



Fiscal Consolidation and the Implications of Social Spending for Long-Term Fiscal Sustainability

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Abstract: this paper sheds light on the scale of fiscal consolidation that will be needed to ensure long-term sustainability and on the potential benefits of institutional reforms in mitigating budget pressures of social spending. Based on alternative scenarios, results suggest that, in several OECD countries, the fiscal challenges are exacerbated in the long term by spending pressures related to health and pensions. This paper shows how institutional reforms may support long-term fiscal sustainability and, at the same time, reduce adverse short-term effects of fiscal consolidation on growth.

JEL classification: E62; H50; H68; J11

Keywords: fiscal consolidation; long-term public finance sustainability; public social expenditure; long-term projections; ageing populations

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1 Introduction

Demographic developments over the future decades, due to low fertility rates, continuous increases in life expectancy and the retirement of baby-boom generation, will induce a substantial “greying” of the population in OECD countries. Moreover, trends in social spending pose additional challenges to sustainability of fiscal balances. Health, long-term care and pensions will drive up public spending in almost all OECD countries over the horizon 2010-2050. With population ageing and projections of increasing pension and health spending, fiscal consolidation becomes more urgent in order to mitigate the economic and budgetary consequences of age-related spending.

These developments, combined with a post-crisis growth slowdown, will put increasing pressure on fiscal sustainability. During the economic and financial crisis, fiscal positions across the OECD countries have deteriorated sharply. In most countries, budget deficits soared as a result of the economic slump and the policy response to the crisis, namely the stimulus packages and support for troubled financial institutions. Current fiscal positions became unsustainable in most countries with underlying balances often very weak and debt rising rapidly.

The fiscal implications of ageing population have been widely discussed (e.g. Dang et al., 2001; Andersen, 2012; Fehr et al., 2008; Auerbach, 2012). One angle that is unappreciated in the literature is the interaction between increasing spending on health and pensions, the post-crisis growth slowdown and ongoing fiscal rebalancing efforts. This paper contributes to the existing literature by analyzing the interaction of these factors.

The aim of this paper is twofold. First, it assesses the scale of fiscal consolidation across the OECD countries needed to ensure long-term sustainability by 2050. The analysis emphasizes the implications of ageing populations and other spending pressures on public budgets. Second, it assesses to what extent institutional reforms can mitigate these budget pressures and hence contribute to fiscal consolidation. In particular, the paper focuses on the role of institutions in reducing the debt burden by reforming health and pension system.

Simulation results are summarized in the so-called fiscal gap indicators, as initially proposed by Blanchard (1993) and Auerbach (1994), to provide a simple metric for how much consolidation is needed under a series of different scenarios.¹ Long-term simulations are run based on a simple country-specific model set-up built on the medium-term baseline projections presented in the Economic Outlook (OECD, 2011a). Several scenarios are modelled, so to recognize the upward risks to the baseline projection posed by the uncertainty surrounding long-term projections. In order to isolate the

¹ For a discussion on alternative measures proposed in the empirical literature to gauge sustainability in the face of ageing, see Langenus (2006).

effect of pension and health spending pressures, in the baseline scenario these expenditure items are assumed to remain a constant share of GDP. In a second set of scenarios, pension spending and health spending are phased in one by one, according to the projections provided by the European Commission, the OECD and the U.S. Congressional Budget Office. Finally, the last two scenarios simulate the potential benefits of institutional reforms in the pension system or health care.

The paper states four main results. First, large differences in fiscal consolidation needs arise across OECD countries largely due to differences in underlying deficits at the starting point and to some extent the level of initial debt. Second, the various scenarios suggest that in several OECD countries, the fiscal challenges are exacerbated in the long term by spending pressures related to pension, health care and long-term care. Third, against this backdrop, institutional reforms of the pension system can contribute to fiscal consolidation. For example, increasing the retirement age can boost labour utilisation, while at the same time mitigating the budget pressures resulting from ageing populations. Fourth, moving to best practice in public sector institutions, by improving the provision of health services, can enhance efficiency and reduce spending pressures.

The paper is organised as follows. Section 2 describes the model and the baseline assumptions underlying the long-run projections and then presents the methodology for computing the fiscal gaps. Section 3 presents simulations assessing the implications for fiscal sustainability of pension and health spending. Section 4 presents simulations gauging the effects of institutional reforms. Section 5 summarises the main conclusions. Finally, an appendix provides some additional simulations assessing the implications of setting more ambitious debt targets.

2 Model Description

2.1 *Basic Structure and Data*

The empirical literature has proposed two main approaches to assess fiscal sustainability, as described in Langenus (2006). A first approach assesses fiscal sustainability by testing the cointegration between government revenues and expenditure (e.g. Claeys, 2007; Afonso and Rault, 2010), or by testing for a positive relationship between the primary surplus and the initial public debt ratio (e.g. Bohn, 2005 and Marinheiro, 2005). A second approach incorporates the future values of the determinant of debt and develops measures of the fiscal adjustment needed to restore sustainability. Within this approach, models have developed in three directions: generational accounting, DSGE models with overlapping generations and macroeconomic models. On the one hand, the first two methodologies have

received large attention as they allow to link sustainability with intergenerational fairness considerations. On the other hand, macroeconomic models remain largely used especially in institutions – in spite of the critique of not being robust to changes in policy regime – due to their ability to transform complex simulation results into synthetic indicators which can be easily interpreted. Compared to general equilibrium models, where even small changes in model structure often require re-specification of the entire model, macro-econometric models remain more flexible and allow modellers to accommodate specific scenario requests more easily, as they rests on a partial equilibrium approach where each individual block of the model can be specified and estimated independently. Therefore, macro-econometric models easily allow phasing in developments in population structure, due to migration and changes in fertility and longevity.

The analysis in this paper is based on a macroeconomic model.² A simple country-specific model set-up is built based on the medium-term baseline projections presented in the Economic Outlook (OECD, 2011a), which go up to 2025.³ The advantage of using the medium-term baseline is that it provides a path for output to return to potential and a normalisation of interest rates in the long-run.

This paper relates to the European Commission's Sustainability Report (2009a), but it complements the analysis in three dimensions. First, it provides a common framework for both European and non-European countries. Second, a more complete set of scenarios examines institutional arrangements that might support fiscal consolidation. Third, the model framework presents some extensions that help describing more realistically some economic features. In particular, the model is based on an explicit modelling framework for interest rates, which play an important role for the debt dynamics. The model in this paper assumes that there is a link between debt level and interest rates, which operates through the risk premium: the decrease in government debt burden diminishes the risk premium associated with public debt issuance, contributes to reduce real interest rates on the existing debt and finally feeds-back in lower debt. This mechanism provides further support to fiscal consolidation, which is lacking in the European Commission's analysis.

The basic structure of the model consists of four blocks: (i) the supply-side block; (ii) the government social spending block; (iii) the government fiscal balance block and (iv) the interest rates block. Concerning the supply-side block, historically, cross country gaps in productivity have accounted for the bulk of cross-country differences in GDP per capita (e.g. Easterly and Levine, 2001; Duval and de la Maisonneuve, 2010). However, in the long-

² The analysis is not based on any intergenerational equity criterion, and therefore differs also from the generational approach adopted in other works (e.g. Langenus, 2006; Balassone et al., 2009).

³ Due to lack of data, Chile, Estonia, Mexico, Israel, Slovenia and Turkey are not included in this analysis. Data for pension spending are not available for Iceland.

run, all countries converge at the worldwide rate of productivity, with some catch-up allowed for initially low-productivity countries. The Economic Outlook's medium-term baseline has labour productivity growth slowly converging from 2015 to 2025, ending up ranging from 1.4 in Denmark to 2.4 in the Slovak Republic. Between 2025 and 2035 labour productivity converges to 1.75% for all countries. Although in the long-run all countries converge at the worldwide rate of productivity, cross-country GDP gaps remain, mainly reflecting differences in labour force growth, which encompasses differences in human capital and population. Hence, we assume that GDP evolves according to:

$$GDP_t = GDP_{t-1} \cdot \left(1 + \frac{PROD_t}{100} \cdot LFG_t \cdot INFL_t\right) \quad (1)$$

where $PROD_t$ is the labour productivity growth and $INFL_t$ is the inflation rate, which in the long-run converges to the monetary authorities' target, typically 2% annually. Labour force growth LFG_t encompasses developments in human capital, namely labour force participation rates and employment rates. Accordingly, labour force growth can be decomposed into developments in the underlying demographics (e.g. working age population), labour force participation and employment:

$$LFG_t = 1 + d \log \frac{LFPR_t}{100} \cdot ER_t \cdot WP_t \quad (2)$$

where $LFPR_t$ is labour force participation rate and ER_t is the employment rate. Labour force participation rates and employment rates are taken from the Economic Outlook's medium-term baseline till 2025. From 2025 onwards, participation rates and employment rates are assumed to remain constant. Finally, the third component of labour force growth is the working age population WP_t , which evolves consistently with population cohort developments.⁴ The data on population developments are taken from the United Nations population cohort-based projections (2008 revisions), assuming that migration continues at past rates. As retirement age is set at 65 years old, the working age population is defined as population between 25 and 64 years old.

Concerning government spending, the model set-up explicitly considers additional pressures on budgets arising from ageing-related spending. Spending paths for pensions, health and long-term care are derived from OECD, EU and national sources and are reported in Table 1. Long-term projections suggest that, in the absence of policy action, the average change in health spending by 2050 is 2.2% of GDP. These projected trends in public health are likely to be a source of concern for most OECD governments. Pension spending is expected to go on growing in 24 out of 26 OECD countries

⁴ The cohort approach consists in calculating cohort-specific entry and exit rates into or out of the labour force by tracking the participation rates of a given cohort over the time. For more details, see Burniaux et al. (2004).

where data are available. On average, albeit with considerable variation across individual countries, pension expenditure is projected to grow by 2.8% of GDP over the horizon 2010-2050. While health spending increases do not vary much across the OECD countries, forecasts on pension spending are much more heterogeneous: the estimated increase in pension spending ranges between negative values in Poland and Sweden and values above 12% of GDP in Luxembourg and Greece (before recent reforms), followed by Spain, Korea and Ireland.

The data for the pension spending projections for the EU countries are taken from the European Commission's Sustainability Report (2009a); the data for other countries are mainly taken from Pensions at a Glance (OECD, 2011b), while the figures for the United States come from Congressional Budget Office (2010). These data provide spending paths for the baseline projections and can be altered to assess effects of reforms since the estimates were done. In the model set-up, the path of pension spending ($Pens$) over the horizon 2012-2050 is phased in so that the profile of spending follows the profile of changes in pension spending and in the old-age dependency ratio:

$$Pens_t = Pens_{t-1} \cdot \left(\frac{GDP_t}{GDP_{t-1}} \right) + \left(\frac{OADR_t - OADR_{2020}}{OADR_t - OADR_{2050}} \right) \cdot (1 + \Delta Pens) \cdot GDP_t \quad (3)$$

where $OADR$ is the old age dependency ratio and $\Delta Pens$ is the change in pension spending over the horizon 2012-2050 according to the European Commission and OECD projections. Equation (3) states that pension spending is driven by two factors. The first factor is the path of current GDP and projected increases in pension spending. The second factor is the evolution of demographics over the horizon 2012-2050. Old age dependency ratios reported in Table 1 prove that over the horizon 2012-2050 many OECD countries will experience a substantial "greying" of the working age population.

For health and long-term care spending, following Oliveira-Martins and de la Maisonnette (2006) and Dormont et al. (2006), we assume that only a portion of the projected increase is ageing related.⁵ The change in spending is phased in linearly (as a per cent of GDP) over the projection horizon to meet projections for spending as a share of GDP in both 2025 and 2050.

Various assumptions about pension, health and long-term care spending can be used to examine the sensitivity of fiscal positions to such spending pressures. In order to isolate the effect of these spending pressures, in the baseline scenario spending on pensions, health and long-term care are assumed to remain a constant share of GDP. In addition, alternative scenarios show the effect of rising pensions and health spending.

We assume that from 2025 onwards, both revenues and spending on education and other generic items will grow in line with GDP,⁶ with the au-

⁵ Using microdata over the sample 1992-2000, Dormont et al. (2006) show that ageing explains only a small part of the rise in the health care spending in France, while changes in practices is by far the most important driver.

⁶ Assuming that social spending are evolving proportionally to GDP implies that expen-

automatic stabilisers operating while the economy moves back to potential. Total spending is the sum of spending on pensions, health, education and other generic non age-related items. Net government debt ($Debt_t^{net}$) evolves according to:

$$\frac{Debt_t^{net}}{GDP_t} = \frac{Debt_{t-1}^{net}}{GDP_{t-1}} + \left(\frac{Exp_t}{GDP_t} - \frac{Rev_t}{GDP_t} \right) \cdot (1 + R_t) \cdot \frac{Debt_{t-1}^{net}}{GDP_{t-1}} \quad (4)$$

where Exp_t/GDP_t and Rev_t/GDP_t are respectively total expenditure and total revenues as ratio of GDP, and their difference determines the primary deficit-to-GDP ratio ($Exp_t/GDP_t - Rev_t/GDP_t$). The last term on the right-hand side represents interest payments on the outstanding debt. Equation (4) implies that the primary deficit finances new debt net of interest payments on the outstanding debt. Gross debt ($Debt_t$) is determined by adding financial assets to the net debt:

$$\frac{Debt_t}{GDP_t} = \frac{Debt_t^{net}}{GDP_t} + FA_t \quad (5)$$

where FA_t are financial assets.

An important feature of this model is that the interest rate is endogenous. The implicit interest rate paid on the previous period's debt displays a certain degree of inertia and for the rest adjusts gradually to a weighted average of the short-term interest rate and the long-term interest rate (Johansson et al., 2013):

$$R_t = 0.9 \cdot R_{t-1} + 0.1 \cdot (0.75 \cdot R_t^S + 0.25 \cdot R_t^L) \quad (6)$$

where R_t^S is the short-term interest rate and R_t^L is the long-term interest rate.⁷

We assume that rising debt levels increases government debt exposure to higher interest rates. Therefore, in this set-up the long-term rate includes a premium over the risk-free interest rate of 4 basis points for each percentage point of debt in excess of 75% of GDP⁸ (Laubach, 2003 and Égert, 2010):

$$R_t^L = R_t^{RF} + 0.04 \cdot \left(\frac{Debt_t}{GDP_t} - 0.75 \right) \quad (7)$$

diture to produce a given level of services evolve proportionally to the general income level in the economy. This assumption may be interpreted as a public service constraint, namely that the provision of service should respect unchanged standards. For a further discussion, see Andersen (2012). The assumption that revenues evolves proportionally to GDP implies that most of government revenues come from taxes on labour and capital income, and on consumption, which increase with national income.

⁷ The choice of these ad-hoc weights for the short-term and long-term interest rates reflects rolling over debt and thus its maturity structure. This represents a convenient assumption that seems to capture implicit interest rate movements for most countries, most of the times (see also Johansson et al., 2013). The speed of this adjustment depends on the share of outstanding debt that is refinanced annually, which is assumed to gradually evolve to a common share of 10% across countries. The interest rate inertia parameter set equal to 0.9 is quite standard in the literature.

⁸ Japan is assumed to remain unusual, with the very high share of domestic financing keeping the risk premium at only 1 basis point for each percentage point of debt in excess of 75% of GDP.

where R_t^{RF} is the risk-free interest rate. The short-term interest rate and the risk-free interest rate are taken from the Economic Outlook's medium-term baseline till 2025. Equation (7) implies that debt overhang increases the perception of default risk, because it calls into question whether debt will be fully re-paid in the future. High levels of debt can finally lead to speculative attack on sovereign debt markets. Some literature (Corsetti and Dedola, 2011; Favero and Missale, 2011; Greenlaw et al., 2013) has pointed out that an increase in the perception of default risk induces investors to demand a higher yield, which in turn makes the default more likely.

While there is a link between interest rates and high debt levels, the model does not include a link between high debt levels and GDP growth. Fiscal policy has consequences for output growth. Policy adjustments to restore sustainability can take a variety of forms, which affect decisions on labour and capital supply. In addition, given the choice of a particular policy instrument, different timing options are available. However, to keep the model set-up tractable, we do not distinguish between policy instruments nor assess their potential feedback on output. In this light, the simulations give an indication of the scale of the problem, but not the potential short-run trade-offs in undertaking fiscal consolidation.

2.2 Methodology: Long-Run Projections and Fiscal Gaps

Consider a model of n equations in which $f = [f_1, \dots, f_n]'$ is a vector function of n endogenous variables $y_t = [y_{1,t}, \dots, y_{n,t}]$. The model does not involve variables with leads and can be described as:

$$f(y_{t-1}, y_t, x_t) = \begin{bmatrix} f_1(y_{t-1}, y_t, x_t) \\ \vdots \\ f_n(y_{t-1}, y_t, x_t) \end{bmatrix} \quad (8)$$

where y_t is a vector of all the endogenous variables, y_{t-1} indicates the vector of lags of endogenous variables and x_t is a vector of all exogenous variables. Therefore, the equations from all periods across which the model is solved must be treated as a dynamic, or time-dependent, simultaneous system.

The model is solved by running a deterministic simulation.⁹ Despite the attention gained by stochastic model literature, deterministic simulations are often used to describe the reaction to a policy change or to a shock until the system returns to the old or to a new equilibrium. For this reason, deterministic simulations are well suited to study the transition path to a new equilibrium that meets a given debt target.

The model is solved iteratively applying the Gauss-Seidel method¹⁰ whi-

⁹ The robustness of results is checked by running also a set of stochastic simulations. Stochastic simulations offer an alternative way to the scenario approach of dealing with uncertainty surrounding the long-term projections. Results are omitted for the sake of space. For details, we refer the reader to Merola and Sutherland (2012).

¹⁰ Alternative methods are Jacobi and Newton's method. These methods, as the Gauss-

Table 1 - Ageing, Pension and Health Care Spending Assumptions

	Old age dependency ratio		Change in pension spending (% GDP)	Change in health (%GDP)				Change in long-term care (%GDP)	
				No-reform scenario		Reform scenario		2005	2026
	2012	2050	2010-2050	2005	2026	2005	2026		
Australia	0.2	0.4	1.6	1.8	2.4	1.5	0.8	0.5	1.5
Austria	0.3	0.6	1.3	1.5	2.3	1.2	0.8	0.6	1.4
Belgium	0.3	0.5	4.4	1.3	2.0	1.0	0.5	0.6	1.3
Canada	0.2	0.5	5.8	1.9	2.2	1.6	0.6	0.6	1.5
Czech Republic	0.2	0.5	3.1	1.7	2.4	1.3	1.0	0.7	1.0
Denmark	0.3	0.4	0.2	1.5	2.0	1.1	0.6	0.4	1.1
Finland	0.3	0.5	2.6	1.8	1.8	1.5	0.3	0.8	1.6
France	0.3	0.5	0.7	1.5	2.0	1.1	0.6	0.4	1.3
Germany	0.3	0.6	2.1	1.5	2.1	1.2	0.6	0.8	1.1
Greece	0.3	0.6	0.0 (12.5 before recent reforms)	1.6	2.3	1.3	0.7	1.3	1.4
Hungary	0.3	0.5	1.9	1.5	2.1	1.2	0.6	0.8	1.3
Ireland	0.2	0.5	5.0	1.6	2.4	1.3	0.9	1.5	2.3
Italy	0.4	0.7	0.7	1.6	2.2	1.2	0.7	1.3	1.6
Japan	0.4	0.9	0.6	1.9	2.4	1.6	0.9	1.1	1.1
Korea	0.2	0.7	8.0	2.1	2.8	1.8	1.2	1.1	2.7
Luxembourg	0.2	0.4	13.5	1.4	2.3	1.0	0.9	1.3	1.8
Netherlands	0.3	0.5	3.8	1.7	2.1	1.4	0.6	0.7	1.3
New Zealand	0.2	0.4	8.0	1.8	2.4	1.5	0.8	0.6	1.4
Poland	0.2	0.6	-1.6	1.8	2.3	1.5	0.8	1.1	2.1
Portugal	0.3	0.6	1.4	1.6	2.6	1.3	1.1	0.6	1.4
Slovak Republic	0.2	0.5	2.8	1.9	2.7	1.5	1.3	0.7	1.6
Spain	0.3	0.7	3.1 (6.6 before recent reforms)	1.6	2.5	1.3	1.0	1.1	1.3
Sweden	0.3	0.5	-0.6	1.4	1.8	1.1	0.3	0.3	0.8
Switzerland	0.3	0.5	2.8	1.6	1.9	1.3	0.3	0.4	1.0
United Kingdom	0.3	0.4	1.4	1.4	2.2	1.1	0.6	0.6	1.3
United States	0.2	0.4	1.4	1.5	1.9	1.2	0.4	0.4	1.3
Average			2.8	1.6	2.2	1.3	0.7	0.8	1.4

Source: United Nations 2008 revision, OECD (2011b), Congressional Budget Office (2010), European Commission (2009b) and OECD estimates of 2010 pension reforms for Greece and Spain. Note: For Australia, Canada, Japan, Korea, New Zealand and the United States, the horizon is 2000-50.

Table 2 - Starting Points for Fiscal Policy, Average Growth and Interest Rates

	Starting point, 2012		Average over simulation	
	Gross debt, %GDP	Underlying primary balance % GDP	Effective interest rate	Nominal GDP growth
Australia	31	0.6	6.9	4.8
Austria	82	0.1	4.4	3.5
Belgium	100	0.9	4.7	3.8
Canada	88	-1.8	4.9	4.2
Czech Republic	51	0.3	4.4	4.2
Denmark	60	0.8	5.0	3.5
Finland	66	0.8	4.2	3.9
France	100	-0.6	4.1	3.6
Germany	87	0.6	4.3	3.0
Greece	159	3.5	5.5	3.4
Hungary	81	1.1	5.8	3.2
Ireland	126	-0.4	4.7	4.3
Italy	128	3.3	4.6	3.1
Japan	219	-4.2	3.0	2.2
Korea	33	0.5	4.9	3.2
Luxembourg	24	2.0	4.5	4.9
Netherlands	75	0.0	4.3	3.5
New Zealand	52	-4.0	5.8	4.3
Poland	66	-1.5	5.3	3.2
Portugal	116	3.5	4.6	3.1
Slovak Republic	51	-1.7	5.1	2.8
Spain	75	0.5	4.2	3.5
Sweden	41	2.6	4.7	4.0
Switzerland	37	1.2	2.9	2.9
United Kingdom	93	-3.0	4.6	4.1
United States	107	-5.8	4.6	4.3

ch implies that only values of the endogenous variables from before the solution sample are used when forming the forecast.

When solving the model, initial and final values have to be set. Simulations start from 2012 and run until 2050,¹¹ implying that the tightening is from 2013 onwards. As some governments are already undertaking fiscal consolidation measures, the starting point already embodies expected fiscal tightening.¹² Starting points are reported in Table 2. The final values are set so that the debt-to-GDP ratio will meet a given target (i.e. 50% of GDP) by 2050.

The long-run projections are used to determine so-called fiscal gaps (Blanchard, 1993 and Auerbach, 1994). The fiscal gap shows the improvement in the underlying primary balance that is required to ensure that debt meets a target at a certain point in time.¹³ The fiscal gaps reported in this paper ensure that gross debt is 50% of GDP in 2050. This is intended to be illustrative and not normative.

3 Results

3.1 *The Baseline Scenario*

In the baseline scenario, pension and health spending grow in line with GDP over the horizon 2012–2050 and the retirement age is set at 65 years. Up to 2025, the projections for output and interest rates are based on the OECD's medium-term baseline projections. Public revenues and primary expenditure are assumed to grow in line with GDP.

The fiscal gap calculations show the size of fiscal consolidation requirements necessary to achieve the 50% of GDP debt target by 2050. The baseline simulations show the tightening of the primary balance in 2012 needed to reach this target. Considerable differences across countries emerge (Figure 1). Countries differ mainly because of large differences in underlying deficits at the starting point and to some extent the level of initial debt. A number of countries (e.g. Switzerland, Korea, Luxembourg and Sweden) do not face any tightening requirements to meet the target. In Italy, even

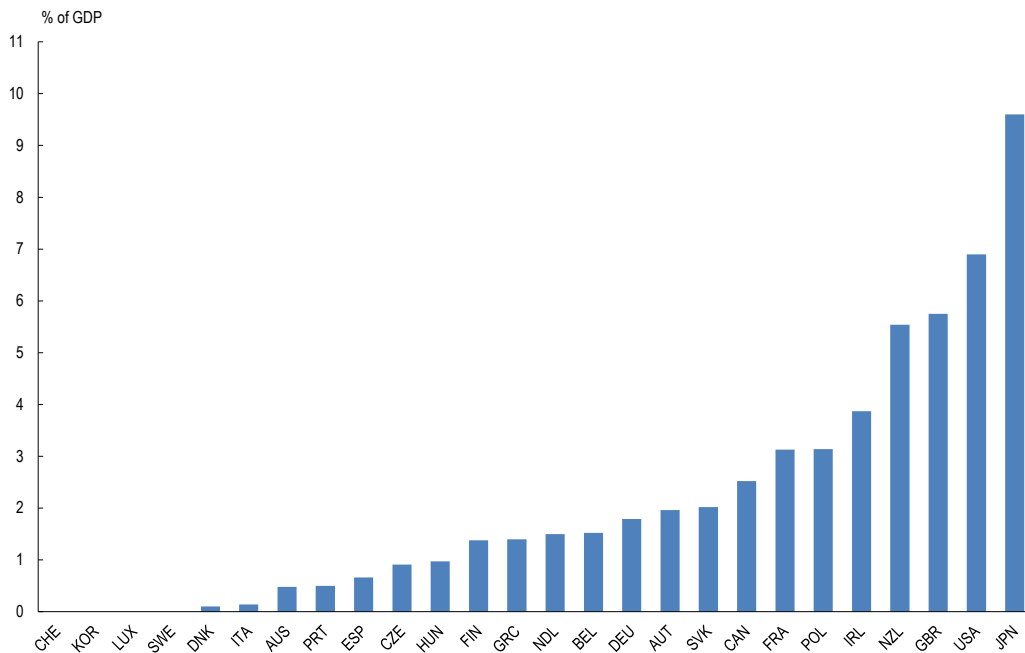
Seidel, solve the model period by period and forwards in time. However, for large models, Gauss-Seidel is preferable.

¹¹ Simulations are run using E-views version 7.2.

¹² In some cases this tightening is substantial. Between the trough (measured by the underlying primary balance) following the onset of the crisis in 2007 and the projected value for 2012, five countries are expected to tighten by more than 5% of GDP (Spain, Greece, Ireland and Portugal), with Greece having a projected underlying primary surplus of 3.5% of GDP in 2012 as compared to a deficit of 8.9% of GDP in 2009.

¹³ The fiscal gap is related to a number of recent sustainability exercises, primarily the European Commission's Sustainability Report (2009a). The European Commission calculates two sustainability indicators based upon the projected ageing costs and the requirement of a 60% of GDP debt ratio by 2050.

Figure 1 - Baseline Fiscal Gaps. Immediate and Permanent Change in the Underlying Primary Balance Needed to Bring debt to 50% of GDP in 2050



Note: The change is with respect to the underlying primary balance in 2012.

though the initial debt level is very high, debt is already on a declining path at the start of the projection.

A relatively small tightening (below 3% of GDP) is still required for the rest of the OECD countries, where a sound budget position has already been achieved in the short term. Countries already undertaking large fiscal consolidations (e.g. Spain, Greece and Portugal) generally face moderate fiscal gaps. Most of the EU countries (e.g. Spain, the Slovak Republic, Poland and France) have targeted a reduction in the overall fiscal deficit to 3% of GDP over the next two to four years. Therefore, the prompt consolidation causes lower interest payments and requires less additional consolidation. In some of these countries, ambitious cuts in public expenditure (e.g. the Slovak Republic), higher taxes (e.g. Spain) or robust growth (e.g. Poland) have supported fiscal consolidation.

Countries where underlying fiscal deficits are expected to remain substantially high in 2012 face much larger fiscal gaps. For example, the fiscal gaps for New Zealand, the United Kingdom the United States, and Japan exceed 5% of GDP.

3.2 The Effect of Pension Spending Pressures

Despite the reforms introduced during the past couple of decades, many OECD countries continue to face looming fiscal pressures related to the ongoing ageing of their populations. On average in the OECD, public pension

spending is projected to increase from 8.4% of GDP in 2010 to 11.4% in 2050 (OECD, 2011b), with substantially larger increases in several countries (Table 1).

The implications of such increases in spending in the absence of reform can be assessed by allowing pension spending to change over the horizon 2012-2050, according to the projections provided by the OECD and the European Commission. To isolate the effects of increasing trends in pension spending, health spending is kept constant.

The simulations do not take into account taxes on private occupational pension schemes, which in some cases could significantly boost revenues. The path of projected public pension spending is phased in so that the spending profile follows the profile of the old-age dependency ratio. Including pension spending alters the fiscal gaps for many countries radically relative to the baseline scenario (Figure 2).

When ageing-related spending is included, debt and debt servicing costs rise in all countries, except in Poland and Sweden. In these two countries, as public pensions drop households need to ensure that their retirement income is supplemented by private saving. In this light, the effects of Poland's recent reforms to the second pillar will need to be monitored to assess the impact on both sustainability of the reformed system and how household saving behaviour reacts.¹⁴

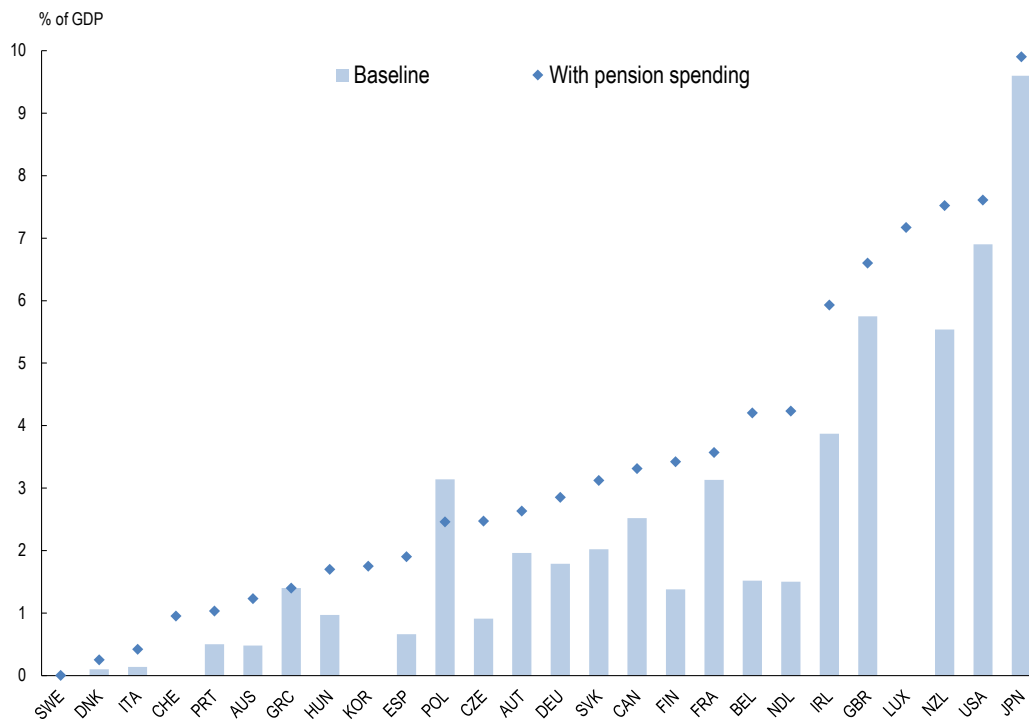
In some countries, the increase in pension spending over the next 40 years does not represent a major challenge. For instance, in Denmark, the projected increase in pension spending is of negligible size and the population is "greying" at a slow pace. In other countries, where pension spending is expected to increase moderately, the fiscal gap is adversely affected, but the dynamics of pension spending does not put significant additional pressure on public finances (e.g. in Germany, France, the United Kingdom, the United States and Japan).

The rise in consolidation requirements is far more pronounced in those countries where the increase in pension spending as a share of GDP is large (e.g. in ascending order Hungary, Switzerland, Finland, the Netherlands, Belgium, Korea and Luxembourg). In Finland, while ageing increasingly weighs on the public finances, considerable financial assets have been built up for supporting future pension spending. In the Czech and Slovak Republic and Canada, the change in pension spending is quite large. However, pressures on public finances from increasing pension spending are partially muted, because the population in these countries is comparatively young compared with the other OECD countries.

The fiscal gaps of the countries facing the largest pension spending pressures, such as Belgium, the Netherlands and Luxembourg are large and underline the need for prompt institutional reforms. In Greece and Spain, re-

¹⁴ In Poland efforts have also been made to reduce the generosity of public-sector pensions, which for some groups have been particularly generous.

Figure 2 - Fiscal Gaps with Pension Spending. Change in the Underlying Primary Balance Needed to Bring Debt to 50% of GDP



Note: The change is from the underlying primary balance in 2012.

forms of their pension system in 2010 addressed the pressure emanating from this source.

3.3 The Effects of Health Spending Pressures

In the last decades, government health care expenditures have been growing much more rapidly than GDP in OECD countries. Therefore an additional source of pressures on public spending comes from rising health care costs. In the case of health care spending, a higher level of spending is not necessarily undesirable (Hall and Jones, 2007). However, financing higher spending by raising taxes will involve additional distortionary effects. Rapidly rising health care prices and developments of new costly treatments put upward pressures on health-care budgets. Spending on health care is already one of the largest public spending items, accounting for more than 15% of general government spending on average in the OECD in 2007. Pressures from spending on long-term care are expected to grow in the future across most OECD countries. Most OECD countries currently allocate between about 1 and 1.5% of GDP to long-term care, but they could at least double by 2050.¹⁵ Changes in spending are phased in gradually so

¹⁵ Oliveira-Martins and de la Maisonnewe (2006); Duval and de la Maisonnewe (2010); European Commission (2009b).

that spending-to-GDP ratios equal estimates of health and long-term care in 2025 and 2050 (Oliveira-Martins and de la Maisonnette, 2006). Spending does not depend on the ageing profile over the projection horizon.¹⁶

This scenario is based on the assumption that only health spending is assumed to change over the horizon, while pension spending is kept constant. In this scenario, we assume that, on top of demographic effects, spending grows by 1% per annum faster than income, which would be broadly consistent with observed trends over the past two decades (see also Hagist and Kotlikoff, 2009). Additional pressures arise from long term care spending.

The projected increase in health and long-term care spending by 2050 is on average between 3.5 per cent of GDP to around 6% of GDP, depending on the assumptions about the pace of spending growth. As the projected increases are relatively similar the impact on the fiscal gaps does not vary much, but exceeds 1.5% of GDP in Switzerland, the Czech Republic, Canada, New Zealand and Japan when greater cost pressures affect health spending (Figure 3). When the projected increase in health spending is phased in, fiscal consolidation becomes somewhat more difficult in all countries except Sweden. Although Sweden has one of the most generous welfare states, health system performs very efficiently due to several institutional reforms started in late 1990s.¹⁷ In a few countries, the projected increases in long term care are substantial and add significantly to the fiscal gap, particularly for Italy, Luxembourg, Finland and Ireland, where such spending adds around an additional percentage point of GDP to the fiscal gap.

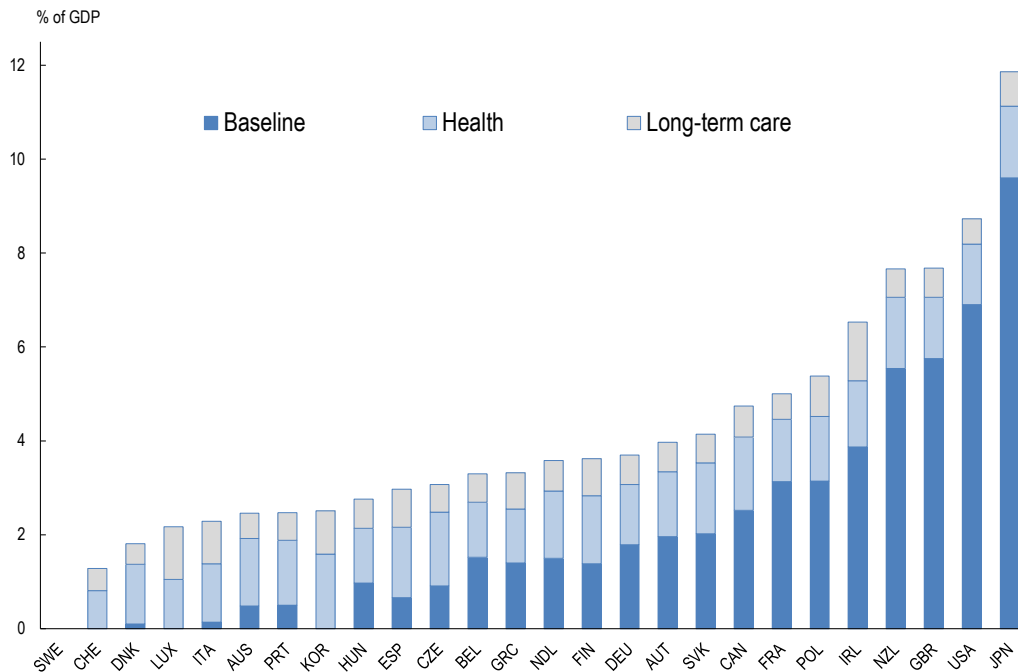
4 The Role of Institutions in Facilitating Fiscal Consolidation

Against the background of impaired fiscal positions and the moderate pace of recovery, it is particularly important to implement institutional reforms that facilitate fiscal consolidation without having strong negative effects on near-term activity. Institutional reforms have also effect on the response of private sector to consolidation, as they help convincing of the

¹⁶ Future trends in spending can be affected by a number of factors (including income growth, technical progress and relative health prices), of which ageing represents a relatively small share. Moreover, a large number of papers (Seshamani and Gray, 2004; Breyer and Felder, 2006; Werblow et al., 2007) assume that what matters for health spending is not age per se, but rather the proximity to death. Therefore population ageing, if associated with additional years of healthy life, would not necessary put pressures on health spending.

¹⁷ Over the past 10 years, reform in Sweden have aimed at: (i) shortening waiting times for services; (ii) promoting the privatization of primary care and more competition in the pharmacy sector; (iii) restructuring hospital sector involving specialization and concentration of services; (iv) increasing the degree of regionalization of health care services and improving the coordination of care for older people.

Figure 3 - Fiscal Gaps with Health and Long-Term Care Spending. Change in the Underlying Primary Balance Needed to Bring Gross Financial Liabilities to 50% of GDP



Note: The change is from the underlying primary balance in 2012.

durability of the adjustment.

In this section, we first consider the effect of reforms to pension systems (e.g. gradually raising the retirement age). Then, we consider the implications of reforms to increase efficiency in the provision of health services.

4.1 *The Effects of Delaying the Retirement Age*

Population ageing has led to a substantial “greying” of the working age population in OECD countries. As a consequence, aggregate participation and employment rates are expected to decline and old-age dependency ratios to rise (Burniaux et al., 2004). Therefore, pension reforms are required to put the public finances on a sustainable footing. Raising the retirement age is on the reform agenda in many countries. Previous studies have warned about the adverse effects of early retirement and measures that encourage labour market withdrawal on labour market performance (Blöndal and Scarpetta, 1998; Casey et al., 2003). Such schemes tend to reduce labour force participation of older workers. During the recent crisis, governments have not given in to the temptation to open pathways to early retirement. For instance, while several OECD countries have raised the level and/or duration of unemployment benefits, no specific measures have been taken for older workers (OECD, 2010). Indeed, some countries facing the fastest growth in

pension spending have begun to reform their pension systems.¹⁸ There are a number of approaches to managing pension spending, including tightening the access for a public pension through raising the retirement age and reducing access to early retirement and other pathways to early retirement such as through disability pensions.

Postponing the retirement age is desirable for various reasons. First, raising the retirement age would curb the rise in ageing-related spending, while at the same time increase private consumption and generating higher tax revenues. These gains can be used by governments to cut taxes and pay off debt (Barrell et al., 2009). Second, postponing retirement could be particularly effective in achieving medium-term consolidation, without negative effects on short-term demand. Third, raising the retirement age would increase labour force participation and employment of older workers and hence stimulate output.¹⁹

In these fiscal gap simulations, which explore the consequences of raising the retirement age, the effective retirement age is gradually increased so that by 2050 individuals are working five years longer (Figure 4).²⁰ The old age dependency ratio is now defined as the ratio of population above 70 years old over working age population.

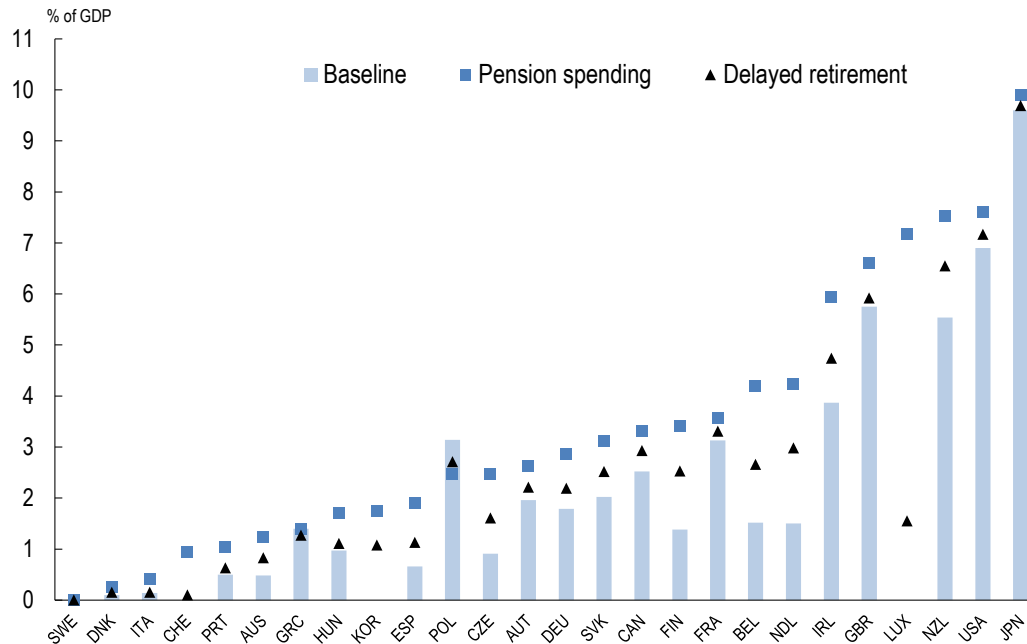
The impact of delaying retirement can be considerable. In those countries where fiscal gaps are large as a consequence of pension spending (e.g. Belgium, Luxembourg and the Netherlands), the reduction in the fiscal gap can be several percentage points. In the case of Luxembourg the increasing number of cross-border workers who will reach retirement age creates a particular problem. The short-term financing of the pension system is currently supported by a low old-age dependency ratio, as well as by contributions paid by relatively young cross-border workers. In the future, both factors will reverse and pension costs are anticipated to increase substantially.

¹⁸ For example, Greece has started implementing a pension reform. In May 2010, the Greek government approved a bill aimed at reforming the country's ailing social security system. The statutory retirement age for women will be raised by five years to 65 immediately to match the current retirement age for men. The government will introduce financial penalties and disincentives for early retirement. These measures are aimed to increase employment and GDP and hence tax revenues and to lower social benefits. Following the reform, the estimates suggest there will be no further increase in pension spending as a percent of GDP, instead of projections that suggested a fiscal gap of almost 12% of GDP before the reform.

¹⁹ Duval (2003) and Blundell et al. (2002) examines the impact of early retirement incentives embedded in pension systems and other social transfer programs on the labour force participation of older workers. In Duval (2003) panel data econometric estimates show that implicit taxes on continued work have sizeable effects on the departure of older male workers from the labour force. Similar results are reached by Blundell et al. (2002) who estimate binary response models of retirement including pension incentive measures, and simulate the impact of occupational pension incentives.

²⁰ While the labour force expands with the gradual increase, to maintain simplicity unemployment rates and participation rates are assumed to remain unchanged. Only pension spending is assumed to change over the horizon, while health spending is kept constant.

Figure 4 - The Effects of Delaying the Retirement by Five Years on Fiscal Gaps. Change in the Underlying Primary Balance Needed to Bring Gross Financial Liabilities to 50% of GDP in 2050



Note: The change is from the underlying primary balance in 2012.

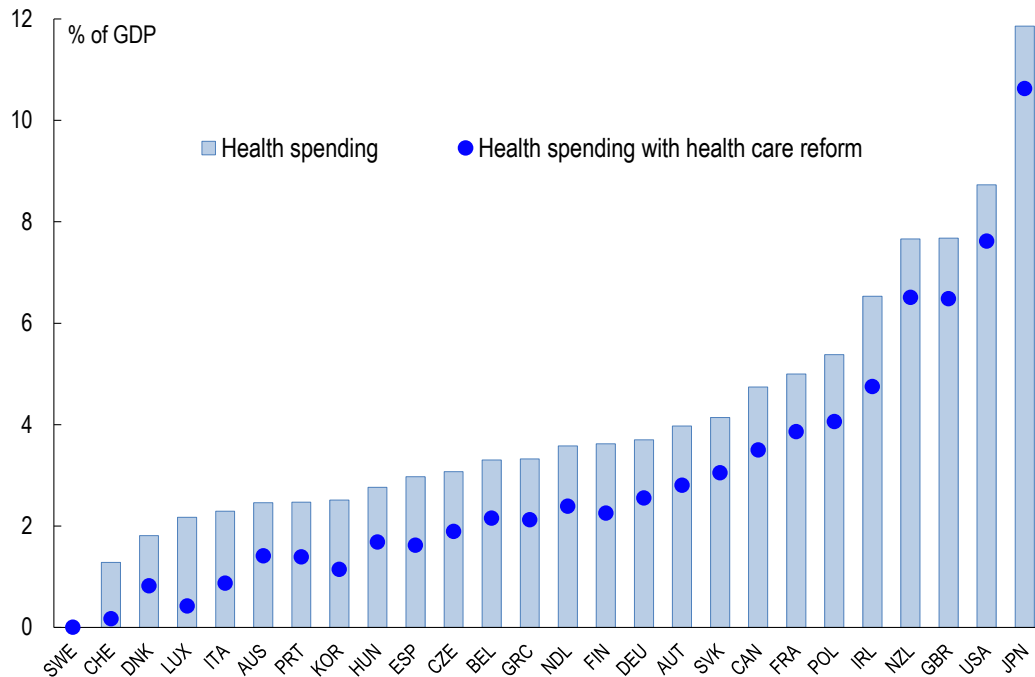
4.2 Institutional Reforms of the Health System

Reforms to health and long-term care spending could also ease some of the pressure on budgets. These reforms often address the supply side of health care delivery (e.g. modifying the incentives of practitioners) but may also act on the demand side (e.g. co-payments, possibly exempting the most vulnerable).

The last scenario assumes that health spending increases, but policies are in place to control expenditure growth.²¹ Figure 5 shows the effect of assumptions that countries are able to moderate the projected increases in health and long-term care spending. The possible scope for savings on health and long-term care may be larger for some countries. Recent research (see Joumard et al., 2010) suggests that reforms of health-care systems could lead to efficiency gains of almost 2% of 2017 GDP on average in the OECD countries. However, there is no particular institutional arrangement that

²¹ We use the estimates of Oliveira-Martins and de la Maisonneuve (2006) as they provide projections of health spending under “cost containment scenario”, which incorporates the effect of efficiency gains in the provision of health services. In simulating this scenario, Oliveira-Martins and de la Maisonneuve (2006) assume that the residual expenditure growth converges to zero by 2050, which implicitly means that some policies are effective in improving efficiency and innovation and hence help controlling the expenditure growth driven by some of the non-demographic factors.

Figure 5 - The Effect of Health Reform on Fiscal Gaps. Change in the Underlying Primary Balance Needed to Bring Gross Financial Liabilities to 50% of GDP in 2050



Note: The change is for primary balance in 2012. Spending on long-term care is included in total health spending.

performs systematically better than others, and cost containment strategies are therefore specific to a country's starting point, including its choice of health-care model. The research suggests that, generally, the most effective reforms include those that strengthen and broaden the role of market mechanisms, change reimbursement schemes (e.g. from fee-for-service to capitation or a mix of both), improve public management and control, and impose budget caps.

5 Concluding Remarks

The fiscal gap calculations show that considerable differences exist across OECD countries in their need for fiscal consolidation. These large differences arise largely due to differences in underlying deficits at the starting point and to some extent the level of initial debt. While a number of countries (e.g. Korea, Luxembourg, Sweden and Switzerland) have already achieved sound fiscal balances, other countries, where underlying fiscal deficits are expected to remain substantial in 2012 (e.g. Japan, New Zealand, the United Kingdom and the United States) face much larger fiscal gaps.

The various scenarios presented in this paper suggest that in several OECD countries, the fiscal challenges are exacerbated in the long term by spending pressures related to pension, health-care and long-term care. There-

fore, to assess whether the public finances are sustainable, projected health and pension costs cannot be neglected. Given the scale of ageing and health and pension costs, reforms to entitlement programmes need to be an important part of any longer-term sustainability strategy. For example, institutional reforms to the pension system, by increasing the retirement age, can boost labour utilisation, while at the same time can mitigate the budget pressures resulting from ageing populations. In addition, the institutional framework, by promoting efficiency in the provision of health services may reduce the debt-to-GDP burden without compromising growth. Institutional reforms may hence support long-term fiscal sustainability without weighing on aggregate demand in the short-run.

The analysis presents some limitations which open the way for further extensions. The main argument in favour of fiscal consolidation is that if it is perceived as a serious attempt to reduce the public sector borrowing requirements, households and firms responded to improved confidence about the future increasing private consumption and investment (Giavazzi and Pagano, 1990). This wealth effect is reinforced by the crowding-in of private investment generated by the reduction in the risk premium: the decrease in government borrowing requirements diminishes the risk premium associated with public debt issuance, contributes to reduce real interest rates. In this context, Alesina and Perotti (1996) and Ardagna (2004) argue that the composition of the fiscal adjustment is a crucial aspect to analyze when assessing the expansionary implications of fiscal consolidation on growth, because it may have economic effects via the labour market. Therefore, feedback effects of changes in taxes and public expenditure on labour supply decisions are another relevant aspect to take into account when assessing long-run fiscal sustainability.

One limitation of the fiscal gap approach is that it does not take into account the composition of the fiscal adjustment, whether it has to be implemented by raising taxes or by cutting public expenditures. In such a way, it is not suitable for assessing some of the side-effect on growth, especially those arising from the supply side. Therefore, results based on the fiscal gap approach should be complementary to those based on the analysis of fiscal multipliers.

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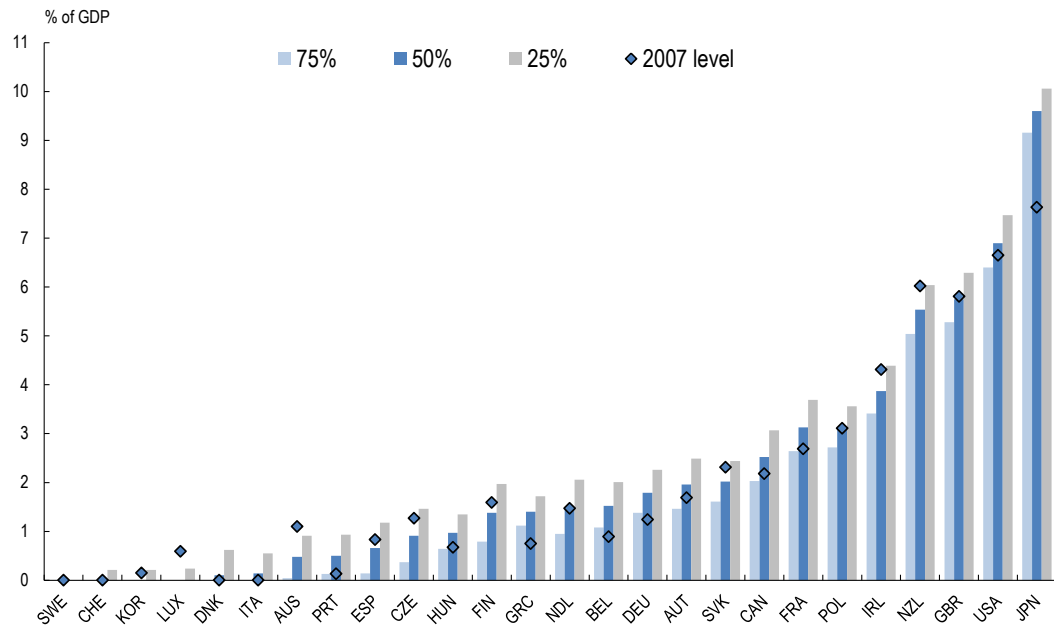
Appendix: Alternative Debt Targets

An additional set of simulations examine the implications of setting alternative debt targets (e.g. returning debt to pre-crisis levels and to 75% and 25% of GDP). The underlying motivation is that, according to both theoretical and empirical literature, high public debt levels may have adverse effects on growth and inflation.²² These considerations argue in favour of debt ceilings with lower prudent debt targets (e.g. 25%), which might be more desirable to face contingent liabilities. Moreover, as the OECD countries are quite heterogeneous, different target might be recommended for different countries. For example, the lower gross debt target may be less compelling for countries with large government financial asset holdings. In other cases, where the public has demonstrated a preference for very low levels of debt a high debt target is clearly inappropriate.

The fiscal gaps do not change markedly relative to the baseline if alternative debt targets are used, with the exception of returning debt to the pre-crisis level (Figure 1A). The calculations suggest that the extra degree of fiscal consolidation needed to bring debt down to prudent levels is relatively modest if implemented over a long period. If the aim is to return gross debt to the pre-crisis level, consolidation requirements would remain demanding for some countries. Reducing debt to the pre-crisis level is an ambitious goal, because in some of these countries (e.g. the United Kingdom, Ireland, New Zealand and the United States) the debt-to-GDP ratio in 2007 was relatively low. At the other extreme, for Japan, returning to the very high pre-crisis debt level is somewhat less onerous, but the fiscal gap is still large.

²² For example, Caner et al. (2010) found a threshold effect at 77% of GDP for a large sample of countries, with again the threshold being lower for emerging markets; Kumar and Woo (2010) found that a 10 percentage point increase in debt reduces annual real per capita GDP growth by 0.2 percentage points per year, with the effect being smaller for advanced economies and some evidence for non-linearity beyond a debt-to-GDP ratio of 90% of GDP; for the euro area countries, Checherita and Rother (2012) found an inverted U-shaped relationship with a turning point in the growth and debt-to-GDP ratio relationship between 90 and 100%. They also found a negative linear relationship between the change in the debt-to-GDP ratio and growth of 0.1 percentage point. Cecchetti et al. (2011) find that beyond a certain level, debt is a drag on growth. For government and household debt, the threshold is around 85% of GDP, while for corporate debt the threshold is 90% of GDP.

Figure 1A - Fiscal Gaps for Alternative Debt Targets. Change in Underlying Primary Balance Needed so that Gross Financial Liabilities Equals 75%, 50% or 25% of GDP or Returns to the 2007 Level in 2050



Note: The change is from the underlying primary balance in 2012.