 net debt to GDP ratios does yield an impressive adjusted  $R^2$  of .63, but this drops to .26 once the two outliers, Norway and Greece, are excluded from the estimation.

Figure 5 presents a scatter plot of fiscal gaps versus debt to GDP ratios for this subsample of countries, showing the fitted regression line and with countries having the largest residuals labelled. According to this simple relationship, Italy and Sweden have better long-run prospects than their debt to GDP ratios alone indicate, and the Netherlands, Portugal, the United Kingdom and the United States have worse prospects. Including the most recent

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<sup>7</sup> The only differences in methodology are (1) the EC estimates also project education spending over the long term, and we include these as well as pension and health care spending projections; and (2) the EC estimates go through 2060, so no extrapolation is needed.



deficit-GDP ratio as a second explanatory variable adds little power to this regression, with a t-statistic of 0.5 and a fall in the adjusted  $R^2$ . This last result makes sense, as current deficits to some extent reflect cyclical conditions that do not play an important role in long-run projections, and on the other hand do not incorporate the impact on future spending of aging and health care trends, which the fiscal gap calculations are designed to capture. As shown in Figure 3, the projected growth of spending in these areas accounts for all or most of the fiscal gaps in most countries.

As discussed above, the ability of a country to sustain a given path of revenues and spending depends on the degree to which markets expect it to be able to do so. That is, if interest rates rise because of perceived risk of default, then this will increase debt service costs and make it more difficult for the country to avoid default. We have ignored this issue thus far in calculating fiscal gaps, essentially assuming that debt accumulation and the expectation of future primary deficits does not affect the interest rate or the rate of economic growth. In particular for countries already considered as being at risk, this assumption might greatly understate the difficulty of achieving sustainability.

To assess the importance of this issue, we calculate fiscal gaps using estimates of actual real interest and growth rates, rather than the assumed rates of 3 percent and 2 percent used thus far. In particular, for each country, we use the real growth rate projected by the IMF for 2016; to approximate the real interest rate, we subtract from the current 10-year benchmark government bond yield the projected inflation rate for 2016. For all four “at risk” European countries – Greece, Ireland, Portugal, and Spain – this change in assumptions increases the gap between the real interest and growth rates above the 1 percentage point assumed thus far. As shown in Figure 6, these alternative assumptions do indeed raise the estimated fiscal gaps for all four countries, with the smallest impact being on Spain, for which the gap rises by just over 0.1 percentage points, and the largest impact being on Greece, for which the increase is nearly 4 percentage points. The leading factors behind these large differences in impact are the real interest rates and initial debt to GDP ratios for the respective countries. Greece is already facing a higher borrowing rate than the other countries, and also has a much higher initial debt that must be serviced, relative to GDP.<sup>8</sup>

In summary, most leading economies face sizable fiscal gaps, even when optimistic assumptions are made regarding the growth of pension and health care spending, and even if one ignores the possible negative impact that debt accumulation and an unstable fiscal trajectory can have on the cost of servicing a country’s growing liabilities. Some countries for which the need for fiscal adjustment is not simply a future consideration already face a more challenging task because of higher borrowing rates. One element affecting the speed with which a fiscal crisis might occur is the sensitivity of borrowing rates to a country’s fiscal position, an issue to which we now turn.

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<sup>8</sup> It is actually possible for the fiscal gaps to decline with an increase in the real interest rate, if the initial debt to GDP ratio is not too high and if, as is the case here, projected primary deficits grow over time as a share of GDP.

A higher interest rate increases the cost of debt service, but it also provides a higher rate of return on the funds that must be accumulated over the medium term to provide for large future primary deficits. Thus, if most of the fiscal gap comes from future primary deficits, the second effect can outweigh the first. This is not only a theoretical possibility; Auerbach and Gale (2009) estimated that, as of 2009, a prolonged period of very low government borrowing rates would actually have increased the U.S. fiscal gap slightly, when calculated over the infinite horizon.

Even if a higher interest rate did result in a lower fiscal gap, however, this conclusion is based on the inherent assumption of immediate fiscal adjustment. With a delay before adjustment begins, more debt would accumulate and make the extra burden of servicing the existing debt a more important component of the fiscal gap.

#### 4. Explaining CDS Spreads and Interest Rate Differentials

What determines a country's borrowing rate? Tables 2 and 3 present a preliminary exploration. In Table 2, the dependent variable is the credit default swap (CDS) spread on sovereign debt, averaged over the third quarter of 2010, which as a measure of default risk should be reflected in yields. The initial sample includes all countries considered above except Canada, for which we do not have data from our source (Datastream).

The first three columns of Table 2 include one explanatory variable each, respectively the baseline fiscal gap as calculated above, the budget surplus relative to GDP, and the net debt relative to GDP. Each of these variables' coefficients has the predicted sign, with all three relationships being significant or nearly so. Including all explanatory variables at the same time, in column (4), leaves only the fiscal gap as marginally significant, suggesting that forward-looking considerations may be important.

One factor that many have suggested may affect a country's ability to maintain a high debt to GDP ratio is the share of its debt held domestically. For example, Japan's debt to GDP ratios have historically been high relative to other countries and yet this has been seen as a more limited problem because such a large share of Japan's national debt is held internally. As Figure 7 shows, shares of gross debt held externally among the countries examined here vary enormously, with virtually all of Japan's debt held internally and virtually all of Finland's held abroad. Does this variation influence default risk? Column (5) repeats the regression in the previous column, but in this case all fiscal variables are interacted with the fraction of debt held externally.<sup>9</sup> Indeed, the equation's explanatory power, as measured by the adjusted  $R^2$ , increases substantially, and the coefficients of all three fiscal variables increase in significance, with the fiscal gap still having the strongest impact.

Given the small sample size with which we are working, however, this result as well as others should be viewed only as suggestive. For example, excluding the two outliers identified earlier, Norway and Greece, leads to the results in the last two columns of the table, in which the impact of the fiscal gap is substantially reduced and the budget surplus becomes more significant in its impact.

Table 3 repeats the same regressions, but with the dependent variable equal to the benchmark 10-year yield relative to Germany. Because there are many other factors that can explain yield differentials, notably exchange rate risk and expected movements in exchange rates, we limit our consideration to those countries (other than Germany) in our sample that are also members of the Euro area.

Even in this small sample, and even when Greece is excluded (columns (6) and (7)), the budget surplus exerts a strong force on the yield spread; the other coefficients have the predicted sign but are insignificant, which is not entirely surprising given the small sample size. Given the units in which the variables are measured (with the budget surplus being expressed as a percent of GDP), an increase of 1 percent of GDP in the budget surplus is estimated to reduce a country's borrowing cost by 17 basis points, or by 30 basis points times the share of debt held externally, which, at the sample average value of external debt, translates into 16 basis points per 1 percent of GDP increase in the budget surplus. Thus, the convergence of interest rates that prevailed in the Euro area prior to the fiscal crisis seems no longer present; the circumstances in individual countries now do matter.

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<sup>9</sup> The results in this column and column (7) are for a sample that omits New Zealand, for which we lack data on external debt holdings comparable to those used for the other countries.

## 5. Further Risks from Cross-Border Exposure and Contagion

Leading up to the Greek bailout and since then, much of the support for intervention was based on the potential exposure of financial institutions in other Euro area countries, which led to concerns that a serious disruption in Greece could lead to disruptions elsewhere.

There is little doubt that cross-border exposure is a relevant consideration. How one should measure this exposure is not obvious. As a start, one might wish to look at all of a country's liabilities, both public and private, that financial institutions hold because of the very real possibility that private distress will lead to public bailouts within the country – thus making private obligations public – and also because a severe financial crisis arising from a sovereign default would also have major repercussions for the country's private borrowers.

Figure 8 shows the exposure at the end of 2010 of financial institutions in a subset of the countries analyzed above to the liabilities (public plus private) in the four key “at risk” countries, Greece, Ireland, Portugal and Spain. The holdings are expressed as a share of GDP in the creditor countries. The figure reveals that several countries in Europe have important exposure to at least one of the countries in financial distress, with geographic proximity playing some role. For example, institutions in Portugal have considerable exposure to Spain and those in Spain have considerable exposure to Portugal, while on the other hand U.S. institutions have relatively little exposure to any of the problem countries.

Note that, although exposure to Greece was one justification offered for the Greek bailout, this exposure is generally far less significant than exposure to the other three countries, particularly Ireland and, especially, Spain. Finally, the exposure of institutions in the problem countries themselves is considerable, particularly in Ireland and Portugal; Portugal's exposure to Spain equals nearly 12 percent of Portuguese GDP, and Ireland's exposure to Spain equals 7 percent of Irish GDP.

One possible explanation for this large cross-border exposure to countries at risk might be a perception that these countries' sovereign liabilities are effectively convertible into more stable sovereign issues with the Euro area, an explanation that is consistent with the low yield spreads that prevailed prior to the crisis. But yield spreads have diverged, and any perceptions of convertibility have likely changed as well, in spite of the Greek bailout. Some indication of responses to this change in regime comes from Figure 9, which displays the change in cross-border exposure during the last quarter of 2010. The figure shows a general pattern of reductions in exposure, with the changes in Ireland being particularly striking. Thus, while in the short run contagion may remain a serious concern, the change in regime that has been occurring may lessen this concern as time passes.<sup>10</sup>

## 6. Can Fiscal Rules Help?

Given the large fiscal adjustments that most leading economies must undertake, an important question is whether some sort of fiscal rules or institutions can help. The experience in the Euro area to date under the Stability and Growth Pact (SGP) is not especially encouraging. In the past its targets for annual deficits and debt of 3 percent and 60 percent of GDP, respectively, were seen as too rigid to deal with country-specific issues, with

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<sup>10</sup> Since cross-border holdings are measured in dollars, at least some of the measured decline in exposure could be due to depreciation of the dollar relative to the Euro, in which much of these holdings are denominated. One can estimate an upper bound for this effect by assuming that all holdings are Euro-based. This adjustment does scale down but generally does not eliminate the largest apparent reductions in exposure shown in Figure 9. Also, some of the reductions may reflect shifts in assets from financial companies covered by the calculations to other entities that are excluded.

the natural result that they were frequently violated without significant consequences for the countries that transgressed. This led to modifications in 2005 intended to make the SGP more flexible and hence also more credible. On the other hand, the SGP failed to prevent the debt crisis in Greece, a failure that some have attributed to the fiscal rules and associated enforcement mechanism being too weak. This episode has led recently to the formulation of measures that would increase surveillance and sanctions, to give the SGP more bite.

The U.S. federal budget experience under various rules is also somewhat clouded. Although there is some evidence that the rules under different regimes over the past several decades had effects on certain aspects of government behaviour, not all of these effects were positive (for example, limiting countercyclical fiscal responses or even producing procyclical ones). Further, the endogeneity of the regimes' adoptions makes determination of their effects on overall indebtedness and fiscal sustainability difficult from an econometric perspective (Auerbach 2008). The problem, in short, is that it is difficult to distinguish between the rules having an independent impact and the rules' adoption simply signalling an increased commitment to budget control.

One lesson that may be drawn from these experiences is that it is very difficult to design workable budget rules, given the complexity of fiscal policy and the difficulty of adjusting for cyclical conditions. Moreover, focusing just on debt and current and near-term deficits, as budget rules typically have, is becoming increasingly inadequate, even when these aggregates are measured honestly and not distorted by financial engineering and misreporting. This is because the size and strength of long-term spending commitments that drive fiscal gaps also need to be taken into account.

But the construction of long-term projections and the assessment of long-term commitments require considerable judgment and assumptions, as the differences between the IMF and EC projections for Europe considered in Figure 4 illustrate. Estimates will vary considerably, for example, on the basis of what one assumes about future excess cost growth in health care spending, retirement behaviour and longevity. The considerable uncertainty associated with such projections puts pressure on the mechanism of budget rules, which need transparency and simplicity in order to be credible. Thus, improving budget rules of the traditional variety seems to be an extremely challenging objective. It is for this reason that an alternative mechanism might work better, in particular the establishment of a more independent entity to assess and identify weaknesses in fiscal performance.

There has been an important trend toward the creation of such independent entities for fiscal evaluation, including the Swedish Economic Policy Council, established in 2008, and the U.K.'s Office of Budget Responsibility, established just last year.<sup>11</sup> Such entities can assess complicated situations in a way that fiscal rules simply cannot. As is the case in the United Kingdom, the fiscal entity can also be given the power to lay out the economic and fiscal projections on which the government's policy evaluations must be based.

Some individuals have even suggested that independent fiscal authorities could potentially be granted the power to determine fiscal aggregates in much the same way that independent monetary authorities set monetary aggregates.<sup>12</sup> This further step is not very plausible, though, given the differences between monetary and fiscal policy. It is hard to believe that small, independent bodies can be legally empowered to force countries to change fiscal policies, given the political elements of fiscal policy determination; nor is it even clear how such a scheme would be implemented, given how limited an indicator of a country's fiscal trajectory its current debt is. For example, an annual deficit of a given amount could be

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<sup>11</sup> See Calmfors (2010) for further discussion.

<sup>12</sup> See Wyplosz (2008).

consistent with very different underlying fiscal policies depending on the composition of taxes and spending, marginal tax rates, the allocation of fiscal burdens among generations, and the implied path of future deficits.

Thus, fiscal policy councils should be viewed as having the potential to serve an important auditing role, rather than to directly constrain or determine fiscal policy. This limitation of what can be expected from fiscal policy councils is more superficial than real in comparison to what budget rules can do, if such rules apply in theory but not in practice. Further, more than simple budget rules, independent fiscal entities can expose gaps in logic and provide additional support and pressure for needed changes in fiscal policy that may require implementation over a period of years. This is still a relatively new mechanism, the design of which continues to evolve, but it may well play a much more important role than explicit fiscal rules in helping countries undertake the large and complicated fiscal adjustments that they now face.

## **7. The Path Forward**

Most of the world's major developed countries face a need for large fiscal adjustments. The recent world recession and financial crisis appears to have led to much greater focus on this need because of the large deficits that many countries have run during period and the resulting sharp increase in debt to GDP ratios. For some countries, the need for fiscal adjustment is imminent or already under way. For others, there is an uncertain amount of time for delay, at least in terms of the willingness of financial markets to accept additional debt. But the willingness of markets to continue to purchase additional debt is not an argument for delay, given the large adjustments that are needed, in particular to pension and health care programs for which abrupt changes may be difficult and socially damaging.

In the current environment, it is useful to identify three sources of fiscal imbalances, each of which must be dealt with in its own way. The first source is cyclical, attributable to both the automatic reductions in taxes and increases in spending that the recession brought and the countercyclical discretionary measures that governments adopted. The second source of fiscal imbalances is ongoing structural primary misalignments between revenues and spending that would exist in the short run even at full employment. The final source of fiscal imbalances is pension and health spending, which are projected to grow rapidly for most countries in the growing decades due to aging populations and continued excess cost growth in health care spending.

Cyclical deficits, if they are really just cyclical, are a minor fiscal problem, although their importance is sometimes magnified by the political process, which has an unfortunate tendency to focus on short-run economic developments. Though they are large when expressed on an annual basis, the deficits of the past few years have contributed little to countries' long-run fiscal problems, simply because they are temporary. The fiscal imbalances that will remain in the short term even after recovery are of more serious concern. Traditionally, these two sources of deficits have been the focus of policy, but the third source that now looms over the longer term is of much greater significance, both in terms of its size and its breadth, affecting countries that otherwise appear to have their fiscal affairs in order.

The "demographic and health" deficits that for many countries constitute the bulk of their fiscal imbalances present a number of challenges to the formulation and implementation of fiscal adjustments. First, standard budget control rules and other related mechanisms do not integrate longer-term adjustments in such "implicit" liabilities and so exert less pressure for undertaking these adjustments. Second, there is enormous uncertainty about the magnitude of these implicit liabilities, in particular because of the inherent difficulty of projecting health care costs. This makes the politics of adjustment more difficult, even though increased

uncertainty about future costs should, in principle, lead to even more budget stringency to avoid outcomes that are socially very costly.<sup>13</sup> Finally, because of life-cycle planning decisions with respect to labour supply and saving, cuts to old-age entitlement programs should be phased in over time, making it necessary for adjustments to be put in place far in advance of their full impact.

There is no simple formula for adjustment, because countries vary with respect to the severity of their imbalances, the composition of their imbalances among the different sources just discussed, and their fiscal capacity to absorb additional tax increases rather than relying on reductions in spending. The United States, for example, has a low tax-GDP ratio relative to many other countries considered here, and has no national-level consumption tax. As a consequence, there has been much discussion of introducing a value added tax to help deal with the U.S. fiscal imbalance.<sup>14</sup> More generally, tax reform via broadening of tax bases, both for direct and indirect taxes, is an attractive option as an alternative to increases in marginal tax rates, although continuing pressure through international tax competition makes substantial increases in revenues from some sources, notably the corporate income tax, an unlikely option.

Given their importance as a source of fiscal gaps, reform of pension and health care systems is clearly a central agenda item for most countries. But some countries have already introduced pension reforms in recent years, the effects of which are already included in the fiscal gaps reported here; and health care reform is a more complex issue, dealing as it does not simply with a system of taxes and transfers but also with the structure of a very large and complex series of markets and the incentives associated with their operations. The United States is not a typical country in the area of health care, given its relatively high reliance on the private sector and the large share of its GDP devoted to overall health care spending, but the recent U.S. debate still provides some suggestion of the difficulties that health care reform will face elsewhere. It should also be kept in mind as pension and health care reform are considered that, given the rapidly aging populations in many countries, an objective of holding spending constant as a share of GDP would translate into large per capita reductions in age-based spending.

Although the recent literature on fiscal consolidations has focused especially on tax increases versus expenditure reductions, it is important that reform plans go beyond this distinction in several dimensions.

First, tax increases can take a variety of forms, and structural reforms can involve considerably smaller increases in deadweight loss than increases in marginal tax rates. For some countries there is little choice, given how high their tax wedges already are, but this is an important consideration even where marginal tax rates are lower. Second, expenditure reductions vary considerably in their character and permanence. Reductions in discretionary spending may help address short-run fiscal problems, but they can play only a limited role in overcoming fiscal imbalances that reflect growing age-based entitlement expenditures. Third, the line between tax increases and expenditure reductions is not well-defined, so attention should be paid to the ultimate effects of policies, not whether they are labelled as changes in taxes or changes in spending. For example, elimination of tax expenditures through the tax reform process is little different from reductions in direct spending. There is no logical reason why a cut in tax expenditures should have a different impact on an economy than a comparable cut in direct spending. Finally, the distributional effects of policies are important, not simply in the standard static dimension but also on a generational basis. Particularly when so much public spending and public spending growth is associated with age-based

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<sup>13</sup> The reasoning is discussed in Auerbach and Hassett (2007).

<sup>14</sup> See, for example, IMF (2010a).

programs, alternative policies with similar effects on annual budgets can have enormously different effects on the intergenerational fiscal burden, for example an immediate increase in dedicated payroll taxes versus an immediate reduction in public pension benefits. Generational accounting illuminates these differences in a way that fiscal gap calculations alone cannot, and the widespread use of this technique (eg Auerbach, Kotlikoff and Leibfritz, 1999) makes it a standard tool available for evaluating fiscal reform programs.

Finally, political considerations will of course loom large in the fiscal reform process. Their role can be influenced through the design of fiscal rules and alternative institutions such as independent fiscal councils, as discussed above. But, as also discussed, fiscal gaps that are attributable to large implicit liabilities are not easy to deal with through traditional budget control mechanisms that focus on explicit debt and short-term deficits. Indeed, policies to deal immediately with long-term fiscal gaps could over the short term run result in large explicit budget surpluses (in order to accommodate longer-term spending growth), and the ability of the political process to sustain such surpluses is certainly questionable.<sup>15</sup> New approaches to budget control, and perhaps even to the standard methods of budget measurement, may be required to sustain such policies.

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<sup>15</sup> An illustration of this problem comes from the United States, which adopted large tax cuts in 2001 largely in reaction to the federal budget surpluses that then prevailed. The rhetoric at the time stressed that these cuts were needed to return money rightfully due to taxpayers and to avoid the elimination of the national debt (which would have presented a new challenge for the conduct of monetary policy), even though fiscal gap calculations at the time, even before the tax cuts were adopted, showed a positive fiscal imbalance. See Auerbach and Gale (2001).

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Table 1  
**General Government Net Debt to GDP ratios**  
 (Recent and Projected)

Country	2007	2010	2013	2016
Australia	-7.3	5.5	7.6	5.3
Austria	39.8	49.8	51.5	50.9
Belgium	73.3	81.5	83.9	86.5
Canada	22.9	32.2	36.3	33.0
Denmark	-3.8	0.9	8.1	6.0
Finland	-72.6	-56.8	-45.6	-36.6
France	54.1	74.6	80.6	77.0
Germany	50.1	53.8	53.9	52.6
Greece	105.1	142.0	157.0	145.5
Ireland	12.2	69.4	110.3	103.5
Italy	87.3	99.6	100.2	98.9
Japan	81.5	117.5	142.4	163.9
Netherlands	21.6	27.5	33.5	34.1
New Zealand	-5.7	4.6	14.7	11.7
Norway	-142.5	-156.4	-170.5	-186.0
Portugal	58.1	79.1	93.3	102.3
Spain	26.5	48.8	58.5	64.6
Sweden	-17.1	-14.6	-13.7	-16.3
United Kingdom	38.2	69.4	79.5	73.5
United States	42.6	64.8	79.3	85.7

Source: IMF, World Economic Outlook Database, April 2011

Table 2

**CDS Regressions**Dependent Variable: Average 2010, 3<sup>rd</sup> quarter CDS spread

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	-0.83 (0.01)	71.47 (1.28)	80.69 (1.74)	-8.55 (0.13)	-10.97 (0.21)	27.49 (0.69)	14.80 (0.47)
Fiscal Gap	32.00 (3.04)			23.69 (1.83)	40.90 (2.34)	-2.49 (0.34)	4.77 (0.46)
Surplus/GDP		-10.31 (1.87)		-3.54 (0.58)	-7.38 (0.82)	-9.21 (3.24)	-15.51 (3.74)
Net Debt/GDP			1.48 (2.44)	0.52 (0.65)	1.64 (1.41)	0.42 (0.96)	1.06 (1.65)
Adj. R-squared	0.315	0.122	0.217	0.293	0.486	0.439	0.596
N. Obs.	19	19	19	19	18	17	16
Outliers Excluded?	No	No	No	No	No	Yes	Yes
Interaction with External Debt Share?	No	No	No	No	Yes	No	Yes

Note: t-statistics are in parentheses

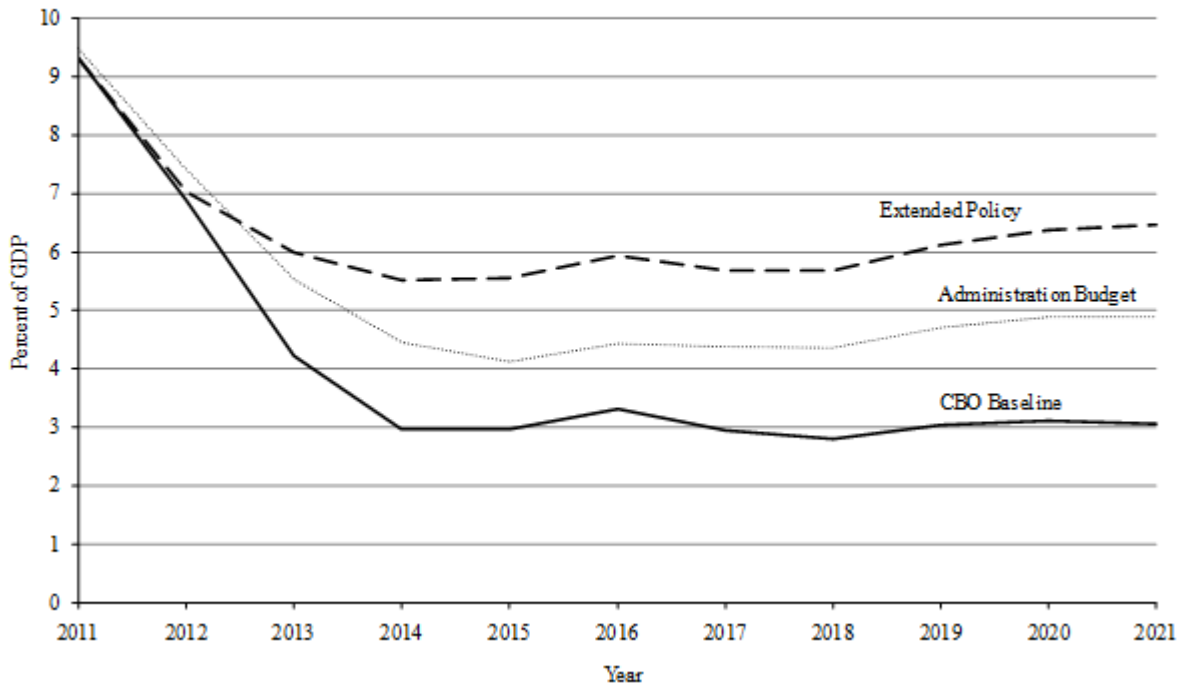
Table 3

**Yield Differential Regressions**Dependent Variable: Average 2010, 3<sup>rd</sup> quarter Benchmark Yield, Relative to Germany

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Constant	0.0058 (0.62)	-0.0051 (1.65)	0.0045 (0.54)	-0.0104 (2.38)	-0.0114 (2.19)	-0.0122 (1.82)	-0.0118 (1.49)
Fiscal Gap	0.0008 (0.56)			0.0009 (1.48)	0.0012 (1.17)	0.0012 (1.12)	0.0013 (0.71)
Surplus/GDP		-0.0017 (6.75)		-0.0017 (6.84)	-0.0030 (6.12)	-0.0017 (6.30)	-0.0030 (5.59)
Net Debt/GDP			0.00009 (0.88)	0.00002 (0.41)	0.00004 (0.55)	0.00003 (0.53)	0.00004 (0.44)
Adj. R-Squared	-0.083	0.832	-0.026	0.847	0.809	0.836	0.789
N. Obs.	10	10	10	10	10	9	9
Outliers Excluded?	No	No	No	No	No	Yes	Yes
Interaction with External Debt Share?	No	No	No	No	Yes	No	Yes

Note: t-statistics are in parentheses

**Figure 1. Alternative Deficit Projections, U.S. Federal Government 2011-2021**



**Figure 2. Alternative Debt Projections, 2011-2021**

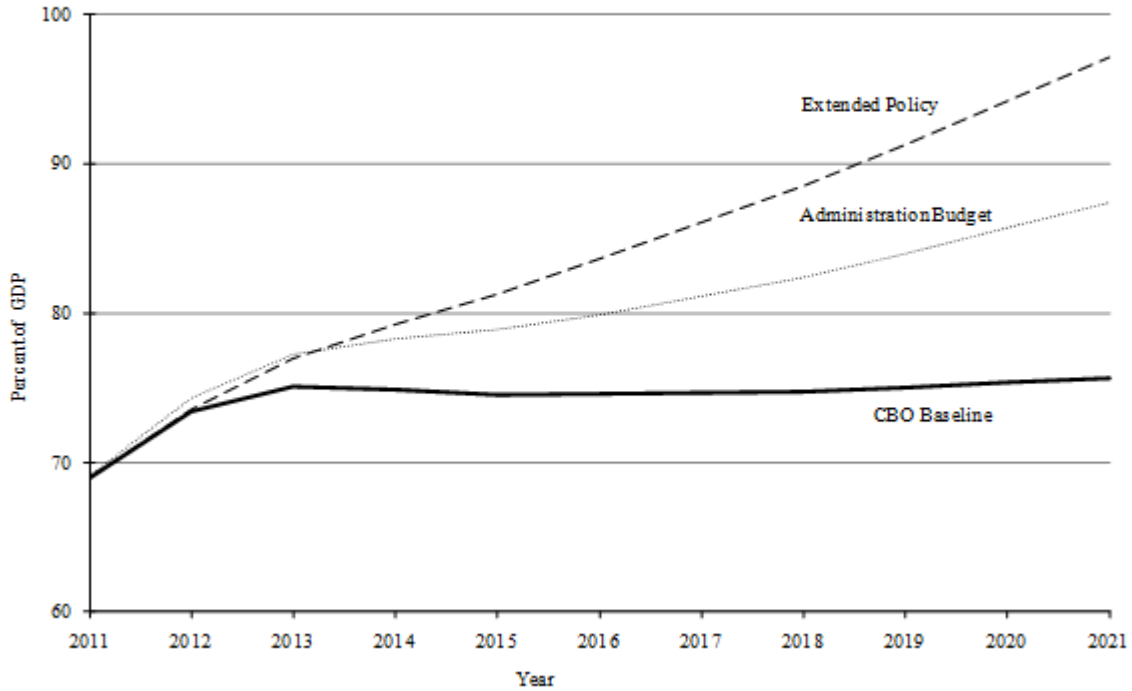


Figure 3. Fiscal Gaps through 2060

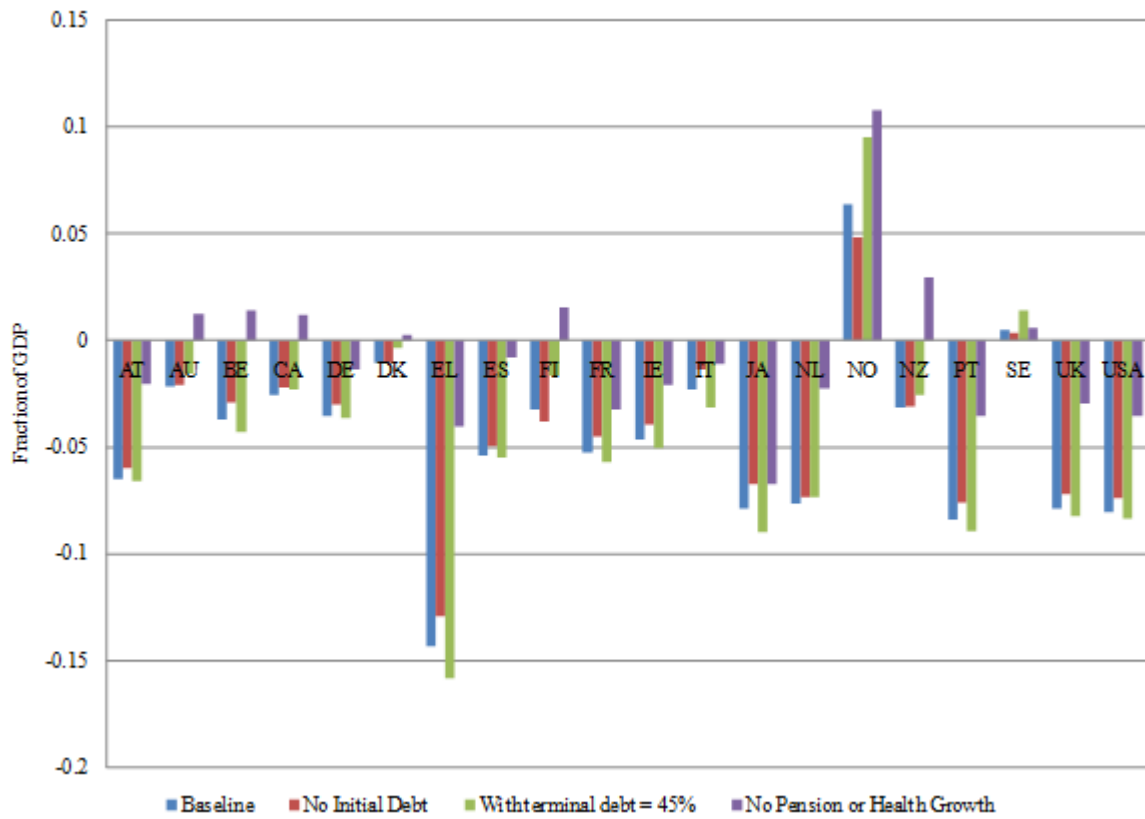


Figure 4. Fiscal Gaps through 2060, Alternative Projections

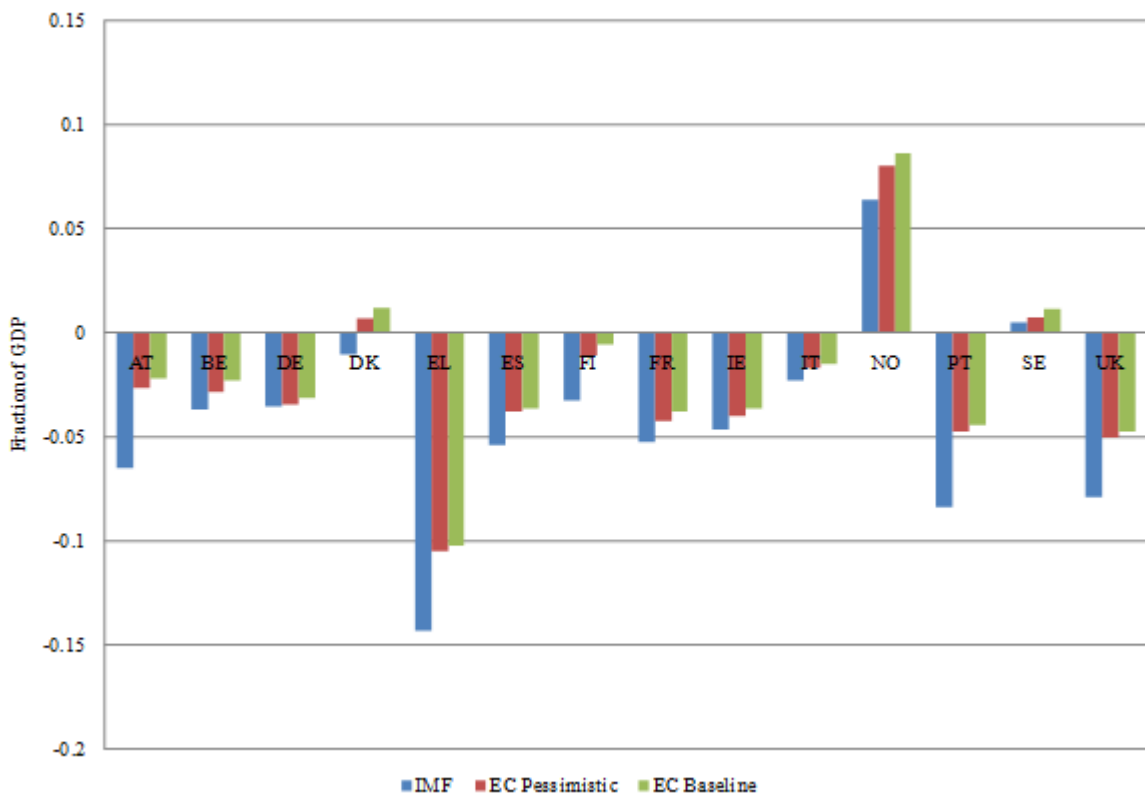


Figure 5. Fiscal Gaps versus Debt-GDP Ratios

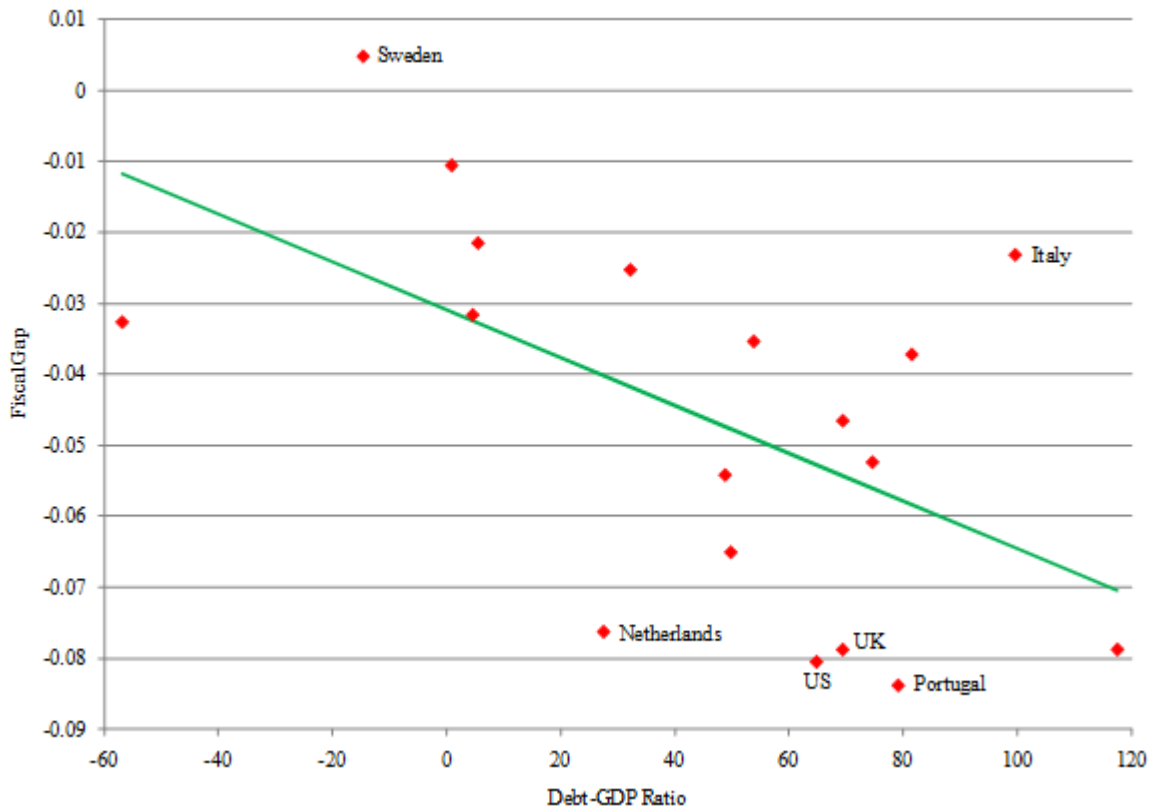
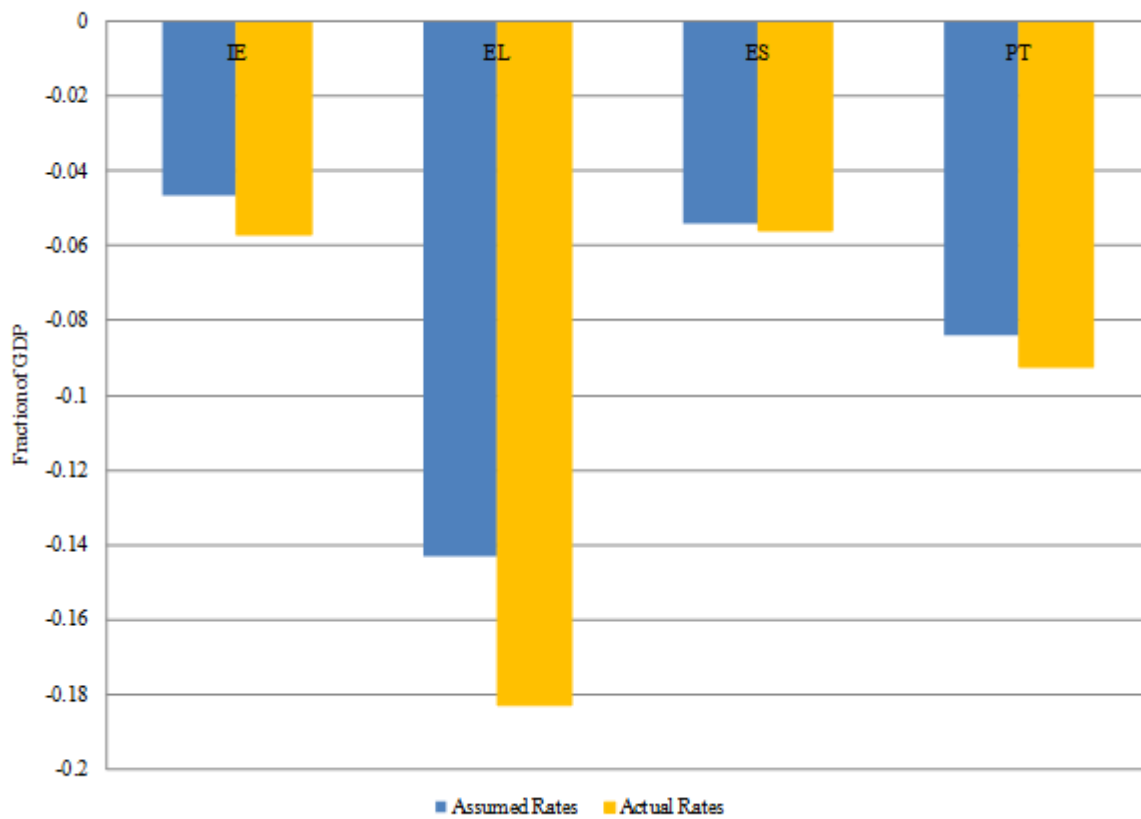
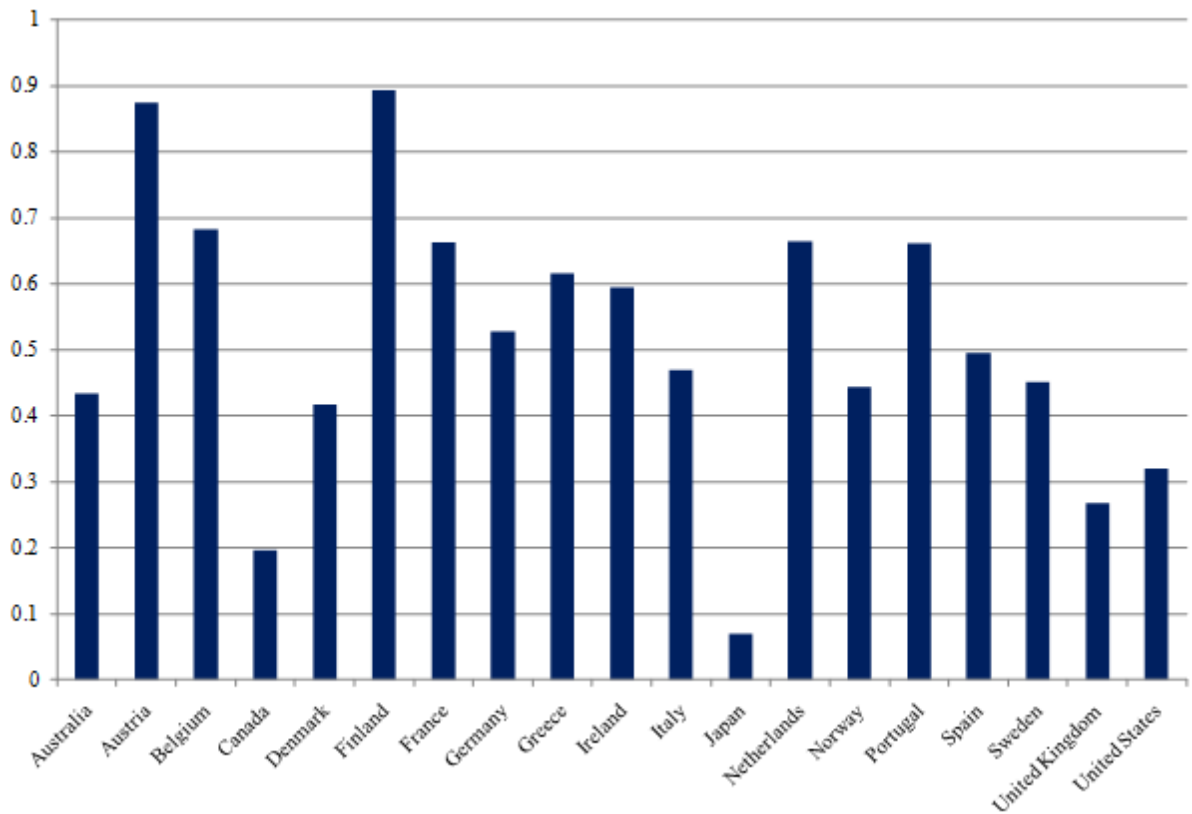


Figure 6. Fiscal Gaps, Different Interest and Growth Rate Assumptions

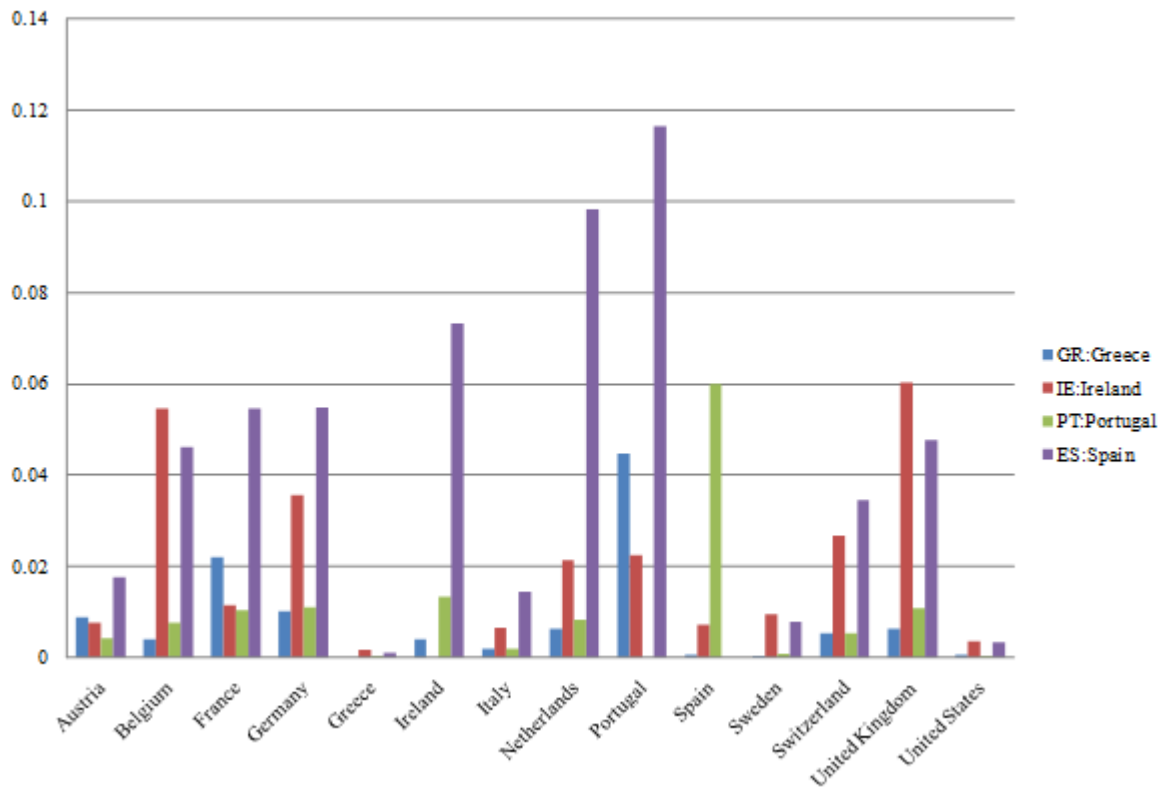


**Figure 7. Fraction of Gross Sovereign Debt Held Externally, 2010**



Source: IMF World Economic Outlook (April, 2011)

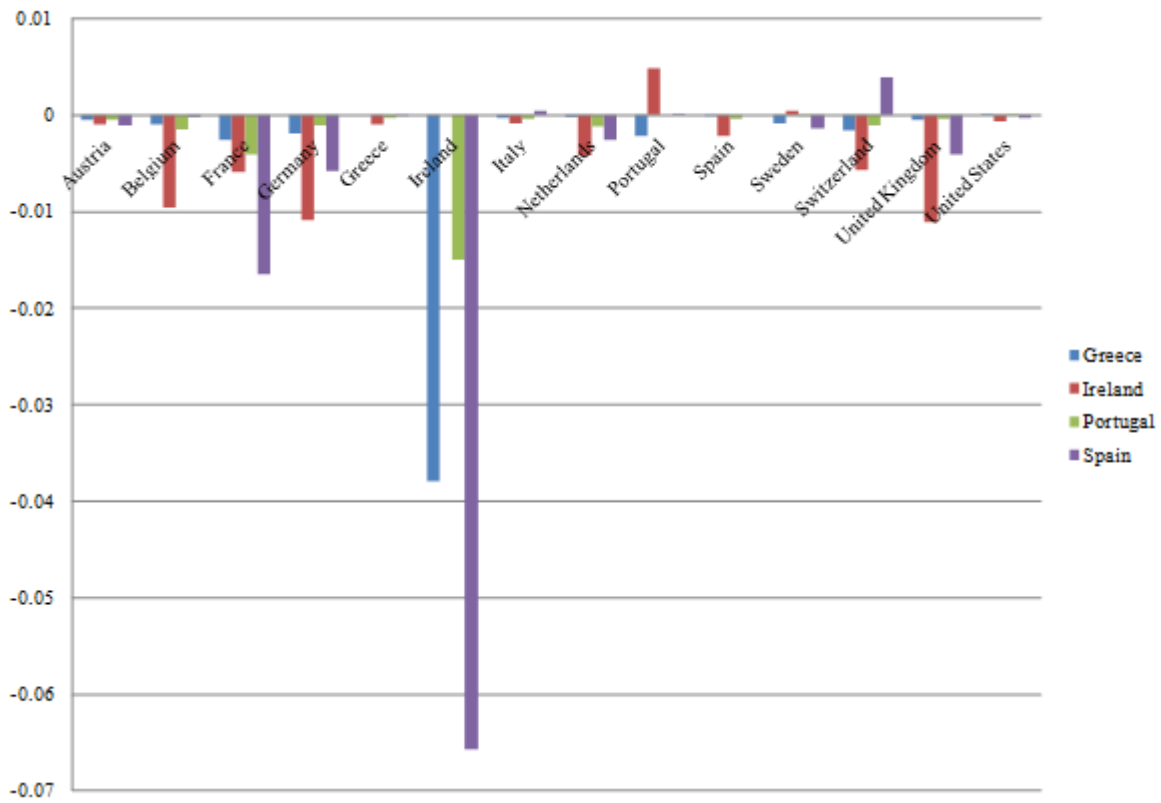
**Figure 8. Claims Relative to GDP, December 2010**



Sources: Claims: Bank for International Settlements, International bank claims, consolidated - ultimate risk basis (Table 9D)

GDP: IMF World Economic Outlook (April 2011)

Figure 9. Change in Claims Relative to GDP, Sept. - Dec. 2010



Sources: Claims: Bank for International Settlements, International bank claims, consolidated - ultimate risk basis (Table 9D)

GDP: IMF World Economic Outlook (April 2011)

# Long-term fiscal sustainability in OECD countries: Comment on Alan Auerbach<sup>16</sup>

Pier Carlo Padoan<sup>17</sup> and Paul van den Noord<sup>18</sup>

## 1. Introduction

Fiscal consolidation requirements facing OECD countries are very challenging. The price to pay for the rapid accumulation of public debt in the aftermath the financial crisis is high. Economic stagnation could persist, either because governments work off their unsustainable fiscal positions, or because they fail to do so and sovereign risk premia soar. In any case, fiscal consolidation is inescapable. But every challenge is an opportunity: consolidation should, and can, be made growth friendly to minimize the risk of stagnation. This can be achieved by combining efficiency-enhancing expenditure restraint and growth friendly revenue raising.

This paper draws extensively on the latest issues of the OECD's *Economic Outlook* and *Going for Growth* (OECD, 2011a and 2011b). It takes stock of the size of the fiscal consolidation requirements, the associated risks of economic stagnation and possible ways to make fiscal consolidation more growth friendly. Based on a technical scenario exercise, it considers macro-economic prospects for OECD economies to the middle of the next decade and the challenges and associated risks. It suggests that, while nearly all OECD economies are expected to improve their fiscal balances over the course of this year and next, for many this will still leave fiscal positions too weak to stabilize government debt while, for others, where debt is stable, it will be at levels which remain too high. Moreover, many countries will be undertaking fiscal consolidation over a prolonged period and there is a risk that the sustained adverse effects on demand delay the recovery and even risk stagnation. But the analysis also suggests that allowing public debt to accumulate could have a long-lasting adverse effect on the growth rate of output as well.

In this respect, countries face a difficult choice of having to front-load fast consolidation and reassure financial markets, but also increasing the risk of adversely affecting the recovery particularly if monetary policy is constrained. To improve the terms of this trade-off, countries should put greater weight on measures – for example raising retirement ages – which will improve long-term fiscal sustainability but which have relatively limited negative effects on demand. To reassure financial markets, it is also important to have a clear medium term fiscal plan specifying objectives and the instruments that will be used. In addition, structural reforms aimed at enhancing long-term income levels and welfare could yield important co-benefits for fiscal balances while enhancing growth. In particular, improvements in tax systems, or education and health care efficiency gains, could significantly ease the fiscal predicament.

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<sup>16</sup> This is an extended version of the comments by Pier Carlo Padoan.

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## 2. Gauging the fiscal sustainability requirement

To estimate the fiscal consolidation requirement, *OECD Economic Outlook* No. 89 presents a fiscal policy scenario built on a set of long-term macroeconomic projections, extending the short-term projections for the period 2011-12 up to 2026. The scenario incorporates simple rules of thumb regarding for instance the pace of slack absorption, the pace of normalisation of monetary policy and the responsiveness of bond yields to public debt. Relatively modest fiscal consolidation is assumed, aimed at stabilising public debt as share of GDP before 2026.

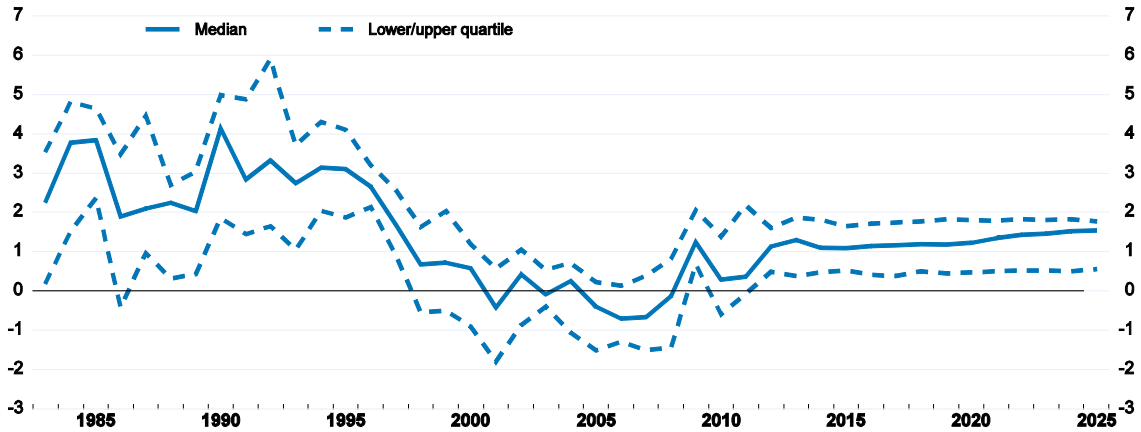
Specifically, starting off from projections for potential output, projections for the output gap – the difference between actual and potential output – are superimposed to obtain a growth path for actual GDP. An admittedly optimistic assumption underlying the long-term projection is the proposition that the crisis has had no permanent effect on the growth rate of potential output and only adversely affected its level. Moreover, actual output is projected to portray sustained above-trend growth in the period 2013-2015 as output gaps are closed by 2015, except in a few countries where the output gap in 2012 is exceptionally large (Greece, Ireland, Portugal and Spain) and the output gap is assumed to take longer to close.

Accordingly, from 2013 onwards the growth rate of OECD-wide potential output would be about 2% per annum., slightly below the average potential growth rate of 2¼ per cent per annum achieved over the seven years preceding the crisis. Most of the difference is due to slower growth both in participation rates and in the working-age population mainly reflecting demographic trends. Meanwhile actual output would grow at an average 3% per annum over the period 2010-15, to converge to the potential growth rate afterwards as the output is closed in most countries. A return to targeted inflation of approximately 2% is assumed once the output gap is closed, with the exception of Japan where deflation persists. Policy interest rates are assumed to normalise once the output gap closes. The differential between real long-term interest rates and real GDP growth – an important determinant of fiscal sustainability – is projected to be on a slight upward slope (Figure 1). During the years prior to the crisis, this differential was unusually favourable, even negative for many OECD economies, a situation that is very unlikely to re-emerge. Specifically, it is assumed that when gross government indebtedness passes a threshold of 75% of GDP then long-term interest rates increase by 4 basis points for every additional percentage-point increase in the government debt-to-GDP ratio – an assumption consistent with for example Égert (2010) and Laubach (2009). An exception is made for Japan, where the responsiveness of interest rates on debt is assumed to be only one-quarter that for other countries, to reflect the high proportion of debt which is financed domestically.

Figure 1

**The differential between real long-term interest and potential growth rate**

Percentage points



Note: 20 OECD countries chosen on the basis of having consistent time series estimates for potential output and long-term interest rates on 10-year government bonds from 1983.

Source: OECD (2011a).

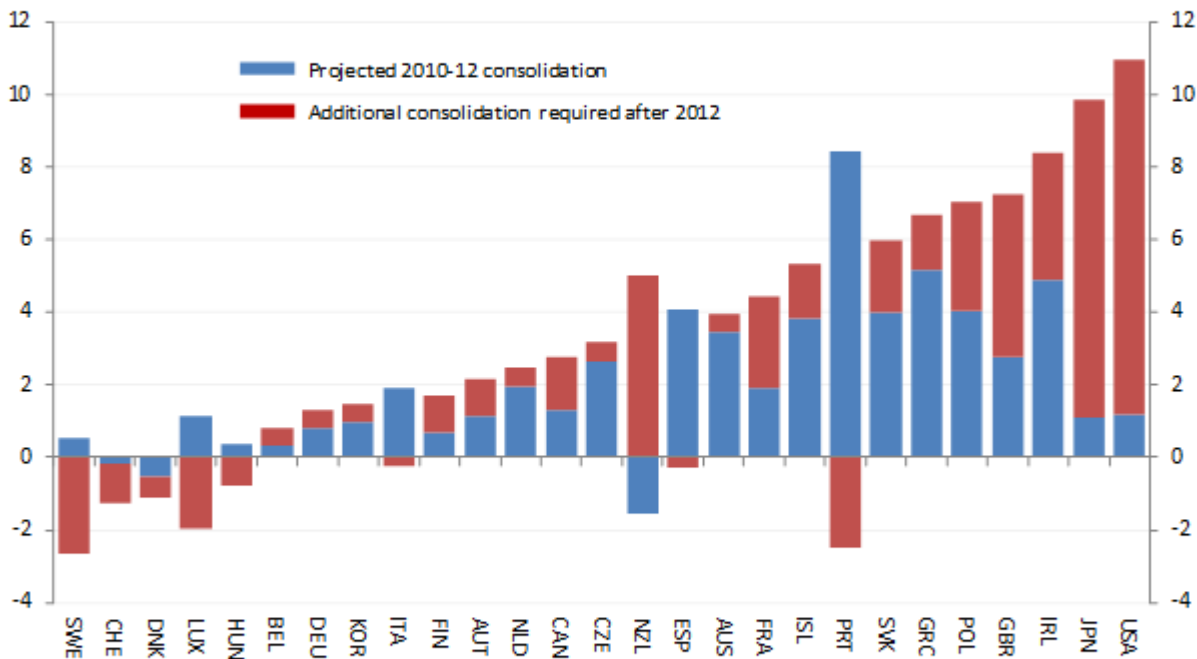
Another important determinant of fiscal sustainability is the initial primary fiscal position and projections thereof. According to the *OECD Economic Outlook* No. 89 fiscal deficits are still large in 2012 even if fiscal consolidation plans for the period up to end-2012 are fully implemented. Beyond 2012, the underlying primary balances are held constant as a share of (potential) GDP. This means that the effects of population ageing on the primary balance are nil or, equivalently, assumed to be offset by cuts in non-ageing related expenditure or tax increases. Despite this optimistic assumption, in the absence of further corrective action, debt will remain on an increasing trajectory many countries from 2013 onwards.

Hence additional fiscal consolidation is inevitable and is assumed to follow a stylised rule. Specifically, in the scenario, fiscal consolidation – gauged by the annual reduction in the underlying primary balance (excluding interest payments on debt) – is assumed to amount to ½ per cent of GDP per annum from 2013 onwards, maintained for as long as it takes to stabilise the ratio of government debt to GDP. At this relatively modest pace of consolidation there is a further build-up in the ratio of government debt to GDP until it levels off.

Figure 2

**The fiscal consolidation requirement in the base line scenario**

Required improvement in the primary balance in 2026, per cent of GDP



Note: Consolidation through 2011 and 2012 as projected in OECD *Economic Outlook* No. 89, consolidation after 2012 assumed to be an additional ½ percentage points of GDP each year for as long as it takes to stabilise the debt-to-GDP ratio before 2026.

Source: OECD (2011a).

The scale of consolidation required to stabilise debt-to-GDP ratios both in relation to 2010 and following the projected consolidation from 2012 in this scenario is shown in Figure 2. The results can be summarised as follows:

For less than one-third of OECD countries, the efforts announced already for the short term are sufficient to require no further fiscal consolidation to stabilise debt beyond 2012.

Among those countries requiring the most fiscal consolidation are the two largest OECD economies, the United States and Japan. Their fiscal consolidation requirement is of the order of 10% of GDP (with the assumed consolidation effort of ½ percentage point per annum required to extend beyond the period 2013–26 to stabilise debt) and meeting that requirement would in fact still not be sufficient to stabilise the debt-to-GDP ratio.

Other countries for which consolidation requirements are large just to stabilise debt include Greece, Ireland, Poland, Portugal, the Slovak Republic and the United Kingdom, which all require cumulative consolidation of about 6 to 8½ percentage points of GDP from their 2010 positions.

In this scenario, OECD general government gross debt is projected to increase by about 32 percentage points of GDP relative to pre-crisis levels and by about a further 17 percentage points of GDP by 2026. The magnitude of the area-wide increases in debt is a reflection not least of the magnitude of the increase in some of the largest countries. In particular, the increase in debt by 2026 compared to pre-crisis levels for the United States and Japan is over 80 percentage points of GDP, whereas the median increase across all OECD countries is 21 percentage points of GDP.

### 3. The risk of economic stagnation

A central assumption underlying the above scenario is that the financial crisis has had an adverse effect on the level of potential output only, without any lasting effect on its growth rate. While this is in line with the average experience following past banking crises (Cerra and Saxena 2008, Furceri and Mourougane 2009, Reinhart and Rogoff 2009, Abiad *et al.* 2009), such outcomes cannot be taken for granted in the present context. For instance, analyzing the consequences of six severe OECD banking crises, Haugh, Ollivaud and Turner (2009) find that in one important case, that of the Japanese stagnation in the wake of the stock market and property bust at the end of the 1980s, is there evidence of a reduction in the potential growth rate. They attribute this to the protracted nature of the banking problems and the resulting misallocation of capital. In the context of the current crisis this highlights the importance of resolving outstanding banking problems, especially in Europe where a combination of financial weakness and lack of transparency about exposures by some financial institutions represent a downside risk to the growth outlook.

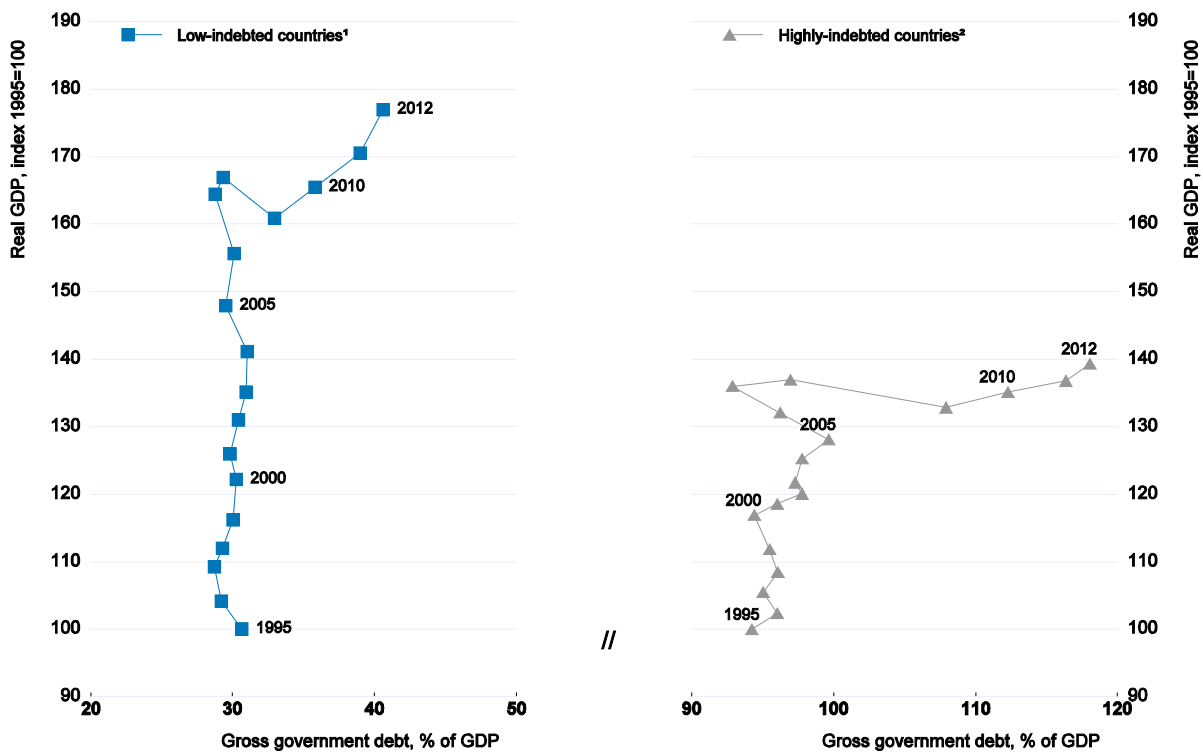
A second, possibly even more disquieting, source of concern about growth prospects is the rapid build-up of government indebtedness in the aftermath of the crisis. It is a stylized fact that, on average, countries with high gross public debt-to-GDP tend to portray lower GDP growth (Figure 3). The transmission by which this occurs is likely to involve higher interest rates and a crowding out of private investment and R&D, with adverse consequences for trend productivity growth. The causation may also run in the opposite direction to some extent, as slower growth will obviously contribute to debt accumulation. But if anything this underscores that growth enhancing structural reform is necessary to support and facilitate fiscal consolidation.

The literature suggests a negative impact on growth once government debt passes a certain threshold, typically around 75% or 90% of GDP. For instance, Reinhart and Rogoff (2010), estimate that the median real per capita GDP growth rate in advanced economies falls by one percentage point when gross public debt reaches 90% of GDP (average growth falls even more). Kumar and Woo (2010), estimate that each 10 percentage point increase in the debt-to-GDP ratio is associated with a slowdown in annual real per capital GDP growth of about 0.15-0.2 percentage points per year for advanced economies, the effect being larger when debt goes above 90% of GDP. If applied to the long-term projections described above the estimates imply a loss in the trend GDP growth rate of  $\frac{1}{2}$  -  $\frac{3}{4}$  percentage point on average in the OECD as a whole. Many OECD countries would appear vulnerable with the gross debt-to-GDP ratio in more than half of all OECD countries projected to rise above 75% and in nearly one-third of OECD countries above 90%.

There is a trade-off between slowing the accumulation of government debt to stave off its possible negative effects on growth and the risk that fiscal consolidation itself may create headwinds on the recovery and lead to stagnation. The size of the adverse demand effects will vary by country and depend on the size of the initial fiscal imbalance, the credibility of the fiscal consolidation plans (in view of its impact on sovereign risk premia), the scope to cut policy interest rates, the fiscal instruments used and the speed of consolidation.

Figure 3

**Public debt and growth performance**



<sup>1</sup> Low-indebted countries are those with gross government debt of less than 60 per cent of GDP for the duration of the period 1995-2012: Australia, Switzerland, Czech Republic, Estonia, Korea, Luxembourg, Norway, New Zealand, Slovak Republic and Slovenia. <sup>2</sup> Highly-indebted countries are those with gross government debt remaining above 60 per cent of GDP for the duration of the period 1995-2012: Austria, Belgium, Canada, France, Greece, Israel, Italy, Japan and Portugal.

*Note:* The real GDP indices for each group are calculated on the basis of the unweighted growth rates of individual countries within each group. Likewise, gross government debt as a percentage of GDP is calculated using the unweighted average for the individual countries within each group.

*Source:* OECD Economic Outlook 89 database.

The terms of the growth trade-off between fiscal consolidation and debt accumulation can be further eased by placing more weight on measures that improve long-term fiscal positions and which have relatively limited immediate negative effects on demand. For instance, raising the retirement age can at the same time reduce long-term fiscal pressures and have a positive impact on potential growth from higher labour participation. It may even raise aggregate demand in the short run as people need to save less for retirement. Consolidation should also avoid measures, such as public support for R&D, which weaken the supply side and instead target measures which strengthen it. The following section has a discussion of fiscal consolidation instruments on both the revenue and expenditure side that promise to be particularly “growth friendly”.

#### 4. Making fiscal consolidation more growth-friendly

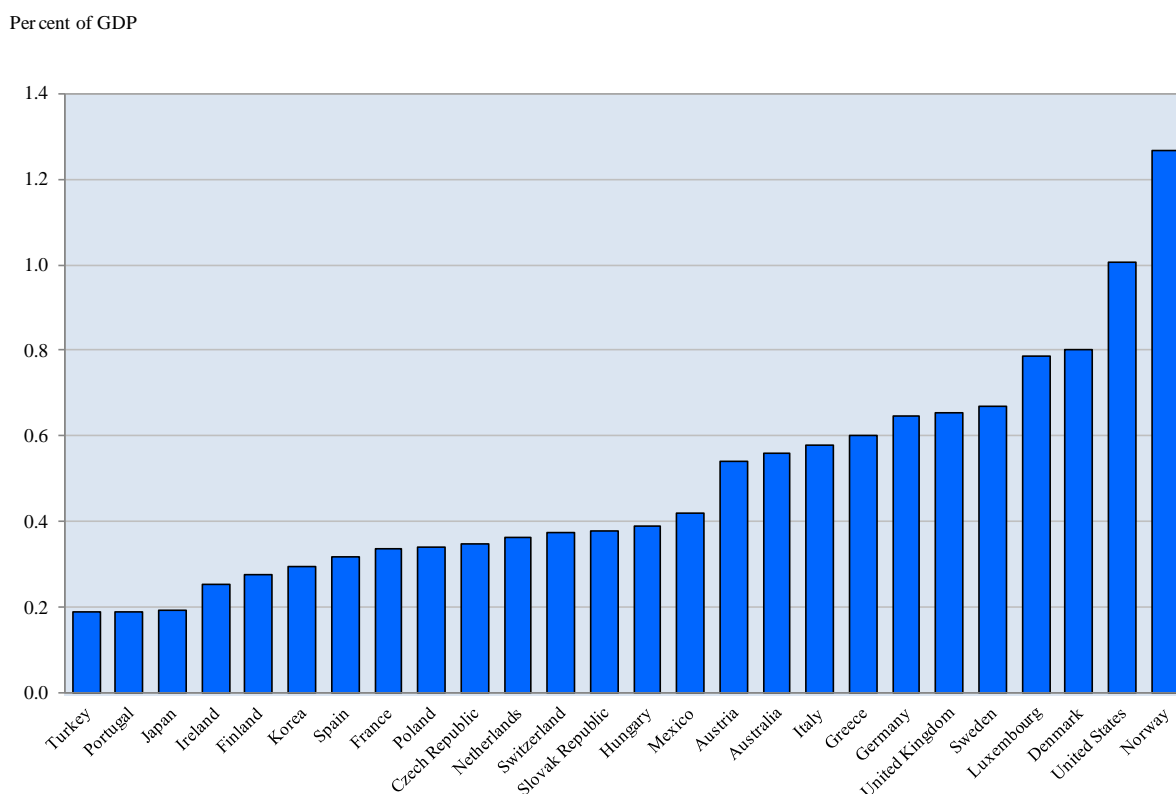
For most countries, present consolidation plans envisage some mix of spending restraint and revenue-raising measures. The choice of consolidation instruments needs to take into consideration their impact on a range of policy objectives beyond budget consolidation,

including short-term aggregate demand, economy-wide efficiency and equity, as well as their political acceptance. Each consolidation instrument has its advantages and disadvantages, but the possible trade-offs may be less stark when considering a broad package of different measures that contribute to both raise potential output and consolidate budgets (OECD, 2011b). In practice this means that budget-friendly structural reform and growth-friendly fiscal consolidation largely overlap.

#### 4.1 Growth-friendly spending restraint

Reforms of disability, sickness and unemployment benefit schemes, along with old-age pension systems and *de facto* early retirement schemes, could contribute to immediately improve fiscal balances while boosting employment and thereby raising tax revenues in the longer term. Such reforms include *inter alia* tighter eligibility criteria to disability benefits, cuts in the level and/or duration of unemployment benefits or increases in minimum retirement ages. Phasing out crisis-related increases in benefit levels and/or duration as unemployment goes down would also raise labour utilization, with direct benefits for public budgets. This may be particularly important in view of the labour reallocation needed in the wake of the crisis.

Figure 4  
Potential cost saving in primary and secondary education



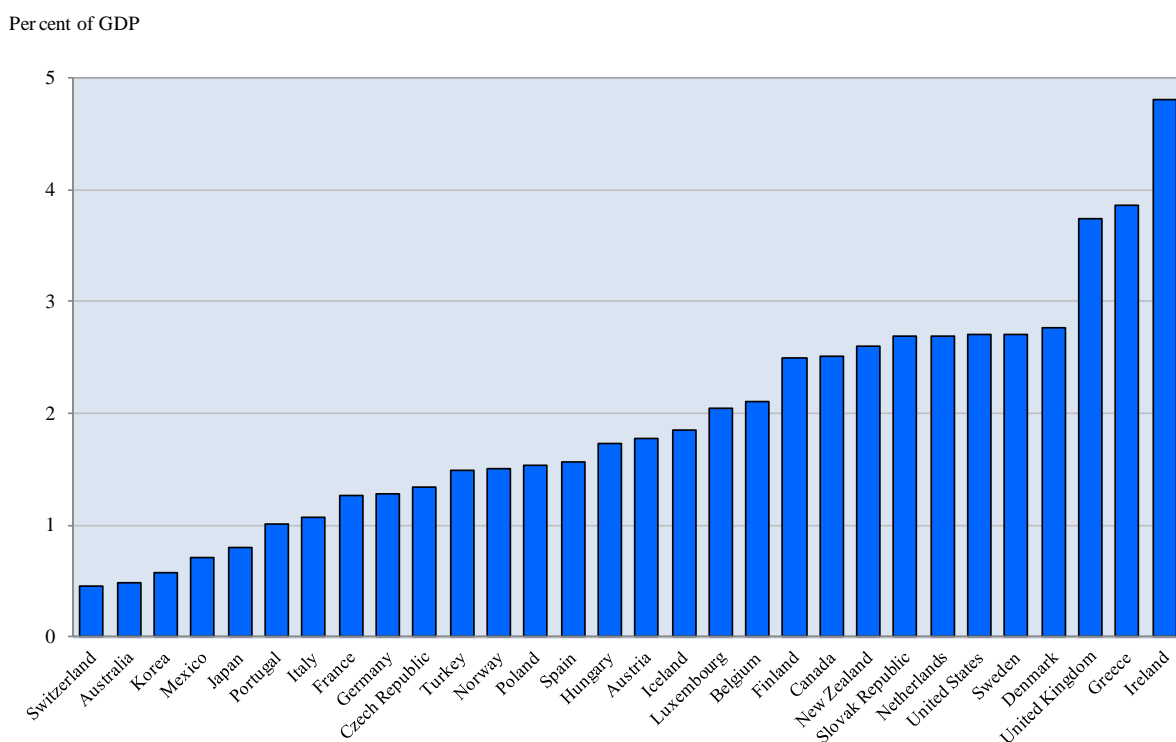
Source: OECD (2011b)

Public spending efficiency is another key policy area where reforms could allow for reduced expenditure, while maintaining or even increasing outputs. In particular, improving the efficiency of education systems is a key policy objective in almost all OECD countries. Recent OECD analysis suggests that substantial fiscal resources could be saved in underperforming countries through the gradual adoption of best practices in primary and

secondary education, which currently cost on average about 3% of GDP. The estimated potential cost savings, with no prejudice to education outcomes, amount to 0.2% to 0.4% of GDP per annum for most countries, while reaching 0.6% to 1.3% of GDP for several European countries and the United States (Figure 4). Reforms in this area might include *inter alia* the possibility for pupils and/or their families to choose between schools (therefore making schools more responsive to needs), a definition of performance objectives for public educational institutions along with incentives to reach them, and devolution of responsibilities to sub-central governments.

Improving health care sector efficiency could deliver even larger fiscal gains. Efficiency gains hold the promise of sizeable cost savings given that overall health care spending accounts for about 9% of GDP (6% when considering only public spending). Potential savings are estimated here as the reduction in public spending that could be achieved by moving towards the efficiency levels of best-performing countries while improving health outcomes – as measured by life expectancy gains – at a similar pace as over the past decade. Such savings in public expenditure could amount on average to about 2% of GDP, and they appear particularly sizeable for Greece, Ireland and the United Kingdom (Figure 5).

Figure 5  
Potential cost saving in health care



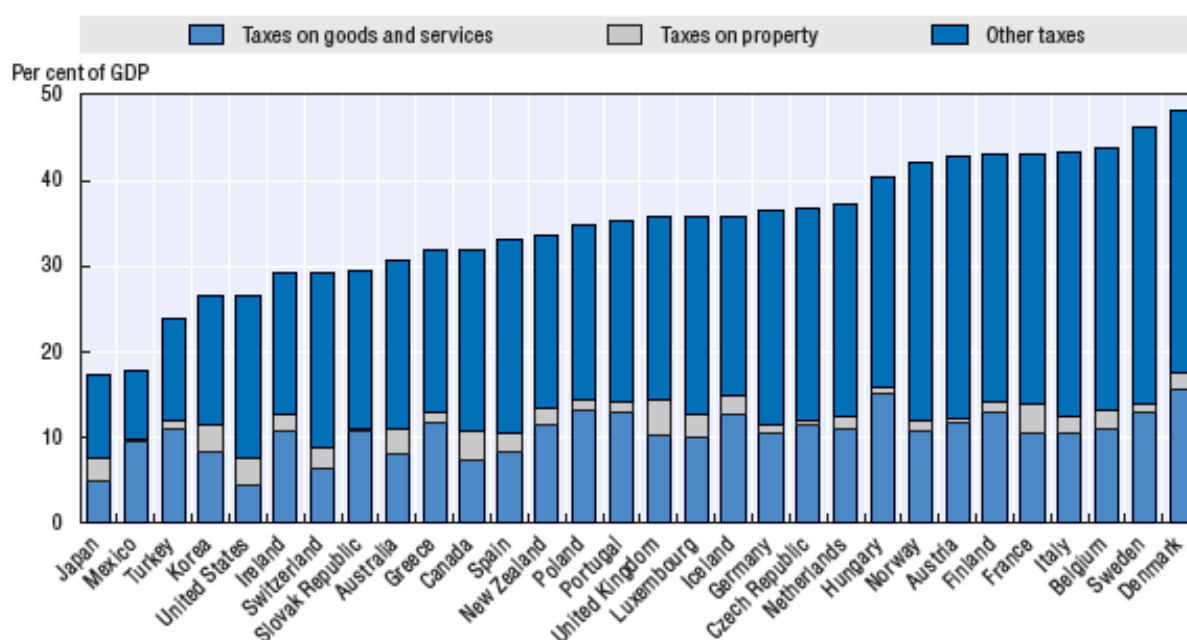
Source: OECD (2011b)

Public subsidies, when not addressing market failures, distort resource allocation and hurt productivity. Subsidies across the OECD range from about 0.1% of GDP in Greece to 3.9% of GDP in Switzerland (OECD 2010). However, the total level of subsidies is likely to be higher than national accounts suggest, both because some transfers that effectively subsidize certain sectors or activities might not be recorded as subsidies (notably capital investment grants) and because tax expenditures unrecorded in the national accounts effectively add to subsidization – see below.

## 4.2 Growth-friendly revenue measures

While difficult to quantify, tax expenditures have probably increased over time, notably in order to address market failures or income distribution concerns. They may now be very large, possibly close to 20% of total tax revenues in Italy and the United States and 30% in the United Kingdom. When an alternative cost-efficient way to reach the same objectives exists, removing them is recommended as they need to be offset by other taxes and thereby generally increase distortions in the tax system. Tax expenditures also make tax compliance more difficult. In several countries, broadening tax bases by reducing tax expenditures would enhance the efficiency of the tax system by enabling a reduction in tax rates and by cutting economic distortions and administrative compliance. Improving the effectiveness of tax administrations in tax collection and the fight against tax evasion is an important way to both enhance tax efficiency and reduce fiscal deficits, and the amounts of tax revenues involved can be significant.

Figure 6  
Tax revenue and mix<sup>1</sup>



<sup>1</sup> 2008, except of Australia, Belgium, Mexico, the Netherlands and Poland, 2007.

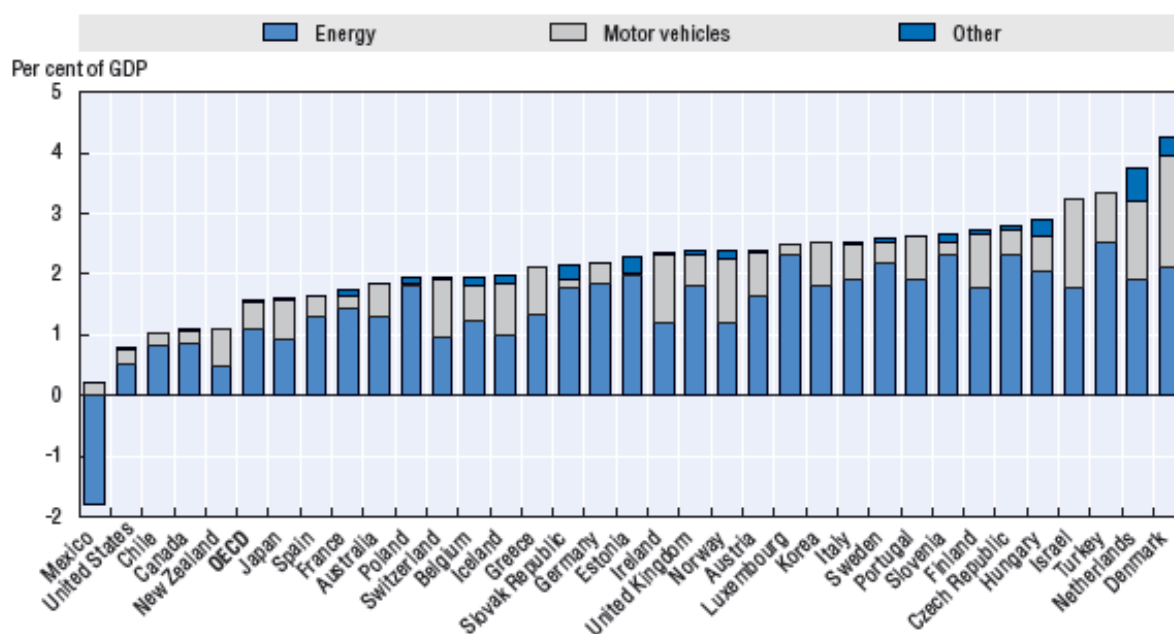
Source: OECD (2011b)

Even if revenue neutral, tax reforms can also make some indirect contribution to fiscal consolidation through their medium-term effects on income, productivity and tax receipts. For most OECD countries, recent empirical evidence points to significant impacts on productivity and investments from changes in tax structure involving lower personal and corporate income taxes offset by higher consumption and property taxes, alongside tax-base broadening accompanied by lower marginal tax rates. Specifically, there is room for changes in countries where these indirect taxes are comparatively small such as in Japan, the United States and several European countries (Figure 6). Cuts in labour tax wedges to offset increases in indirect taxes could have positive effects on employment and indirectly contribute to fiscal consolidation, as higher employment implies more tax revenues and less spending over the medium run.



Finally, policies to tax public “bads” such as pollution could enhance welfare (though not GDP as conventionally measured) while assisting fiscal consolidation. Pollution pricing mechanisms such as green taxes or auctioning of emission permits should generally be preferred to green subsidies, as the latter increase budget deficits and are not cost-effective tools to address environmental issues more broadly. Revenues from environmental taxes vary widely across countries (Figure 7). They remain low in *inter alia* Canada and the United States, implying some apparent scope for reaping further revenues from this source. In particular, the potential fiscal revenues from pricing greenhouse gas emissions is sizeable at 2.5% of GDP on average by 2020 if all industrialized countries were to use carbon taxes or auctioned emission trading permits to reduce emissions in each of them by 20% relative to 1990 levels. Opportunities to raise additional receipts emerge also from the existence of disparities in environmental-related tax rates within countries to the extent they do not generally reflect differences in the magnitude of negative externalities.

Figure 7  
Environmental tax revenues



Source: OECD (2011b)

## 5. Concluding remarks

In spite of some improvement in fiscal positions, consolidation requirements to merely stabilize debt are substantial for many countries. The United States and Japan, for which such requirements are among the largest, have yet to produce credible medium-term plans while other countries need to bolster medium-term fiscal targets by specifying the measures that will be implemented to achieve them. For most countries, further action would be needed to bring debt levels back to pre-crisis levels. The overall scenario has changed with respect to the pre-crisis situation when a significant contribution to fiscal sustainability came from the fact that interest rates were well below growth rates. This is unlikely to be the case in the years to come as interest rates will rise and growth could be slower. Lower growth would feed back negatively on fiscal consolidation, while evidence shows that in turn, beyond some thresholds, public debt levels have a negative impact on growth. It would be dangerous to

believe that higher inflation could address debt sustainability. Higher and persistent inflation could damp real growth by raising price and exchange-rate volatility. It could also risk unhinging inflation expectations, with the result that interest rates would soon increase more than inflation. By contrast, structural reforms, while boosting growth, can help fiscal consolidation by increasing efficiency in the provision of key services such as health and education. In a similar vein, the fiscal challenge should be taken as an opportunity to reform taxation, reducing its disincentives to work, save and invest while also becoming more conducive to promoting green growth.

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# Fiscal Policy in the Longer Term: Comment on Alan Auerbach

Ray Barrell<sup>19</sup>

Fiscal policy and the possibility of debt default are central to policy discussion at present, with all major economies experiencing increases in their public sector debt stocks. However, as Auerbach discusses, the build up of implicit liabilities in health and retirement commitments are far more worrying than are the issues to do with net government debt we currently face, although these are important. We begin by discussing shorter term issues around fiscal rules, and then address longer term issues around retirement. Problems with government debt, both explicit and implicit, are the consequences in part of the institutions we design that may or may not constrain the behaviour of governments and the private sector. Hence it is important to consider the redesign of institutions when considering fiscal issues.

In this note we want to discuss two such institutions in order to elaborate on some of the important points Auerbach raises. We do not address the important issues of rising spending on health care that follow in part from an aging population, but also from changes in technology that may increase healthy life expectancy rather less than they change overall (and hence unhealthy) life expectancy. The first issue we address is the relationship between government debt, financial regulation and the possibility of default. If a country has much of its net debt owned at home a default is similar to a wealth tax on its citizens, and can be decided upon in the light of the costs and benefits of default, wealth taxes and other (distorting) taxes. If debt is owned abroad default may become much easier, as the tax is imposed on non-citizens. We discuss this in the light of current problems in Europe, and reflect on the benefits of constraints on behaviour that might ensure spillovers and the scale of sovereign debt problems were limited. The second issue we address is directly related to pensions and retirement. Life expectancy has been rising in all OECD countries, but retirement ages have not risen in line. The implicit pension commitments produced by this, and by a changing age structure, lead to very large implicit debt given current and projected tax rates. In order to meet these requirements tax rates have to rise, pension replacement rates have to fall or the number of pensioners has to be reduced. We follow Barrell, Hurst and Kirby (2010) and look at extending working lives in the OECD, and also undertake a specific case study of the US as it has some peculiar institutions.

## Fiscal Policy and Macroprudential Tools

The financial crisis that struck the OECD in particular led to a significant increase in gross and net debt stocks in a number of countries and there are clear worries about default, especially amongst the smaller countries in European Monetary Union. There are several ways to assess these risks, and Auerbach looks at both Credit Default Swaps (CDS) and interest differentials relative to the Bund on long term debt, both of which tell similar but not identical stories. These spreads and swaps are potentially explained by the current surplus and perhaps by the implicit and explicit debt stock as a per cent of GDP. The more important

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<sup>19</sup> Brunel University, London. This work was undertaken whilst on the staff of the National Institute in London.

I would like to thank Alana Auerbach, Dawn Holland and Simon Kirby for comment on an earlier draft of this note, and participants at the BIS conference in Lucerne in June for comments on the presentation.

of the debt measures is perhaps the Fiscal Gap (or implicit debt) especially when account is taken of the scale of foreign holdings of sovereign debt, with more foreign holdings increasing potential spreads.

It might be the case that fiscal rules could help reduce borrowing in future, although the failure of the Stability and Growth Pact in EMU and of the Code for Fiscal Stability in the UK do not bode well. As Auerbach explains US experience has also been mixed. There are other institutions that can be designed that might help, with independent monitoring of fiscal actions at the centre of their remit. The bias toward deficits in the advanced economies is in part a consequence of the political cycle, but also results from the tendency of politicians to believe their own rhetoric, and become persuaded that their policies have raised trend growth and hence given more space for tax cuts or spending increases. An independent forecast monitoring body would have been useful in the UK in the last decade, as fiscal policy was clearly too loose, and based on politically charged perceptions of the potential growth rate and the state of the cycle. The new Office for Budget Responsibility should reduce this tendency to unjustified optimism, but as with all institutions of this sort set up in a parliamentary democracy, it can be abolished by the next government. Constitutionally binding arrangements are harder to design, but would be more valuable, as would market based incentives. For instance constraints from outside on the sale of government debt to foreign residents may be an effective way of tying hands, but it is one we have abandoned, at least in Europe in the recent past.

The sovereign debt crisis that has emerged in Europe is a relatively new phenomenon that may be related to the creation of EMU, and reflects risks that were not fully taken into account when the fiscal and monetary framework was designed. There have been no sovereign debt defaults amongst advanced OECD industrial countries since 1948, when Germany defaulted on some debts. The larger OECD countries have tended to have their public sector debt held by their domestic banks and their domestic residents. As an example, only 6.6 per cent (of the 190 per cent of GDP) of the Japanese gross government debt is held abroad; if the government defaults so then do Japanese banks and life insurers and pension funds, and they will have to be bailed out by the Japanese government. If the Japanese government defaults, then Japanese citizens will face an effective wealth tax, and the polity may prefer just to continue to transfer cash amongst themselves. In a polity where a government is representative of its citizens and responsible to them, the incentive to optimally default is very limited if debts are held within that polity. However, if debt is largely external, as was the case with Argentina in 2001, then the incentive not to default would be lower.

Table 1 gives the level of government debt and the foreign ownership of government debt in a selected group of countries prior to the formation of EMU and for 2009, whilst figure 1 gives a snapshot of holdings in 2009 (on a similar basis) for a larger group of countries. There has been no long-run upward trend in the share of government debt held abroad in Canada, Denmark and Sweden, and only a marginal change in the UK. As government debt as a per cent of GDP fell in the first three countries in this period, the amount of risk shifted abroad fell, whilst it rose in the UK. These countries each have an independent monetary authority and their own fiscal authorities. There can be no more incentive to default in the polity now than there was fifteen or more years ago. Government debt held outside the country is subject to exchange-rate risk, and hence is of less value to foreigners than to domestic residents whose liabilities are also in domestic currency.

There has been an alarming increase in gross foreign assets and liabilities around the globe, and it is not clear that this reflects optimal risk-sharing. Part of the rise in gross cross-border debt has taken place within the Euro Area, as is implied by this table. Euro Area countries do not face exchange-rate risk when dealing with each other. This has given an incentive for the stock of government debt to become internationalised within the area. As we can see from figure 1, 76 per cent of the total Greek government debt stock (or 90 per cent of GDP) was held abroad at the end of 2009. The Bank for International Settlements (Adjiev *et al.*, 2010)

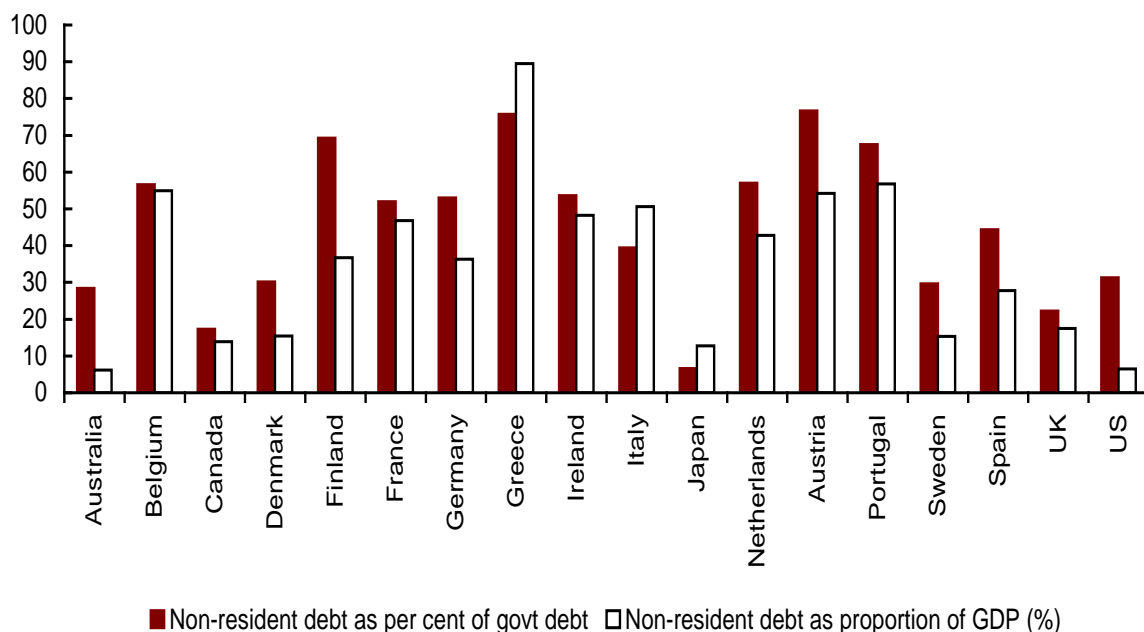
estimates that Greek government debt held in banks in other Euro Area countries amounted to 30 per cent of Greek GDP at the end of 2009. In these circumstances default becomes a different option for a polity. It is no longer a wealth tax, but rather an option to be exercised if it can be combined with no borrowing in the future, so that increases in spreads we might see would not impinge on Greek taxpayers.

Table 1  
The Evolution of Government debt shares

	Austria	Canada	Denmark	Finland	France	Spain	Sweden	United Kingdom	United States
Proportion of government debt held abroad									
1995	0.36	0.28	0.42	0.53	0.25	0.23	0.41	0.20	0.24
2009	0.78	0.14	0.43	0.96	0.67	0.47	0.40	0.23	0.50
Gross government debt as a percent of GDP									
1995	66.7	99.6	79.5	65.3	62.6	65.7	81.2	56.3	69.7
2009	69.4	79.7	48.6	53.2	86.7	57.1	51.9	74.2	78.8
Shift in fiscal exposure									
2009–1995	29.958	-16.202	-12.538	16.147	42.816	11.206	-12.887	5.670	22.716

Source OECD Debt Statistics and NIESR database

Figure 1  
Foreign Country Holdings of Government Debt  
(end 2009)



Source Bank for International Settlements

The creation of EMU has inadvertently changed the incentives faced by policymakers in financial crises, and there are a number of ways to deal with this. The most commonly discussed is the creation of a Euro Area fiscal authority with the power to tax and spend. In order to align incentives with debts, this authority must have the right to raise specific taxes in individual countries so that there is no longer an Argentine incentive to default. This may indeed be the only way to ensure the Single Market in Financial Services survives, but the taxation agreement will have to be made with all member states excluding the UK and Denmark who have an opt-out from monetary union. This would allow a macroprudential regulator based in Frankfurt to coordinate liquidity operations with the ECB (and perhaps others) and the same bodies to coordinate fiscal affairs when needed with the European Commission.

There are other ways to align default incentives between the sphere of fiscal responsibility in a financial crisis and the macroprudential regulator. The obvious one would be to abandon the Monetary Union, the Single Market in Financial Services and the dream of a European Fiscal Authority. It would also be possible to step back from the Single Market in Financial Services and restrict banks to operations within the fiscal area that has responsibility to bail them out without abandoning EMU. This may have costs in terms of marginally higher borrowing costs, but it may improve the efficiency of macroprudential regulation sufficiently for these costs to be worth bearing. Liquidity provision would still remain with the relevant monetary authority, but this is the minor part of dealing with a crisis, and the ECB seems competent. However, this change would have to be accompanied by a change in what might be called product regulation, with the Euro Area-wide regulators (or equivalent) ensuring that government debt from outside the country attracts a higher risk weight than own country debt. This would reverse the internationalisation of government debt holding in the Area, and would act like a tax on foreign bond holdings. The reversal of the current structure would be wise, as the associated change in incentives has significantly raised the level of risk in the system. There is a strong case to be made that the gains from the increase in risk sharing from the creation of the Single Market in Financial Services has been overwhelmed by losses from the increase in risk the faulty architecture has generated.

## **US Fiscal Problems and Net national Saving**

The US has rapidly growing government debt and also significant implicit government obligations. As Auerbach notes, if the difference between long term interest rates and the long term growth rate is around one percentage point and the debt stock is around 100 per cent of GDP then a primary surplus of one per cent of GDP is required just to keep the debt stock constant as a percent of GDP. With current US tax rates and spending projections based on a 1 ½ percent of GDP reduction in spending by 2014 NIGEM projections would suggest that gross public sector debt (including state and local government) would rise to 145 per cent of GDP by 2040, and the overall government deficit would be 8.9 per cent of GDP (with a primary deficit of 1.8 per cent of GDP)<sup>20</sup> A combination of economic recovery and direct tax increases of around 4 per cent of nominal GDP by 2040 that are designed to stabilise the debt stock would mean that the deficit overall would settle at around 4 per cent of GDP and the gross debt stock would settle just under 100 per cent of GDP. Auerbach calculates that the fiscal gap induced by pension and social security commitments would be around twice this size, and clearly something needs to be done soon to address the fiscal gap.

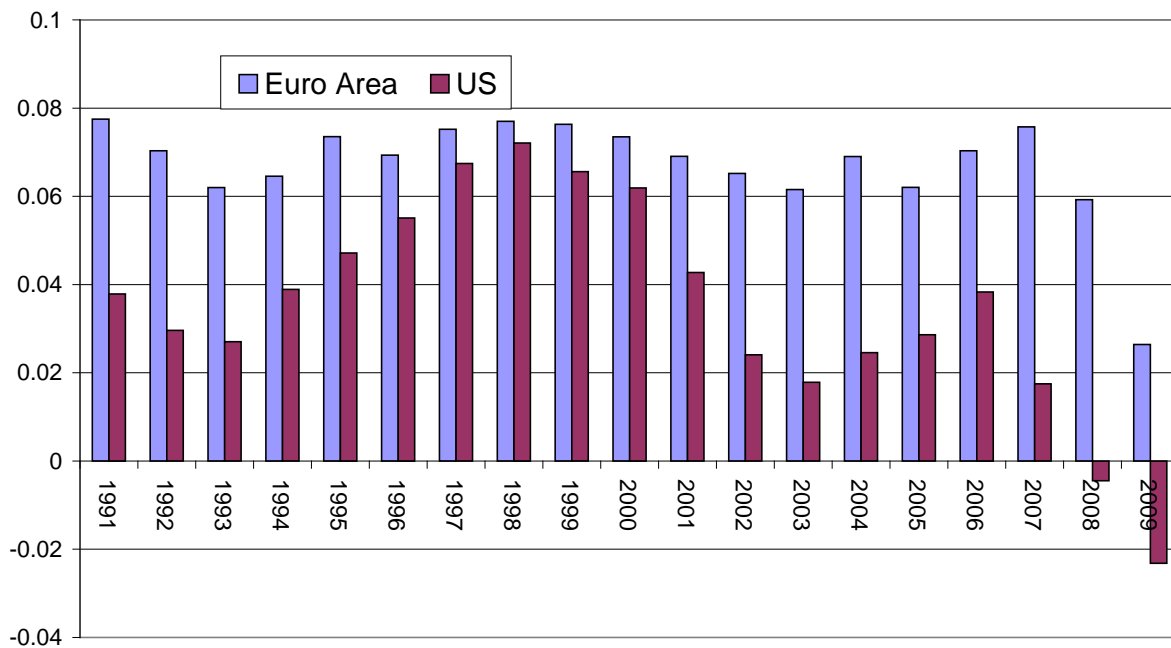
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<sup>20</sup> See National Institute Economic Review July 2011 for details. The uncorrected deficit would be 6.5 per cent of GDP in 2020 and 7.9 in 2030 with the increases resulting from higher interest payments.

The existence of a fiscal gap reflects in part a lack of national saving, and its importance is diminished if national saving outside the public sector is high. A higher level of national wealth means that provision has been made for the future, and a high level of national saving means provision is being made for the future by current members of society. If pension commitments (the major future need) are made by the state, then the state needs to save in order to build up assets, or it has to plan to raise taxes in the future if it wishes to honour its commitments without saving more now. When national saving is high there may be less pressure raise taxes to stop pensioner poverty in the future (as it is less likely) and it is perhaps easier to renege on commitments, as the UK government did in the early 1980s when it changed the uprating of pensions from earnings to prices. Barrell and Weale (2010) argue that high levels of national saving can compensate for low levels of government saving, and they show that for every one percentage point of GDP increase in net government saving in the OECD national saving rises by half a per cent. As we can see from figure two, national saving in the US (gross investment less depreciation and the current account of the balance of payments) has been lower than that in the Euro Area for all of the last two decades, and has reached very low levels.

Figure 2  
**Net National Saving (proportion GNP)**

Gross investment less depreciation plus the current account



Source OECD Net National Saving and authors own calculations for Spain, Greece, Portugal and Ireland.

If net national savings averages 2 ½ per cent of income and trend real growth is also 2 ½ per cent of GDP then real national reproducible wealth will settle in the long run at around 100

per cent of GDP<sup>21</sup>. It is unlikely that this would be enough to ensure income were available for the thirty percent of the adult population who will be above retirement age by the 2030s, having doubled since 2010. The shortfall in saving in the last decade was in part because the household sector did not save much as they treated increases in house prices (or rather in the price of land under the house) as increases in wealth. This is not wise for an individual as it involves transferring wealth from children to parents, as Barrell and Weale (2010) show, and it is not wise in aggregate.

Low levels of national saving would not be worrying if working lives were being extended in line with life expectancy, but in the US between 1989 and 2009 average retirement ages for men and women taken together did not rise whilst life expectancy after pensionable age rose by one year (and rather more for men). As life expectancy after retirement age is expected to rise by up to half a year a decade over the next four decades, and pension related normal retirement ages will rise by only one year in the 2020s, savings needs will rise<sup>22</sup>. However, as with pension commitments by the state, there are other ways to overcome a saving shortfall, as Barrell, Kirby and Orazgani (2011) discuss for the UK, and Barrell Hurst and Kirby (2009) discuss for the Euro Area. If the state has a fiscal gap then it can raise taxes, reduce pension replacement rates or reduce the number of pensioners. If the nation or the individual has too little saving it can reduce consumption and increase saving or it can reduce the length of retirement and hence the need for saving. The latter course raises consumption of goods at all points, and reduces the consumption of leisure in the latter part of life.

We can follow our previous studies and investigate the impacts of changing retirement ages. We undertake an analysis for the US on its own of a progressive increase in retirement ages that is designed to keep the ratio of the population of working age (i.e. below retirement) constant as a proportion of the total adult population<sup>23</sup>. Unlike most other countries, the US pension scheme is designed to be actuarially fair, in that a person who retires one year later has their pension entitlement uprated<sup>24</sup>. Hence we can undertake two alternative evaluations of extending working lives, one where the actuarial value is maintained, and one where the replacement rate is maintained. The improvement in the public finances generated by the former is smaller, and comes from increased tax receipts from higher levels of output and consumption. We follow Barrell, Kirby and Orazgani (2011) and Barrell Hurst and Kirby (2009), and use the NiGEM model to analyse extending working lives in the US under these assumptions. The relevant details of the model are set out in those papers. It is a large multi-country structural model, with properties than in this exercise are very similar to those of DSGE models. Individuals receive income and consume, and can be described as Blanchard Yaari consumers who have a probability of dying and a probability of transiting to retirement. Increasing working lives involves a reduction in this transition probability. We assume consumers are forward looking but have a myopia premium in excess of the risk free rate. Firms have a CES production function along the lines of Barrell and Pain (1997), and factor demands, and investment decisions depend on anticipated equilibrium output. The labour market is closed by a bargaining based real wage equation where wages rise in relation to

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<sup>21</sup> We assume revaluations are in line with the GDP deflator. In the US accounts they seem to have been higher than this and in particular they seem to have taken in some increases in land values as increases in reproducible wealth.

<sup>22</sup> See OECD Pensions at a Glance 2011 and the OECD website for 'Ageing and Employment Policies - Statistics on average effective age of retirement'.

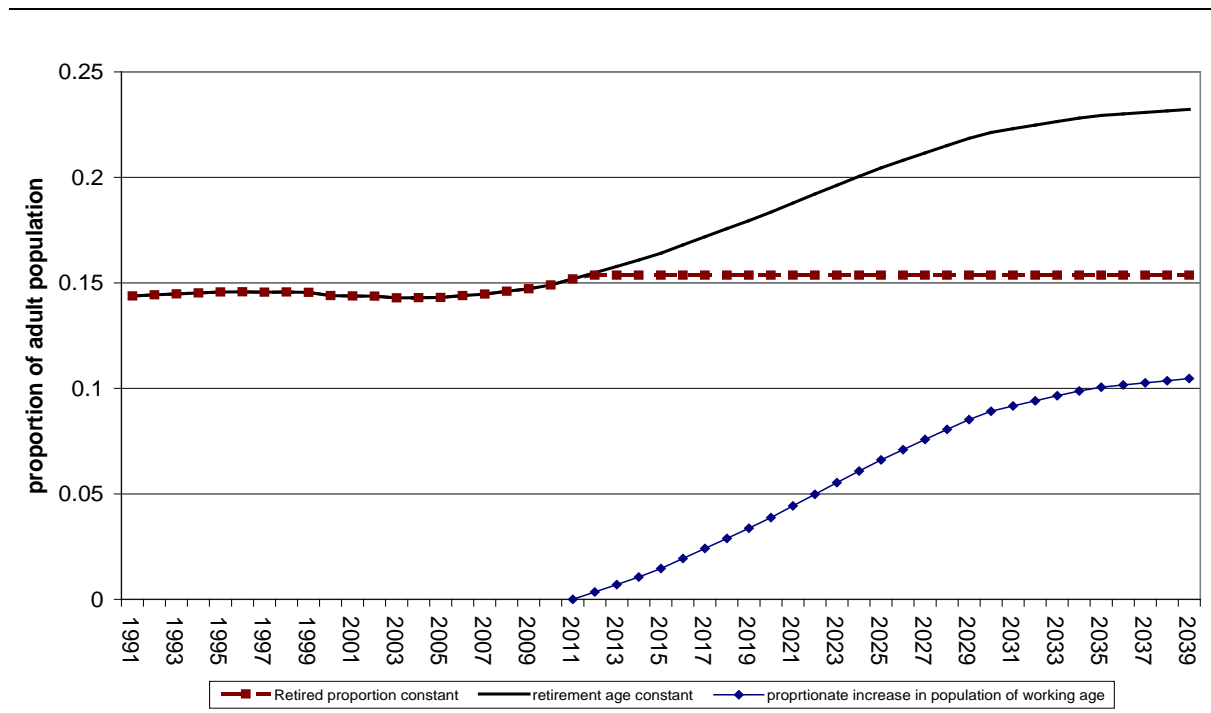
<sup>23</sup> This is not the same as keeping the ratio of working lives to total adult lives constant, as is currently proposed by the US Fiscal Commission). However, healthy retirement accounts for the first 14 of the 17 retired years the average US citizen takes. Hence there are a lot of healthy and experienced workers who can produce more and consume more (and pay more taxes).

<sup>24</sup> I would like to thank Peter Diamond for reminding me of this point.



productivity, depend on factor shares and are influenced by departures from equilibrium unemployment. The economies are open and trade with each other, and there are gross international financial assets and liabilities. The model is stock flow consistent. Financial markets are forward looking. Governments tax and spend, and the monetary authorities have an interest rate feedback rule to stabilise inflation<sup>25</sup>.

Figure 3  
**Extending working lives in the US**  
 NiGEM assumption on population of working age



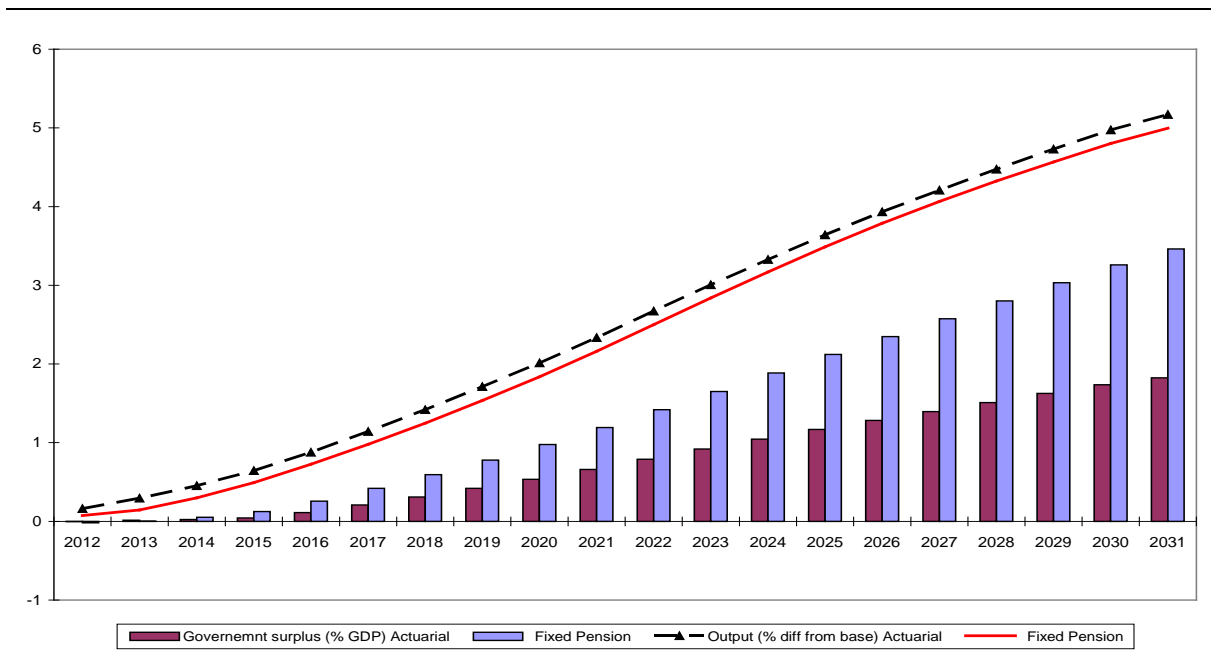
There are many policy alternatives we could analyse. It is easy in a model of this sort to raise the effective retirement age progressively by one more year each decade than is currently planned (one year is planned between 2020 and 2030 in the USA) raising overall retirement ages by around four years by 2040. In Figure 3 we plot the assumption on the proportion of the adult population who are retired and the proportionate increase in the population of working age in the figure. We assume participation rates remain constant, and that the labour force rises in line with the increase in the population of working age, requiring that working lives are extended by almost four years (or almost 3 years longer than currently legislated), which is marginally shorter than the increase in expected retirement between 1983 and 2050. The labour market equations are estimated, and suggest that the US returns to equilibrium unemployment relatively quickly, and hence all the new workers are absorbed. As the policy is introduced in the model with no preannouncement the capital stock takes time to catch up. There is initially an investment boom and forward looking consumers are aware they need to save less for retirement and hence consume more now. We assume income tax and indirect tax rates do not change, and nor do non-retirement benefit rates. Government investment increases with output, but government consumption is assumed to stay as was planned.

<sup>25</sup> The model exists only because it has a user community who pay for it, and these include the IMF, the ECB, the OECD, the Bank of England, and a large number of other policy and research institutions.

There is a significant increase in government revenues, and given our other assumptions the debt stock falls as compared to baseline, and hence interest payments on that debt also fall. We plot the effects on output (on the assumption that those near retirement have a productivity  $\frac{3}{4}$  that of the average member of the workforce) and the change in the general government deficit as a per cent of GDP in two scenarios, one where the actuarial value of pensions is maintained and the other where the commitment is reneged on.

We discuss the policy in depth up until 2030 as the demographic change after that date is less problematic and hence the budgetary situation may begin to improve. If the authorities decide to spread the burden of adjustment and remove the promise to be actuarially sound the improvement in the deficit of 3.9 per cent of GDP in 2030 would be sufficient to stabilise the deficit and the debt stock (at around 100 per cent of GDP). If the promise to be actuarially sound were to be maintained, the impact would be about half the size, and there would need to be an increase in taxes (or cut in spending) of a further 2 per cent of GDP. In both cases aggregate consumption is higher, by around 3 per cent in 2030 if the actuarial promise is broken and by 3  $\frac{1}{2}$  per cent if it is not. Even in the low tax US half of the gains to the budget come from higher tax receipts because of higher incomes and higher consumption, and from the subsequent interest savings from debt reduction, with the debt stock being 25 percent of GDP lower than it would otherwise have been by 2032 in the scenario where pensioners pay and 15 per cent lower where they do not.

Figure 4  
Impacts of Extending Working Lives in the US



The actuarial contract implies a transfer between generations that increases consumption in the short run, but over the next century would lead to progressively lower national income than would have been seen if the contract had been broken. As the population is the same size, on average all consumers are better off if working lives are extended. If the actuarial promise is kept then the retired, who generally had not saved enough will benefit more than

they otherwise would<sup>26</sup>. The other features of the impacts, such as the lack of effect on unemployment and the impacts on investment and the current account are more fully discussed in Barrell, Kirby and Orazgani (2011), although the results would differ marginally for the larger US economy as it will have more impact on global real interest rates than would the UK.

There are of course other ways to close the fiscal gap, but raising retirement ages is the only way to combine that closure with increased consumption of goods and services (but not leisure) for the whole population. Increasing taxes may distort labour markets, and reducing spending on non-retirement items may reduce welfare. Increasing working lives is clearly an important part of any solution to the fiscal problem the US faces. Reducing the scale of intergenerational transfer by removing the actuarial guarantee may also be wise.

## Extending Working Lives in the OECD

We can repeat the US exercise for 18 OECD countries (those where we have the complete models needed to do this), and in each case we assume replacement rates for benefits and pensions as well as tax rates are held constant for the first 20 years of the scenario<sup>27</sup>. Figure 5 below decomposes the aging problem, plotting the decrease between 2012 and 2032 in the proportion of the adult population who will be of working age, where this is defined as the current retirement age. As we note below, the UK (more than two years) and the US (one year), Australia (over one year) Denmark (two years) have increased retirement ages to above 65 in this period and France, Italy, Japan, and Greece have increased the planned retirement age, albeit to 65 or below. A number of other countries are considering such legislation. As OECD (2011) page 23 shows, retirement ages vary. Under current plans they are above 65 for men only in the US, Iceland and Norway, and they will rise above 65 in the UK within a decade. Given expected retirement lengths are rising in all countries we consider here between 2010 and 2050 (except the UK where an increase to 68 absorbs the increase in male life expectancy, and Italy where retirement ages may shorten) the case for extending working lives is strong. On average in the OECD the expected length of male retirement has risen 3 ½ years since 1983, and will rise by a further 1.8 years before 2050, even given current legislation. We also plot the increase in the number of years of working lives that would be needed to stabilise the ratio of those of working age to the total adult population. In all these countries except Greece and Japan the increase in years required is less than the increase in male retirement length between 1983 and 2050.

Our assumptions in this exercise are relatively standard, and the results are similar to those with large DSGE models. Consumers and firms hold rational expectations and look forward, but consumers use a higher discount rate than the government as they have a myopia premium which is higher in countries where consumers are more likely to be borrowing constrained. Labour markets outcomes are based on bargaining equations with forward looking expectations and labour demand curves. Financial markets are fully forward looking. Although there is inertia in the model it is not of relevance to our discussion as the equilibrium path is attained in five years after the announcement of the plan to increase working lives to stabilise the proportion of the adult population who are above working age. Unemployment will initially rise marginally, and it is absorbed (in the model at least) more quickly in the US than elsewhere.

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<sup>26</sup> Barrell and Weale (2010) describe the people who will retire over the next 30 years in the UK and the US as the 'profligate generation' who did not save for their future, perhaps because of promises from governments.

<sup>27</sup> If all rates are constant then there is a possibility that the debt stock could implode, and hence to prevent this reverse Ponzi game we have to target the deficit at some point.

Figure 5

**Decomposing responses to the aging problem in the OECD**

Notes - before UK changes post 2020

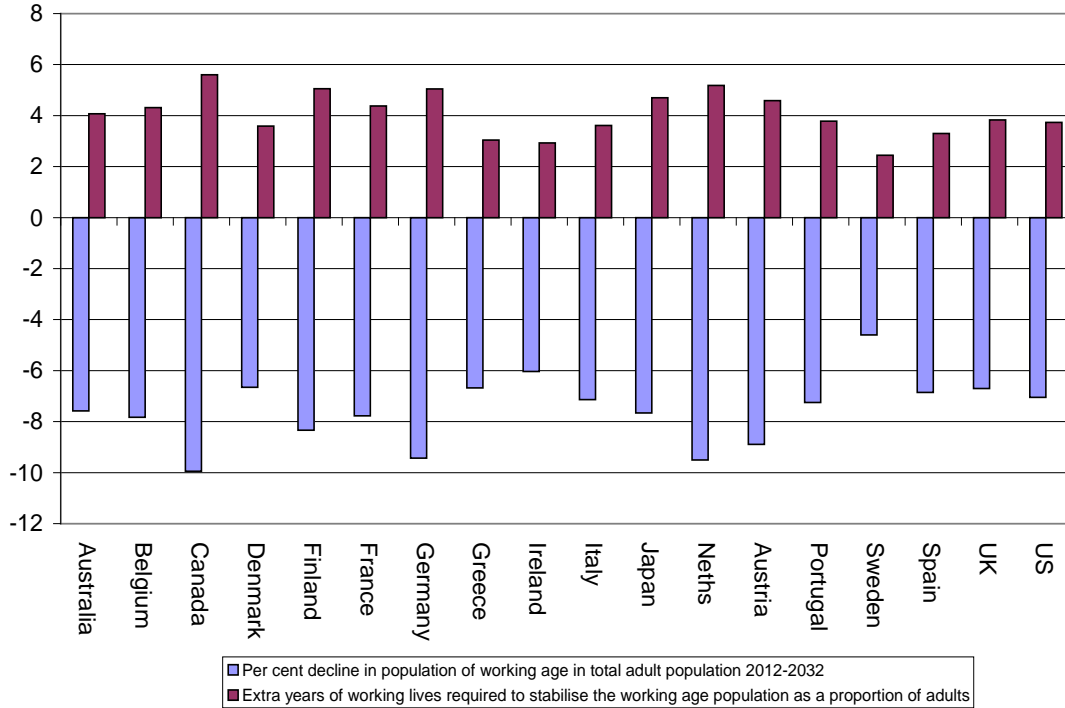
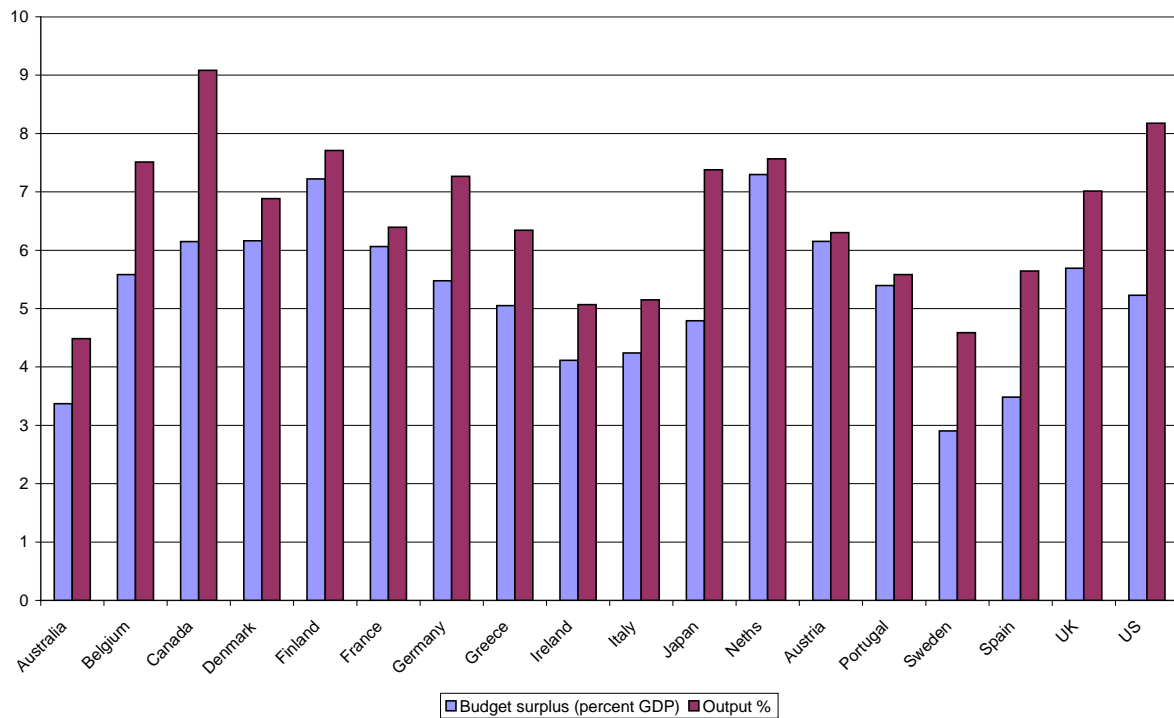


Figure six plots the impact on output and the level of the public sector deficit as a per cent of GDP. The baseline reflects increases in retirement ages that have already been implemented or will be by 2018, but not the increases that are currently planned by 2030 in the US, the UK or all of the Greek increase in retirement ages, as the latter was uncertain at the time of writing. The improvements in the budget deficit we project from stabilising the proportion of the adult population who are retired depend upon tax structure and on the generosity of benefits, but the correlation with the gross replacement ratio for average men is around 0.5. Over the 20 year horizon around half the improvement in the budget comes from lower benefit payments, whilst the rest reflects higher tax receipts and lower government interest payments. As Barrell, Kirby and Orazgani (2011) show, over the medium term these become increasingly important. The figure also plots the average increase in years worked that are needed, along with the percentage increase in the working age population.

Auerbach stresses the importance of fiscal gaps (under unchanged policies) and reports on those in all 18 countries here. By 2060 the fiscal gap over the previous five decades have averaged over 5 per cent of GDP in Austria, Greece, Japan, the Netherlands, Portugal, the UK and the US, and close to that level in France, Ireland and Spain. Stabilising the retired population as a proportion of the adult population by 2030 and keeping tax rates constant thereafter would remove much of the fiscal gap in France and Austria, and leave gaps in Ireland, the UK and the US that were manageable at 1 per cent of GDP or a little more. Such gaps could be closed by further expansion of working lives, or by relatively minor increases in tax rates or reductions in spending on benefits or on goods and services.

Figure 6

**Impacts of holding retired constant as a proportion of adults**



Differences from NIESR baseline

Spain, Portugal and Greece would have significant problems closing the remaining gap, which might be as much as 10 per cent of GDP in the last case, and 2 to 3 per cent of GDP in the other two cases. Japan may also face a need to tighten fiscal policy further by up to 3 per cent of GDP, but this is less worrying for the markets than are the other countries with problems as much of Japanese public debt is held at home. Spain and Greece have relatively generous replacement rates from the public sector for retired people, with gross replacement rates of 82.1 and 95.7 respectively, as compared to 42.1 for the OECD on average (see OECD 2011 for details of replacement rates). There is no tapering of replacement rates for those above average incomes in these countries. Hence reductions in pension generosity along with significant increases in working lives may be necessary in both. The Greeks have had a retirement age of 55 which is being raised to 60 over the next decade. Greece currently has the longest expected retirement of those countries considered here, although by 2020 that will no longer be the case according to OECD projections, and France and Belgium may have marginally longer retirements by 2050. However, these countries do not face significant fiscal gaps in the same way. However, given that net national saving has been negative in Greece since 2006 (since 2003 in Portugal) perhaps more needs to be done, and cuts in expenditure may be inevitable to help increase net national saving which is mainly for retirement.

**Conclusions**

The inability to control the growth of explicit government debt in the last three decades did not cause the financial crises we saw in 2007 and 2008, and Barrell, Davies, Karim and Liadze (2010) show that they were not a contributory cause (in a statistical way). However,

worries about the emission of debt cannot be ignored, and the scale of cross border holdings of sovereign debt, and overall level of that debt, independent of where it is held, have caused enormous problems for the authorities in the Euro Area in 2011. Although the USA and many countries in Europe appear to have significant levels of spare capacity it is clearly important to have fiscal consolidation plans in place. Christodoulakis (2011) blames the delay in introducing such a plan for many of Greece's current problems. However, rapid consolidation can also be a problem, as Barrell (2011) discusses for the UK. Plans need to be in place, and perhaps the most attractive is to extend working lives, as forward looking consumers and firms might increase spending now, reducing the output gap, and they will pay more taxes and absorb fewer benefits in future reducing fiscal pressures.

The longer term fiscal problems faced by advanced economies are more related to implicit debts, as existing government spending commitments along with announced tax rates, state pensions and retirement ages will leave increasingly large gaps and deficits will increase. Auerbach calculates these fiscal gaps, and in this note we comment that much of the problem could be solved by raising the age of retirement less than in line with increases in expected retirement lengths. The alternatives are reneging on pension commitments or increasing (distorting) taxes. Extending working lives increases consumption of goods and services, but reduces that of leisure. Our calculations suggest that only Spain, Portugal and Greece would have significant problems in excess of this policy, and expensive retirement systems would have to change or taxes would have to rise.

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