

# Are advanced economies at risk of falling into debt traps?

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## Executive summary

**THE GROSS GENERAL** government debt-to-GDP ratios in many advanced economies have reached the highest levels in peacetime history and continue to grow, putting into question sovereign solvency in these economies. In case of new adverse shocks, whether economic or political, global or country-specific, which result in the deterioration of growth prospects or higher real interest rates, or both, the situation could easily get out of control.

**APART FROM THE** risk of sovereign default, excessive public debt might also have a negative impact on the stability of financial sector and on economic growth in the medium and long term.

**OUR DEBT SUSTAINABILITY** simulations for the group of highly-indebted advanced economies – those in which the general government gross public debt-to-GDP ratio exceeded 80 percent in 2015 – suggest that benefits of the current record-low interest rates and post-crisis growth recovery should be used for fiscal consolidation. The aim of this should be not only to stop further expansion of debt-to-GDP ratios, but also to gradually reduce them. Such corrective measures are needed in six out of seven G7 members (Germany being the exception) and in 10 out of 19 euro-area members. The fiscal situation of Japan, where gross debt has reached 250 percent of GDP, is particularly precarious.

**IN ADDITION, UNLESS** there are reforms of public pension, health and long-term care systems, fiscal consolidation in advanced economies must also create room for the higher spending levels in these areas that will result from aging populations.

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# 1 Introduction

**Surprisingly, relatively little attention has been paid to the rapid growth in public debt in most advanced economies.**

One of the consequences of the global financial crisis has been rapid growth in public debt in most advanced economies<sup>1</sup>. This is the result of overoptimistic estimates of the fiscal situation before the crisis, declining government revenues and increasing social expenditure during the crisis, combined with the costs of financial system restructuring, countercyclical fiscal policies and slower growth since the crisis. In addition, negative demographic trends (population aging) add to both explicit and implicit public debt in the medium and long runs.

In this context, in 2015, general government gross debt exceeded 100 percent of GDP in Japan, Greece, Italy, Portugal, Cyprus, Belgium and the United States, in some cases by large margins (Japan's gross debt approaches 250 percent)<sup>2</sup>. In Spain, Singapore, France, Ireland and Canada it was between 90 and 100 percent of GDP, and in the United Kingdom, Austria and Slovenia it was between 80 and 90 percent. In many countries, these are record highs in peacetime. For the group of advanced economies as a whole, it is the highest debt level since the late 1940s (Gaspar and Escolano, 2016).

Only in four of the highly-indebted advanced economies – Ireland, Germany, Iceland and Israel – has there been a decreasing debt-to-GDP trend recently. In other cases, the debt-to-GDP ratio has either stabilised at a high level or continues to grow, bringing into question sovereign solvency in the medium-to-long term.

Surprisingly, relatively little attention has been paid to this threat in debates over policy<sup>3</sup> (except in countries that have already lost market access, such as Greece). Questions about rising debt have been overshadowed by numerous calls to abandon 'austerity' policies (see eg Krugman, 2015, or Bloomberg, 2016), downplaying of the risks of high debt (Skidelsky, 2016), or even arguments (contrary to statistical evidence) that debt has already started declining (Roubini, 2016). Financial markets also seem to have turned a blind eye to the issue of the fiscal sustainability of several sovereign borrowers. This is perhaps a result of dominant short-termism in both policy debates and the business strategies of financial market players.

This sort of myopia underestimates the potential negative consequences of excessive sovereign debt for financial stability and growth, globally and, in particular, in Japan and Europe. A strong adverse shock could easily trigger a financial crisis of much greater magnitude than the 2007-09 global financial crisis, or the European financial crisis of 2010-13.

In this Policy Contribution, we assess the size of public debt in advanced economies and consider the potential consequences of sovereign insolvency. We make simple debt sustainability projections for advanced economies to estimate the primary fiscal balances required to stabilise or reduce the 2015 gross debt-to-GDP level on the basis of various macroeconomic assumptions. We also analyse major implicit public commitments related to public pensions, healthcare and long-term care systems and financial systems, and look at the potential negative spillovers from excessive public debt onto the financial sector and growth.

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1 The term *advanced economies* is borrowed from the International Monetary Fund's World Economic Outlook (IMF WEO) country grouping; see <http://www.imf.org/external/pubs/ft/weo/2016/01/weodata/weoselagr.aspx>. To simplify the analysis, we do not include Hong Kong, Macau, Puerto Rico or San Marino, which belong to the group of advanced economies in the IMF WEO classification.

2 Figures from IMF World Economic Outlook Database, April 2016 edition.

3 Rogoff (2012), Feldstein (2016a; 2016b), Reinhart (2016) and Boskin (2016) are recent examples of warnings, although formulated in a rather soft manner.

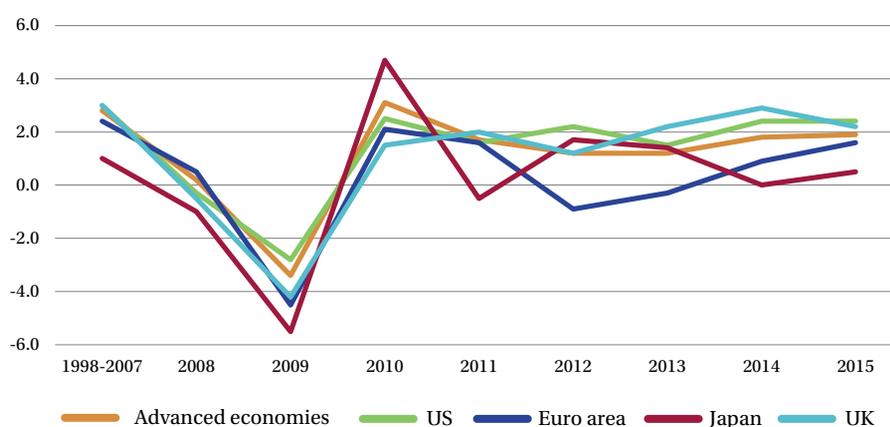
## 2 The dynamics of public debt

Table 1 provides an overview of general government gross debt in advanced economies from 1999-2015. A number of observations can be made based on this data:

1. In most of the countries shown, the debt level in 2015 was higher, sometimes much higher, than in 1999. Belgium, Denmark, Malta, Sweden, Switzerland and, probably, Israel (comparable 1999 data for this country is not available) are exceptions.
2. The same observation holds in aggregate for the European Union, the euro area and, most likely, the group of advanced economies overall (there is a lack of comparable data for 1999). For the EU the increase is 23.3 percentage points of GDP and for the euro area, 22.8 percentage points of GDP.
3. Two sub-periods can be distinguished – before and after the global financial crisis. Between 1999 and 2007, because of high growth, several countries (Australia, Belgium, Canada, Denmark, Estonia, Finland, Iceland, Ireland, Israel, Italy, Latvia, Lithuania, Netherlands, New Zealand, Slovakia, Spain, Sweden and Switzerland) reduced their gross debt-to-GDP levels. However, others failed to do so, either stabilising their earlier high debt-to-GDP ratios, or further increasing them. This group included the largest economies such as the US, Japan, Germany, the UK and France; oil-producing Norway, Asian ‘tigers’ (Korea, Taiwan and Singapore, although the first two from moderate levels), Austria and the Czech Republic (the latter also from low to moderate level); and countries that later were victims of the European financial crisis – Greece, Portugal and Cyprus.
4. In the aftermath of the global financial crisis, general government gross debt increased rapidly almost everywhere except the few countries mentioned in paragraph 1, above. Declining growth (see Figure 1), especially in the 2009 recession, and financial sector problems were the major drivers of this trend. More specifically: (i) government revenues declined sharply, especially revenues from the financial sector, which had contributed to a major part of total revenue before the crisis; (ii) in many countries, governments had to support failing banks and other financial institutions to avoid/mitigate systemic financial crisis (see section 5.3); (iii) social expenditures increased as result of higher unemployment and lower personal incomes; (iv) many countries launched discretionary fiscal stimulus both on the revenue and expenditure sides.

**In the aftermath of the global financial crisis, general government gross debt increased rapidly almost everywhere.**

**Figure 1: Annual change in real GDP in advanced economies, %, 1998-2015**



Source: IMF World Economic Outlook Database, April 2016.

**Table 1: Advanced economies, general government gross debt, % of GDP, 1999-2015**

Country/country group	1999	2003	2007	2010	2013	2015
Australia	22.6	13.2	9.7	20.5	30.8	36.8
Austria	66.4	65.5	64.8	82.3	80.8	86.2
Belgium	114.4	101.1	86.9	99.6	105.1	106.3
Canada	89.3	76.2	66.8	81.1	86.1	91.5
Cyprus	55.9	63.4	53.6	56.3	102.5	108.7
Czech Rep.	15.2	28.1	27.8	38.2	45.2	40.9
Denmark	56.8	46.2	27.3	42.9	44.6	45.6
Estonia	6.0	5.6	3.7	6.6	9.9	10.1
Finland	44.0	42.7	34.0	47.1	55.4	62.4
France	60.0	63.9	64.2	81.5	92.3	96.8
Germany	60.0	63.0	63.6	81.0	77.4	71.0
Greece	88.6	93.9	102.8	145.8	176.9	178.4
Iceland	39.1	38.5	27.3	88.3	84.8	67.6
Ireland	46.7	29.9	23.9	86.8	120.0	95.2
Israel	n/a	92.9	72.7	70.6	67.2	64.6
Italy	109.7	100.5	99.8	115.4	128.9	132.6
Japan	135.6	169.6	183.0	215.8	244.5	248.1
Korea	16.7	20.4	28.7	30.8	33.8	35.9
Latvia	11.8	13.9	7.2	40.3	35.9	34.8
Lithuania	28.1	21.0	16.7	36.3	38.8	42.5
Luxembourg	6.7	6.4	7.0	19.6	23.3	21.8
Malta	69.5	68.7	62.4	67.6	68.6	64.0
Netherlands	58.2	49.3	42.4	59.0	67.9	67.6
New Zealand	28.5	22.0	14.5	26.9	30.8	30.4
Norway	24.3	42.7	49.2	42.4	30.3	27.9
Portugal	49.0	54.7	68.4	96.2	129.0	128.8
Singapore	83.6	97.6	84.7	97.0	102.5	98.2
Slovakia	47.1	41.6	29.9	40.8	54.6	52.6
Slovenia	22.0	27.0	22.7	37.9	70.5	83.3
Spain	62.5	47.6	35.5	60.1	93.7	99.0
Sweden	61.4	49.1	38.1	37.6	39.8	44.1
Switzerland	55.8	59.4	49.5	46.1	46.4	45.6
Taiwan	23.7	32.0	32.1	36.7	39.1	38.3
UK	41.7	37.3	43.5	76.6	86.2	89.3
US	n/a	58.5	64.0	94.7	104.8	105.8
Advanced economies	n/a	73.4	71.4	97.6	104.8	104.8
Euro area	70.4	67.8	64.9	84.0	93.4	93.2
EU	64.1	60.7	58.3	78.5	87.0	87.4

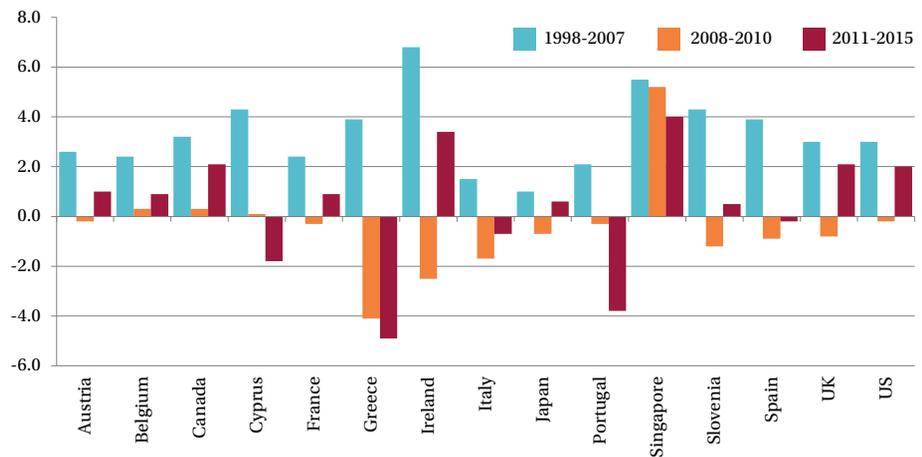
Source: IMF WEO, April 2016. Note: cells in yellow indicate IMF staff estimates. Note: EU countries Bulgaria, Croatia, Hungary, Poland and Romania are not included in the IMF advanced economies grouping.

**Eight years after the collapse of Lehman Brothers, public debt expansion has not stopped in most advanced economies.**

5. As of autumn 2016, eight years after the collapse of Lehman Brothers, public debt expansion has not stopped in most advanced economies, especially in those with high and very high debt levels. Only four – Ireland, Germany, Iceland, and Israel – have started reducing their debt-to-GDP ratios. Among the countries with low or moderate gross debt-to-GDP levels, a visible decreasing trend could be observed only for the Czech Republic, Latvia, Norway and Switzerland. Aggregate ratios for advanced economies, the euro area and the EU stabilised at very high levels (104.8, 93.2 and 87.4 percent of GDP, respectively).
6. In 2015, 14 out of 19 euro-area countries breached the upper general government gross debt limit of 60 percent of GDP as determined by the Treaty on the Functioning of the EU. Ten of them recorded debt levels higher than 80 percent of GDP, and five (Greece, Italy, Portugal, Cyprus and Belgium) had debt higher than 100 percent of GDP. Interestingly, the group that breached the 60 percent level includes not only countries affected by the European financial crisis, such as Greece, Ireland, Portugal, Spain, Cyprus and Slovenia, but also those which are generally considered part of the ‘prudent’ core or ‘North’ (Germany, the Netherlands, Finland, Austria, Belgium and France).
7. Outside the euro area, the biggest ‘sinners’ were Japan (248.1 percent of GDP), the US (105.8 percent of GDP), Singapore (98.2 percent of GDP), Canada (91.5 percent of GDP) and the UK (89.3 percent of GDP). Worse, none of these, except Singapore, was able to reverse the debt expansion trend.
8. As Figures 1 and 2 show, economic growth in most advanced economies from 2011-15 remained considerably lower than in the pre-crisis decade of 1998-2007, making it unlikely that they will ‘outgrow’ their debts.

Overall, the picture looks rather gloomy and puts into question the debt sustainability of at least some of the analysed countries.

**Figure 2: Average annual changes in real GDP in highly-indebted advanced economies, in percent, 1998-2007, 2008-10, and 2011-15**



Source: World Economic Outlook Database, April 2016.

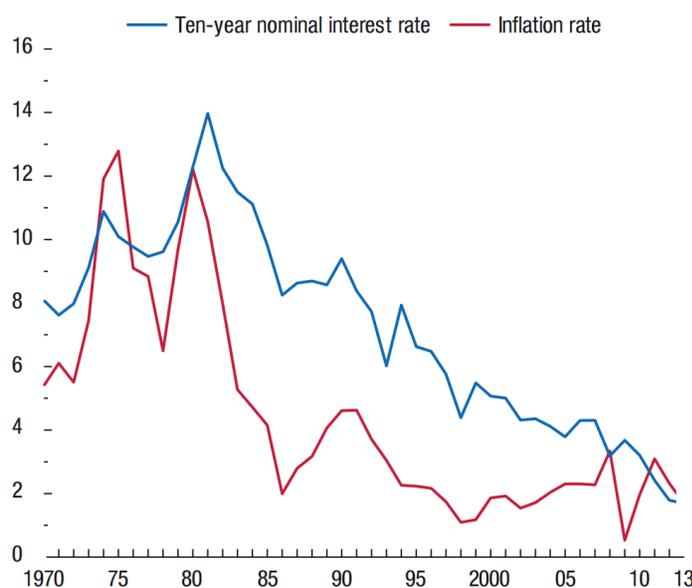
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## 3 Debt sustainability analysis

To verify whether the public debt in the highly-indebted advanced economies remains on a sustainable path we carried out two simple debt simulations (Box 1). First, Simulation 1 determines the primary fiscal balance-to-GDP ratios required to stabilise countries' 2015 debt-to-GDP ratios assuming that in subsequent years, the rate of real GDP growth and real interest rates will remain at the 2015 level. Both assumptions can be considered rather optimistic, given relatively good growth in 2015 in most analysed countries compared to the 2011-2015 average (Figure 2), and historically record-low nominal and real long-term interest rates in 2015 (Figure 3).

**Figure 3: Ten-year interest rate on government bonds and inflation, 1970-2013, % [simple average across France, Germany, UK and US]**



Source: IMF (2014), Figure 3.1, p81.

Table 2 presents the results of Simulation 1. Eight out of fourteen analysed countries do not need to conduct additional fiscal adjustment to stabilise their gross debt-to-GDP ratios at the 2015 level. In fact, they can even relax their fiscal policies and stay within the assumed debt limit. France and the US must undertake relatively modest fiscal tightening efforts (less than 1 percent of GDP). Four remaining countries (Japan, the UK, Cyprus and Canada) are in less comfortable positions.

Japan's fiscal position looks particularly precarious from this simple and static simulation. It must improve its primary general government balance by more than 3 percent of GDP to prevent a further increase in its gross debt-to-GDP ratio. And one must remember that a negative real interest rate of -1.62 percent in 2015 was very supportive of the Japanese budget and will not necessarily be continued in the subsequent years.

As mentioned, the macroeconomic parameters in 2015 were relatively favourable in most advanced economies – economic growth was close to potential and there were historically record-low nominal and real interest rates. Such conditions will not necessarily continue in the medium to long term.

In particular, real interest rates might pick up at some point, for example as a result of exit from extra-loose monetary policies. Real interest rates for government bonds are determined by a range of sometimes contradictory factors related to the global supply of savings and demand for those particular instruments (see IMF, 2014, chapter 3). While

predicting how these factors will work in future goes beyond remit of this paper, we cannot exclude real interest rate increases and should therefore test the impact of this variable in our sustainability analysis to understand its potential consequences for the size of fiscal adjustment required to avoid further debt-to-GDP increases. We thus run Simulation 2, which assumes real interest rates of 2 percent for each country, this level being justified by the average historical record of advanced economies prior to the global financial crisis (Figure 3). Other assumptions remain the same as in Simulation 1.

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### Box 1: Debt sustainability simulations

Our simulations are based on the following equation (Escolano 2010)

$$d_t - d_{t-1} = \frac{r_t}{1+g_t} d_{t-1} - \frac{g_t}{1+g_t} d_{t-1} - p_t \quad (\text{Eq.1})$$

where  $d_t$  = general government gross debt-to-GDP ratio at the end of period t

$d_{t-1}$  = general government gross debt-to-GDP ratio at the end of period t-1

$r_t$  = real interest rate in period t computed as  $r_t = [(1 + i_t)/(1 + \pi_t)] - 1$

$i_t$  = nominal interest rate in period t

$\pi_t$  = change in the GDP deflator between t - 1 and t

$g_t$  = the rate of growth of real GDP between t-1 to t

$p_t$  = the ratio of primary fiscal balance (deficit or surplus) to GDP in period t

It follows from Eq.1 that an increase in the general government gross debt-to-GDP ratio can be explained by:

- General government primary deficit, ie when non-interest general government expenditure exceeds its revenue;
- Real interest rate of general government borrowing which exceeds the real growth rate of GDP.

For this analysis, we define highly-indebted advanced economies as those whose general government gross public debt-to-GDP ratio exceeded 80 percent in 2015 (see Table 1). We exclude Greece from our sample because it was the subject of the subsequent rescue programmes, under which debt financing has been provided at below market interest rates. Furthermore, Greece is unlikely to return to the private debt market soon. Perhaps another debt restructuring will be needed for Greece to regain market access (see IMF, 2016a).

We run two simulations to estimate the minimum primary fiscal balance required to achieve the targeted level of general government gross public debt in relation to GDP under various sets of assumptions. Consequently, we rewrite Eq.1 as follows:

$$p_t = \frac{r_t}{1+g_t} d_{t-1} - \frac{g_t}{1+g_t} d_{t-1} - d_t + d_{t-1} \quad (\text{Eq.2})$$

if  $d_t = d_{t-1}$  (what is assumed in our simulations), Eq.2 can be further simplified as follows:

$$p_t = \frac{r_t}{1+g_t} d_{t-1} - \frac{g_t}{1+g_t} d_{t-1} \quad (\text{Eq. 3})$$


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The results of Simulation 2 (Table 3) look more alarming than those of Simulation 1. All countries except Ireland<sup>4</sup> would have to undertake serious fiscal adjustment to prevent further expansion of their debt-to-GDP ratios. For Japan, fiscal tightening of close to 9 percent of GDP may look problematic politically<sup>5</sup>, even if Japan's room to increase taxes<sup>6</sup> seems to be greater than that available to other advanced economies. An increase of real interest rates to historically 'normal' levels would make Japan's public debt burden hardly controllable.

**Table 2: Highly-indebted advanced economies: fiscal adjustment required to stabilise 2015 debt-to-GDP ratio (Simulation 1, 2015 parameters)**

Country	$d_{t-1}$	$d_t$	$i_t$	$\pi_t$	$r_t$	$g_t$	$p_t$ (required)	$p_t$ (actual 2015)	Minimum size of fiscal adjustment (8-9)
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>
Austria	86.20	86.20	0.74	1.5	-0.75	0.88	-1.75	0.31	-2.06
Belgium	106.30	106.30	0.85	0.9	-0.04	1.37	-1.31	-0.28	-1.03
Canada	91.50	91.50	1.53	-0.5	2.07	1.18	0.78	-0.71	1.49
Cyprus	108.70	108.70	3.88	-1.4	5.37	1.59	3.85	1.44	2.41
France	96.80	96.80	0.86	1.2	-0.32	1.14	-1.48	-1.72	0.24
Ireland	95.20	95.20	1.18	5.3	-3.92	7.81	-11.24	1.12	-12.36
Italy	132.60	132.60	1.70	0.8	0.94	0.76	0.36	1.39	-1.03
Japan	248.10	248.10	0.36	2.0	-1.62	0.47	-1.80	-4.93	3.13
Portugal	128.80	128.80	2.43	1.9	0.48	1.47	-0.65	-0.28	-0.37
Singapore	98.20	98.20	2.43	1.6	0.78	2.01	-1.24	-0.31	-0.93
Slovenia	83.30	83.30	1.67	0.4	1.23	2.88	-2.16	-0.57	-1.60
Spain	99.00	99.00	1.74	0.6	1.12	3.21	-2.05	-1.81	-0.24
UK	89.30	89.30	1.82	0.3	1.50	2.25	-1.00	-2.83	1.83
US	105.80	105.80	2.13	1.0	1.12	2.43	-1.15	-1.75	0.60

Sources: IMF World Economic Outlook database, April 2016 for  $d_{t-1}$ ,  $\pi_t$ ,  $g_t$  and actual  $p_t$ , Bloomberg for it. Notes: [1] columns 2, 3, 8, 9 and 10 in percentage of GDP, columns 4-7 in percent; [2]  $d_{t-1}$  – gross general government debt-to-GDP ratio in 2015,  $i_t$  – annual average of yields of 10-year Treasury bonds in 2015,  $\pi_t$  – GDP deflator in 2015,  $g_t$  – annual change of GDP in 2015,  $d_t$  – exogenous assumption. See also Box 1.

Furthermore, the assumption of a real interest rate equal to 2 percent for everybody disregards country-specific risk premia. In practice, if financial markets have doubts about government creditworthiness, the real interest rate might increase rapidly (above 2 percent), which will further worsen the prospects of sovereign solvency. This kind of vicious circle of market expectations (or multiple equilibria) has been observed during many sovereign debt crises, eg in Mexico in 1994, Russia in 1997-1998, Argentina in 2000-02, Greece in 2009-10, Ireland in 2010, Portugal in 2010-11 and Cyprus in 2012-13. In the highly-indebted economies, sudden changes in market sentiment can happen as a result of either external or country-specific shocks (economic or political). Such a risk applies not only to the already crisis-affected

4 In 2015 Ireland recorded exceptionally high annual growth of 7.81 percent (effect of the post-crisis recovery) and a negative interest rate of almost 4 percent (a result of high inflation). Even if one can be optimistic about Ireland's future growth prospects, its growth rates in the next few years will, most likely, be lower than in 2015.

5 We agree with Eichengreen and Panizza (2014) that running a high primary surplus for a longer period may be politically difficult.

6 Especially VAT, which was 8 percent in 2015, while total general government revenues amounted to 34 percent of GDP.

countries in the euro area but also to Japan, Italy, Belgium, France and the UK. In other words, high public debt renders countries more vulnerable to changes in market sentiment.

Simulations 1 and 2 assume no improvement in the high debt-to-GDP ratios of 2015 (the debt-to-GDP ratios of EU members are significantly above the Treaty's limits). To avoid a debt trap, a policy of at least slow debt reduction is needed.

Let us assume that each analysed country needs to reduce its debt-to-GDP ratio by 2 percentage points annually from its 2015 level. This is hardly a too-ambitious target for countries with debt exceeding 100 percent of GDP (Italy, Portugal, Cyprus, Belgium, US) or 200 percent of GDP (Japan). For EU countries with debt exceeding 60 percent of GDP, the Stability and Growth Pact (SGP) requires the debt level to be reduced at an annual rate of 1/20th of the difference between the actual and the reference level, ie 60 percent of GDP (Vade Mecum, p72). Thus, each EU country with a debt-to-GDP level exceeding 100 percent is obliged to downsize it by more than 2 percentage points of GDP annually.

**Table 3: Highly-indebted advanced economies: fiscal adjustment required to stabilise the debt-to-GDP ratio of 2015 (Simulation 2 – 2015 parameters,  $r_t = 2$  percent)**

Country	dt-1	dt	$r_t$	gt	pt (required)	pt (actual 2015)	Minimum size of fiscal adjustment
<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>
Austria	86.20	86.20	2.00	0.88	2.96	0.31	2.65
Belgium	106.30	106.30	2.00	1.37	2.67	-0.28	2.95
Canada	91.50	91.50	2.00	1.18	2.68	-0.71	3.39
Cyprus	108.70	108.70	2.00	1.59	2.50	1.44	1.06
France	96.80	96.80	2.00	1.14	2.79	-1.72	4.51
Ireland	95.20	95.20	2.00	7.81	-3.90	1.12	-5.02
Italy	132.60	132.60	2.00	0.76	3.40	1.39	2.01

Sources: IMF World Economic Outlook Database, April 2016. Notes: (1) columns 2-3, and 6-8 in percentage of GDP, columns 4-5 in percent; (2)  $g_t$  – annual change of GDP in 2015;  $r_t$  and  $d_t$  – exogenous assumptions. See also Box 1.

**The fiscal prospects of advanced economies look potentially alarming and call for corrective measures.**

According to our calculations (Eq. 2 in Box 1) a reduction in the debt-to-GDP ratio by 2 percentage points requires the primary fiscal balance to be improved, compared to the results of Simulations 1 and 2, by an additional 2 percentage points of GDP. For several countries, achieving such a goal would necessitate serious fiscal tightening. This would affect Japan, Cyprus, the UK and Canada in Simulation 1, and all countries except Ireland in Simulation 2. This suggests that there is a justification for starting fiscal adjustment now when real interest rates are at a historically low level, rather than postponing further.

In summary, the fiscal prospects of advanced economies look potentially alarming and call for corrective measures. This is the case for six out of seven G7 members, Germany being the only exception. Among the 19 euro-area countries, 10 belong to the group of highly-indebted economies as defined in this Policy Contribution.

Japan's fiscal situation is particularly worrying despite its substantially lower general government net debt-to-GDP ratio (see section 4). A similar conclusion has been reached by the IMF (2016b, pp48-56). In this context, Joseph Stiglitz and Paul Krugman's calls for new massive fiscal stimulus to increase the Japanese growth rate (Nikkei 2016; Sharp 2016) seem to disregard Japan's worrying public debt levels and the ineffectiveness of similar policies in the past<sup>7</sup>.

The fiscal positions of other highly indebted advanced economies seem to be manageable,

<sup>7</sup> Japan experienced a severe and prolonged financial crisis in the 1990s (see Kanaya and Woo, 2000) and has never returned to the pre-crisis high growth rates despite more than two decades of ultra-loose monetary policy and subsequent fiscal stimulus packages. As result, its gross general government debt-to-GDP level increased from 67.0 percent in 1990 to 210.2 percent in 2009 and further to 248.0 percent in 2015.

to various degrees, assuming that real interest rates will not increase soon (Simulation 1) and that the fiscal adjustment suggested by our simulations is not postponed. However, in case of new adverse shocks, whether economic or political, global or country-specific, that result in the deterioration of growth prospects or higher real interest rates, or both, the situation could easily get out of control.

## 4 Gross versus net debt

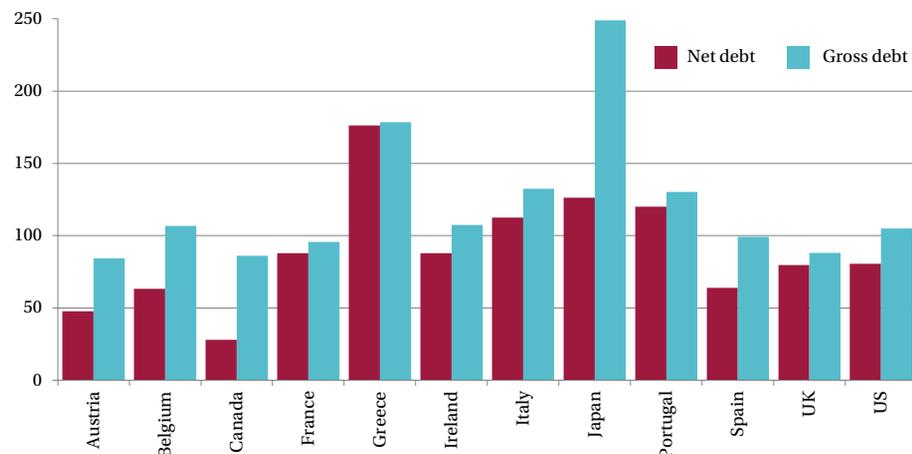
The general government gross debt-to-GDP ratio is the most popular measure of countries' sovereign indebtedness. However, it does not take into account government assets which, at least partly, can counterbalance government liabilities.

To address this problem, fiscal statistics use the indicator of general government *net debt*, which is defined as "...gross debt minus financial assets corresponding to debt instruments. These financial assets are: monetary gold and SDRs, currency and deposits, debt securities, loans, insurance, pension, and standardized guarantee schemes, and other accounts receivable" (GFSM, 2013, para. 7.245).

Gross and net debt can differ substantially when it comes to official creditors, commodity exporters (especially oil producers) who enjoy high resource rents and are able to form sovereign wealth funds during times of commodity booms, and large funded public pension schemes.

Among the highly-indebted advanced economies, the difference between general government gross and net debt is biggest in Japan (Figure 4). Japan's general government net debt amounts approximately to only half of its gross debt (a difference of more than 120 percentage points of GDP). This is another factor (apart from untapped tax potential – see section 3) which allows Japan to continue to enjoy a good credit rating and to avoid high risk premia, despite record-high gross public debt.

**Figure 4: Highly-indebted advanced economies: general government gross and net debt-to-GDP ratios, in percent, 2014**



Source: IMF World Economic Outlook Database, April 2016.

An even bigger difference in relative but not in absolute terms is recorded in Canada. Canadian general government net debt amounts approximately to one third of its gross debt (a difference of almost 60 percentage points of GDP). The difference is also substantial (approximately 20 percentage points of GDP or more) in Austria, Belgium, Spain, the US, Italy and Ireland.

**Among the highly-indebted advanced economies, the difference between general government gross and net debt is biggest in Japan.**

Using net debt instead of gross debt has both advantages and disadvantages. It seems conceptually and methodologically correct to take into consideration both sides of the government's balance sheet, but net public debt is not always easily measurable because of incomplete statistics on public financial assets<sup>8</sup>. Nor does net public debt provide a complete picture of current and future sovereign solvency because of the varying quality and liquidity of public financial assets. In particular, government pension assets are illiquid by definition, while loans to other countries are often granted based on political rather than economic criteria and are therefore hardly recoverable.

It is worth noting that the general government net debt-to-GDP measure does not include government nonfinancial assets such as real estate, public sector enterprises, government shares in commercial companies, natural resources and license rights. The market values of these can be substantial if well managed<sup>9</sup> and proceeds from their sale (privatisation) can reduce both gross and net public debt.

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## 5 Public liabilities not included in the definition of public debt

### 5.1 General remarks

Despite the broadening of the definition of public debt in the IMF Government Finance Statistics Manual 2001 (GFS 2001) and European System of National and Regional Accounts (ESA 2010) accounting frameworks<sup>10</sup>, some government liabilities remain outside the statistics, for example unfunded public pension, healthcare and long-term care liabilities, and contingent liabilities related to the financial sector.

To close the gap between funded and unfunded liabilities, at least partly, GFS 2001 recommends the preparation by governments of separate statements on the explicit contingent liabilities not included in the current public debt statistics (such as one-off guarantees) and on unfunded state pension liabilities (GFSM, 2013, chapter 7). The ESA 2010 statistical standards approved by the European Parliament and Council of the EU in May 2013, which are being gradually implemented, take a further step. Apart from a separate statement on the implicit liabilities of the state pension system (ESA 2010, 2013: para. 17.121 and subsequent paragraphs; ESA 2010, 2016, Chapters I.3 and III.6) the standards oblige governments to reflect in public debt statistics changes to pension systems that influence the levels of future implicit public liabilities (see section 5.2).

Unfunded pension, healthcare and long-term care liabilities differ from 'standard' debt instruments in terms of their liquidity and the way they are financed. They do not need to be rolled over on the market but must be paid down in future budget periods, including the costs of their servicing (when they are subject to indexation). Therefore, they add to future expenditure streams. If these liabilities increase, future public pension, health and long-term care expenditure will increase respectively (and vice versa).

Implicit liabilities related to the financial sector have a contingent character. That is, under an optimistic assumption of perfect financial stability, they can be never called in. However, once called in, they must be paid down immediately to avoid a systemic disruption of the financial sector.

8 For the highly-indebted advanced economies analysed in this paper, the IMF World Economic Outlook Database does not provide general government net debt statistics for Cyprus, Singapore and Slovenia.

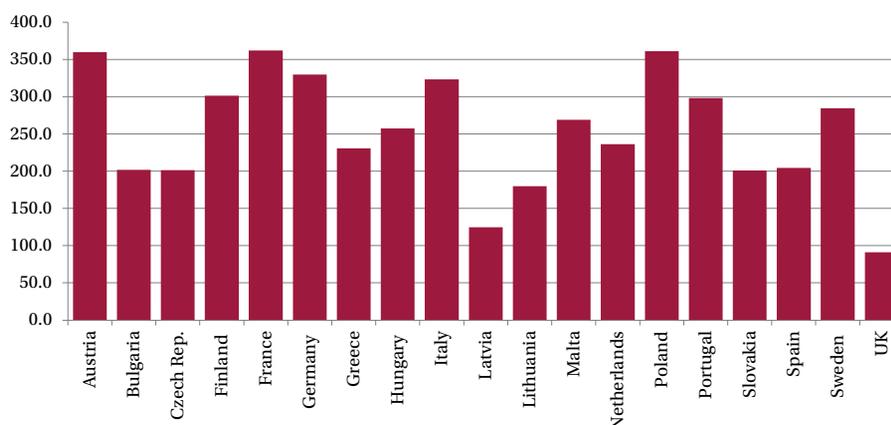
9 See Detter and Foelster (2015) on the management of public assets.

10 See <https://www.imf.org/external/pubs/ft/gfs/manual/> and <http://ec.europa.eu/eurostat/web/esa-2010>.

## 5.2 Unfunded pension liabilities

Implicit or unfunded pension liabilities originate from the specific design of public pension systems based on an intergenerational contract: the pensions of current pensioners are funded by pension contributions or taxes paid by the currently employed (the pay-as-you-go, or PAYG, system). Consequently, a substantial implicit pension debt from the unfunded pension scheme is created (Kane and Palacios, 1996).

**Figure 5: Implicit pension liabilities in EU member states, 2006 (in percent of GDP, projected benefit obligations)**



Source: Mueller, Raffelhueschen and Weddige (2009), Figure 50.

There is no single methodology to estimate implicit pension liabilities<sup>11</sup>. Mueller, Raffelhueschen and Weddige (2009), in a study commissioned by the European Central Bank that offers the most comprehensive and cross-country comparable estimation to date for 19 EU countries, focused on the accrued-to-date liabilities, ie the obligations that would have to be paid if the systems were phased out immediately. As result, the authors used the projected benefit obligation method of estimating implicit pension liabilities (Figure 5).

In all cases, these estimates exceeded the level of official general government gross debt in the mid-2000s (Figure 5 and Table 1) by considerable margins and were often several times the gross debt level. Since the estimates were made, the levels of implicit public debt have likely changed because of updated demographic forecasts and pension reforms, such as changes to statutory and actual retirement ages.

In its 2015 *Aging Report*, the European Commission (2015) does not offer an implicit pension debt projection but estimates changes in future public pension expenditure, which can be considered as the cost of redemption and servicing of unfunded pension liabilities. If this expenditure item increases it will suggest increased implicit pension debt and vice versa. A projected increase in public pension expenditure means that additional fiscal adjustment will be necessary beyond the figures estimated in Simulations 1-2 (section 3), all other things being equal. Alternatively, an expected reduction in public pension expenditure gives more room for fiscal manoeuvre.

As Figure 6 shows, several EU countries are on the way to halting the rapid growth of public pension expenditure (and, consequently, future pension liabilities) that was observed in the 1990s and 2000s and was caused by population aging. This is a consequence of pension reforms carried out in the 2000s and 2010s, which increased retirement ages, reduced pension privileges for certain sectors and professional groups, improved pension contribution payment discipline, and cut the average pension to average wage ratio (ie the replacement

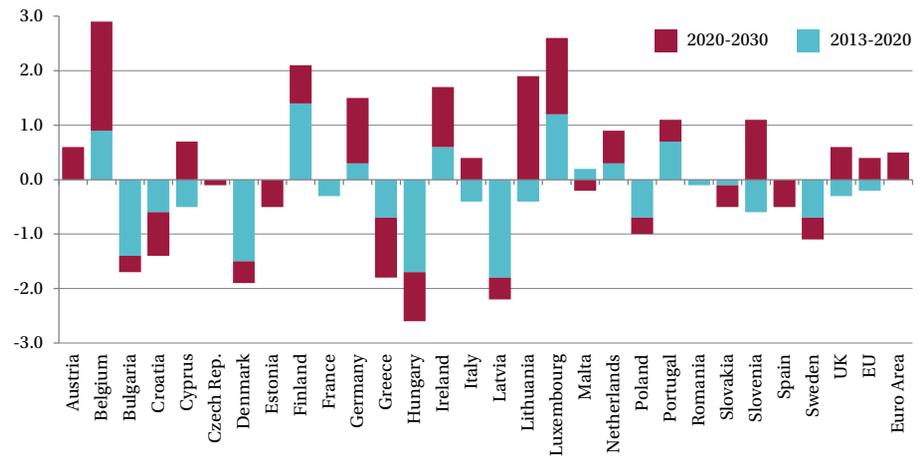
<sup>11</sup> See Beltrametti and Della Valle (2011) for a conceptual and methodological discussion on the nature of pension debt and its measurement.

ratio). Transitioning from defined benefits systems to defined contribution systems reduced or at least stopped further increases in the replacement ratio and created an incentive for later retirement and better payment discipline.

However, according to European Commission (2015), not all countries have managed so far to curtail the expected increase in public pension expenditure. Others have stabilised their pension spending at a relatively high level, and in some cases the positive effects of past reforms will expire soon. Among the highly-indebted countries, Belgium, Ireland, Portugal, Cyprus, Slovenia, the UK, Italy, France and Austria should undertake further reforms, as should less-indebted Germany, Finland, Luxembourg, Netherlands, Malta and Lithuania.

**Figure 6: Changes in gross public pension expenditure, 2013-30 (percent of GDP)**

**Several EU countries are on the way to halting the rapid growth of public pension expenditure that was observed in the 1990s and 2000s and was caused by population aging.**



Source: European Commission (2015), Table II.1.14.

Apart from reforming public pension systems themselves (along the lines elaborated above), raising labour market participation rates (especially for women) and encouraging legal labour immigration will also help to reduce future liabilities. In all countries, politicians should avoid the populist temptation to reverse or soften reforms adopted to date.

Mueller, Raffelhueschen and Weddige (2009) and European Commission (2015) do not cover non-EU advanced economies such as the US, Japan and Canada. However, earlier cross-country comparative analyses (eg Chand and Jaeger, 1996) suggest that their implicit public pension debts are probably lower than in Europe because of the greater role of funded pension schemes.

The absence of public pension liabilities in public debt statistics distorts the picture of sovereign indebtedness and also creates negative incentives in terms of pension reform. For example, when the fiscal situation in many countries sharply deteriorated in the aftermath of the global financial crisis, some decided to reverse the earlier second-pillar pension reforms (mandatory funded public pension schemes) and transfer pension fund assets and liabilities back to the PAYG system. Such measures were taken, for example, by Argentina, Hungary and Poland and, to a lesser extent, by other central and eastern European countries (Barbone, 2011; Jarrett, 2011). For these countries, official data on general government deficit and debt in accordance with GFS 2001 and ESA95 (the predecessor of ESA 2010) shows improvement, but implicit pension liabilities have increased. However, the new ESA 2010 reporting standards will make such practices of ‘creative’ fiscal accounting more difficult because the effects of institutional changes in public pension systems will have to be at least partially reflected in fiscal statistics.

### 5.3 Public healthcare and long-term care liabilities

Implicit fiscal (intergenerational) liabilities also exist in the public healthcare and long-term care systems. The mechanism is similar to that of the public pension system, though the amount of contingent liabilities is more difficult to determine for many policy and technical reasons.

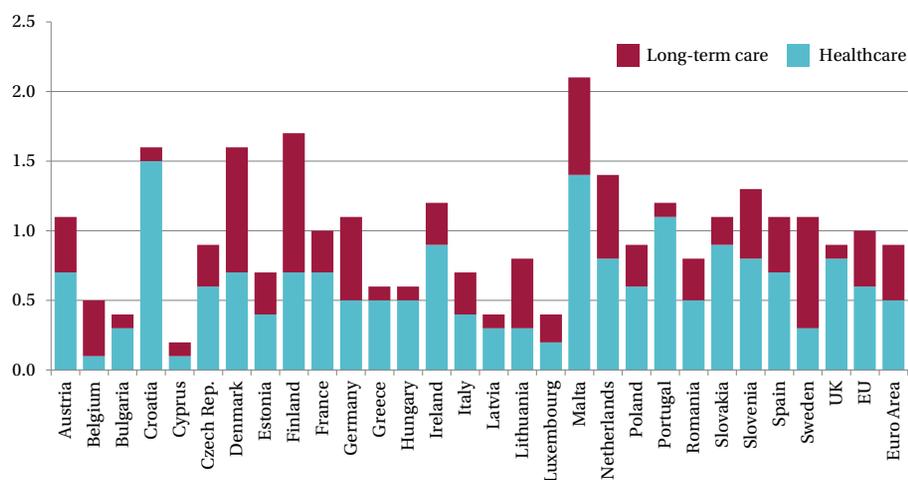
Present-day taxpayers pay mandatory contributions to public medical insurance funds (or in the form of general taxes) and most will require health and long-term care services in the last years of their lives. Negative demographic trends and population aging contribute to increased hidden debts. Technological progress in medical services and the related increase in costs also contribute to the growth of future public healthcare and long-term care liabilities.

Obviously, liabilities related to the public healthcare and long-term care systems are not as precisely determined as public PAYG pension system liabilities. Governments have some room for manoeuvre in the organisation of public healthcare and long-term care services and factors such as their cost management, determining individual entitlements, co-payments and contributions/tax rates (for example, elimination of various group privileges) (Clements *et al*, 2011). Estimates of implicit liabilities will therefore depend on detailed assumptions and the calculation method used.

One example covering a larger group of countries is Medearis and Hishov (2010) who calculated implicit public healthcare liabilities for EU countries and the US by extrapolating the so-called 'health care fiscal sustainability gap', defined as the difference between real annual growth in per-capita health spending (over the period 2000-08) and real annual growth in per-capita GDP for the period of 25 years ahead.

Their results vary substantially: from 20 percent of GDP (Hungary) to over 500 percent of GDP (Luxembourg). Interestingly, liabilities in the US public healthcare system (which provides only limited coverage) exceeded 200 percent of GDP. In many EU countries, the situation looked even worse: in Denmark, France, the Netherlands and Spain, public healthcare liabilities exceeded 200 percent of GDP; 300 percent of GDP in Poland and Sweden; and 400 percent of GDP in Finland, Ireland and Slovakia.

**Figure 7: Changes in public health and long-term care expenditure, 2013-30 (percent of GDP), demographic scenario**



Source: European Commission (2015), Tables III.1.102 and III.1.114.

Medearis and Hishov (2010) used a debatable method that focused on extrapolation of past cost trends rather than on demographic factors. Nevertheless, their results suggest that unfunded public healthcare liabilities are substantial. In some countries, they exceed unfunded pension liabilities.

European Commission (2015) estimated only future changes in public healthcare and long-term care expenditure, similarly to public pension expenditure. For the purpose of our analysis we choose the so-called demographic scenario, which presents the consequences of demographic changes only (Figure 7) and disregards other potential factors such as the impact of technical progress on the costs of medical services. All EU countries will record increases in public health and long-term care spending by 2030, which is not the case for public pension systems. For the entire EU, the magnitude of this increase will be twice the pension expenditure increase. The biggest challenges will be faced by Malta, Finland, Denmark, Croatia, Netherlands, Germany and Slovakia, and by highly-indebted Slovenia, Ireland, Portugal, Spain, Austria and France.

Again, the expected increase in future public health and long-term care spending will require additional fiscal adjustment beyond the estimates of Simulations 1-2, all other things being equal.

#### 5.4 Contingent liabilities related to financial stability

The functioning of the fractional-reserve banking system might result in banking crises from time to time. To avoid a banking panic, the collapse of the financial system, the spread of crises to other countries and adverse shocks to the real economy, governments often decide to support insolvent banks, for example, by replenishing their capital or purchasing their problematic assets. Occasionally, several years later, these expenditures can be at least partly recovered through the privatisation of banks nationalised during the crisis or by cashing in assets taken over during a crisis.

Differently from public pension, healthcare and long-term care systems, government liabilities related to the financial sector have undeclared (implicit)<sup>12</sup> and potential (contingency) character. Their realisation depends on the probability of a financial crisis and its potential scale and consequences.

The potential magnitude of those liabilities depends on many factors, such as the ratio of bank assets to GDP (the higher the ratio, the greater the potential liabilities), the structure of the banking sector (a concentration of banks increases the risk of a systemic banking crisis), its ownership structure (state ownership increases the risk of crisis; the same pertains to private ownership if the bank is involved in related lending), and the quality of banking legislation, regulation and supervision.

The adverse fiscal consequences of bank crises are usually considerable, which has been confirmed by the global and European financial crises. One can distinguish between (1) direct fiscal costs of government intervention (eg recapitalisation of banks, asset purchases and asset guarantees) and (2) overall fiscal costs of banking crises as measured by changes in the public debt-to-GDP ratio (Amaglobeli *et al.*, 2015). For purpose of our analysis (estimation of implicit fiscal liabilities) the first (narrower) concept seems to be more appropriate.

Laeven and Valencia (2012, Table A2) estimated gross and net direct fiscal costs of policy responses to systemic banking crises for the period 2007-11, which covered the first phase of the global financial crisis and the early part of the European financial crisis<sup>13</sup>. Gross direct fiscal outlays involve government expenditure for bank recapitalisation and asset purchases. Net fiscal outlays are equal to the difference between gross outlays and amounts recovered.

The highest gross fiscal outlays were recorded in Iceland (44.2 percent of GDP), Ireland (40.7 percent of GDP), Greece (27.3 percent of GDP), the Netherlands (12.7 percent of GDP) and the UK (8.8 percent of GDP). However in Iceland, the Netherlands and the UK, part of the government support was recovered, so the net outlays in the analysed period amounted to 20.5, 5.6 and 6.6 percent of GDP, respectively.

12 There are also explicit contingent liabilities, especially those related to the deposit insurance system, which although formally self-funded (from bank contributions), often needs fiscal backstopping.

13 The analysed time span left out the later stages of banking crises in Greece, Spain, Cyprus and Slovenia.

**The adverse fiscal consequences of bank crises are usually considerable, which has been confirmed by the global and European financial crises.**

These amounts have been already included in the official general government debt-to-GDP statistics of the respective countries. They do not necessarily indicate the size of future government liabilities in respect of the financial sector. One can hope that the new set of financial regulations and institutions introduced in response to the global and European financial crises (including EU banking union and the bail-in principle in case of bank insolvency) make large-scale crises less likely and reduce taxpayers' potential contribution to their resolution. On the other hand, the current prolonged period of record-low (in some instances, negative) nominal interest rates, slow economic growth and increasing public indebtedness can create new risks.

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## 6 Potential negative spillovers

Fast growth of sovereign debt in advanced economies can have negative economic, social and political consequences. In this section, we concentrate on two of these: financial stability risks and the negative impact on economic growth.

### 6.1 Financial stability risk

In section 5.3 we analysed the adverse fiscal consequences of systemic banking crises. However, the sovereign-bank loop can also work in the opposite direction: problems with sovereign solvency will negatively affect banking systems and the entire financial sector as a substantial holder of government debt instruments. The banking crises in Greece (2010-13 and again in 2015-16) and in Cyprus (2012-13) – in both cases the result of excessive exposure of banks to Greece's sovereign debt – well illustrate this danger. Several banking crises in emerging-market economies in the 1980s and 1990s (for example, Argentina, Mexico, Brazil, Russia, Ukraine and Turkey) also had their roots, at least partly, in public debt crises.

Bruegel's database developed by Merler and Pisani-Ferry (2012) shows that some euro-area countries have high exposure to marketable sovereign debt held by deposit banks. In 2011, this exposure amounted to 20.8 percent of GDP in Portugal, 16.9 percent of GDP in Italy, 16.1 percent of GDP in Greece, 15.9 percent of GDP in Spain, 15.7 percent of GDP in Germany and 9.6 percent of GDP in Ireland. Banks in other countries, in particular in the US, UK, France and the Netherlands, were less exposed.

The updated database<sup>14</sup> shows only the percentage of total marketable debt held by domestic deposit banks and does not give explicit bank exposure to public debt measured in percent of GDP at the end of 2015. However, the rapid expansion of debt-to-GDP ratios and domestic banks' shares of government bond markets mean that this exposure has increased in most analysed countries since 2011. This is the case in, in particular, Ireland, Greece, Italy, Spain and, most probably, Portugal<sup>15</sup>. Furthermore, because of the national fragmentation of the euro-area financial market as a result of the European financial crisis, the home-country bias has increased (Merler, 2014), meaning less cross-border sovereign exposure (and therefore risk sharing) and an even stronger reliance by domestic banks on fiscal consolidation in highly-indebted countries.

The Bruegel database does not include Japan. However, according to the IMF (2016b, Table 2), in 2015 net credit to the nonfinancial public sector in Japan accounted for approximately half of the net domestic assets of depository corporations and this ratio has remained pretty stable over recent years. In relative terms, it amounted to 114.3 percent GDP in 2015. At the same time, the Bank of Japan's net credit to the non-financial public sector quadrupled

<sup>14</sup> The Bruegel database of sovereign bond holdings developed by Merler and Pisani-Ferry (2012); update of May 2016, see [http://bruegel.org/wp-content/uploads/2015/06/201605\\_Bruegel\\_sovereign\\_bond\\_holding\\_dataset-1.xlsx](http://bruegel.org/wp-content/uploads/2015/06/201605_Bruegel_sovereign_bond_holding_dataset-1.xlsx).

<sup>15</sup> The data series for this country ends in 2013.

between 2011 and 2015 (reaching 57.8 percent of GDP in 2015), which suggests an increasing pace of *de-facto* public debt monetisation by the Japanese monetary authority (formally this is the result of the policy of quantitative easing conducted by the Japanese central bank).

In addition to increasing commercial banks' sovereign exposures, sovereign debt instruments (at least the ones issued by the governments in leading advanced economies) have other important functions that are based on the assumption of their risk-free character. There is, for example, their role as collateral in central bank lending to commercial banks, central bank international reserve assets, reserve assets of sovereign wealth funds, life insurance companies, pension funds and other investment funds, and as liquidity instruments in daily financial market operations. Greece's recent sovereign debt crisis demonstrated its far-reaching disruptive consequences not only for the domestic and euro-area financial sectors, but also for the European Central Bank's monetary policy operations. It is hard to predict the scale of potential negative effects in case of public debt sustainability problems in larger countries such as Japan, Italy, France or the UK.

## 6.2 Potential negative impact on economic growth

Several empirical analyses (eg Checherita and Rother, 2010; Reinhart and Rogoff, 2010; Kumar and Woo, 2010; Cecchetti, Mohanty and Zampolli, 2011) confirm that the negative impact of public debt on economic growth follows a non-linear pattern. That is, when the debt-to-GDP level is low or moderate, it is difficult to detect such a negative impact. However, the impact becomes visible once the debt-to-GDP ratio exceeds a certain high threshold, for example, 80 or 90 percent.

According to Checherita and Rother (2010), there are four channels through which this negative impact can materialise: (i) private saving, (ii) public investment, (iii) total factor productivity (TFP), and (iv) sovereign long-term nominal and real interest rates. In a similar vein, Ostry, Gosh and Espinoza (2015, p.5) argue that "*inherited public debt represents a dead-weight burden on the economy, reducing both investment potential and growth prospects*" [...] via "*...the present value of the distortionary costs of the taxation needed to service the debt*".

Ardagna, Caselli and Lane (2007), Kinoshita (2006) and several other studies (see IMF, 2013 for an overview) also confirm that high public debt has a non-linear impact on long-term real interest rates. This means not only the risk of a fiscal vicious circle leading, in extreme cases, to sovereign insolvency, but also higher financing costs for business and, therefore, slower growth.

Thus high public debt adds to the already existing supply-side barriers in advanced economies, such as shrinking working-age populations, stagnating investment (Dabrowski, 2013) and lower TFP growth (Gordon, 2016).

On the demand side, rapidly expanding public debt can create various kinds of uncertainties, such as fear of higher future taxation or risk of sovereign default and associated financial crisis and can, therefore, harm consumers and investment spending. Thus one can expect more Ricardian than Keynesian effects of fiscal expansion when public debt is high.

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# 7 Policy conclusions and recommendations

It is time to reassess the approach to the fiscal policy stance and continuous expansion of public debt in advanced economies. As this analysis demonstrates, without improving primary fiscal balances the sustainability of public debt, at least in some of advanced economies, can be put into question, especially if current GDP growth rates decline or real interest rates go up (which could happen as a result of any new economic or political shock). In this context, calls for further fiscal stimulus need to be balanced against the negative consequences of explosive debt dynamics.

Waiting for 'better times' for fiscal adjustment is a risky strategy because the interest rate-growth differential might deteriorate in comparison with the rather favourable situation in 2015. Real interest rates, which are now at a historically low level as result of extremely accommodative monetary policy, at least in the euro area and Japan, might increase at some point. Growth rates are also unlikely to pick up soon and, in some countries, they could further deteriorate as a result of the looming demographic crisis.

Interestingly, the IMF, which backed countercyclical fiscal policies in advanced economies in the wake of the global financial crisis and then warned against premature fiscal tightening, seems to be changing its attitude. While Ostry, Ghosh and Espinoza (2015) still argued against 'deliberate' paying down of debt by countries with 'ample fiscal space' (because the distorting costs of reducing debt would exceed expected crisis-insurance benefits) and opted for 'organic' reduction of debt-to-GDP ratios via growth and through the use of 'less distortionary sources of revenue' (as compared to raising taxes) when available, Escolano and Gaspar (2016) went a step further and advocated a policy of 'gradual smooth reduction in the debt-to-GDP ratio'.

Indeed this might be an optimal strategy to tackle the excessive debt burden, although what 'gradual' means requires clarification. Some countries must adjust faster or at least more significantly. These include Japan, Italy, Cyprus and Portugal. In all cases fiscal consolidation should be supported by comprehensive structural and institutional reforms that aim to both improve future growth potential and reduce future fiscal liabilities (explicit and implicit). Other highly indebted countries have a bit more room for manoeuvre and can move more gradually.

All countries should reduce their debt levels when one-off fiscal opportunities arise, such as windfall gains or disposal of government assets (privatisation proceeds, auctioning of telecommunication spectrum or selling natural resource licenses), especially when privatisations are expected to lead to efficiency gains that increase the value of the assets.

Methodological effort to consolidate and broaden public debt statistics should be continued, especially through the inclusion of long-term unfunded public pension, healthcare and long-term care liabilities.

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