

## CHAPTER 3

### THE EFFECTIVENESS AND SCOPE OF FISCAL STIMULUS

#### Introduction and summary

*Discretionary fiscal action is at the forefront of the policy agenda*

Discretionary fiscal stimulus is playing an important role in OECD countries' policy response to boost demand in the wake of the financial crisis. This reflects the severity of the downturn, both in terms of depth and duration, combined with the limits of monetary policy, both because the room for additional interest rate cuts is becoming increasingly slim in many OECD countries and especially because monetary transmission channels may be impaired.

*The focus here is on the macro stabilisation objective of fiscal policy*

The focus of this chapter is on the use of fiscal policy for short-term macroeconomic stabilisation objectives, although other aims such as enhancing long-term growth, as well as social objectives such as cushioning the effect of the downturn on households or environmental objectives should also be pursued. The chapter documents the fiscal policy measures introduced in response to the crisis on the basis of cross-country comparable data, evaluates the effectiveness of fiscal measures in boosting activity, assesses the costs and benefits of further fiscal action and considers issues related to the timing of any fiscal stimulus.

The main findings with respect to crisis-related fiscal measures already announced can be summarised as follows:

*Most countries have taken fiscal measures, but there is wide variation in size*

- Virtually all OECD countries have introduced discretionary measures in response to the crisis, though the crisis-driven stimulus packages represent only one among other influences boosting budget deficits. In most countries, these other factors, which include so-called automatic stabilisers and discretionary easing unrelated to the crisis, account for the largest part of the run-up in debt over the period 2008-10. There is considerable cross-country variation in the scale of crisis measures introduced. For the average OECD country carrying out a stimulus package, their cumulated budget impact over the period 2008-10 amounts to more than 2½ per cent of GDP, with the United States having the largest fiscal package at about 5½ per cent of 2008 GDP.

***Fiscal multipliers may be reduced in the current conjuncture***

- A review of the available evidence suggests that, under normal circumstances, fiscal multipliers may be around unity for government spending and about half that for tax measures, although with lower multipliers for more open economies. However, in the current conjuncture the propensity of households and businesses to save has likely increased, so reducing multipliers, particularly for tax cuts.
- For the average OECD country, such multipliers suggest that the level of support from discretionary stimulus to GDP both in 2009 and 2010 will be of the order of ½ per cent. Only for the United States and Australia will the estimated multiplier effect clearly exceed 1% of GDP in both 2009 and 2010. These effects do not include cross-border spillovers.

***The size of fiscal packages varies inversely with automatic stabilisers***

- There is an inverse correlation between the size of discretionary fiscal packages announced/implemented among OECD countries and the strength of so-called automatic stabilisers. Overall, the size of the latter is typically three times that of the former.

Countries differ in terms of the relative costs and benefits they face from additional stimulus. The main findings are as follows:

***Countries differ in their scope for further action***

- Whether a more ambitious fiscal stimulus than currently planned is appropriate depends on country-specific circumstances. Evidence shows that adverse reactions in financial markets are likely in response to higher government debt and that such reactions may depend on the initial budget situation. For countries which are identified as having a weak initial fiscal position -- including Japan, Italy, Greece, Hungary, Iceland and Ireland -- the room for fiscal expansion is limited. Other countries differ in terms of the costs and benefits of further stimulus. For some, further action to cushion the projected downturn seems warranted. Countries with most scope for fiscal manoeuvre appear to be Germany, Canada, Australia, Netherlands, Switzerland, Korea and some Nordic countries. For others, action would only be warranted in case activity looks to turn out even weaker than projected.

***Design of packages is important with respect to instrument ...***

- The design of additional fiscal packages in terms of individual components will be crucial in maximising their effectiveness. The largest short-run impact on aggregate demand is likely to come from government spending measures, but where tax cuts are implemented they are most effective if targeted at households that are likely to be liquidity-constrained. Complementary criteria for selecting individual measures are those which are both most likely to raise aggregate demand in the short run as well as aggregate supply in the long run, including: increased public spending on

infrastructure; increased spending on active labour market policy, including on compulsory training courses; and reduction of personal income taxes, notably on low-income earners.

*... and timing*

- In practice, and outside the G7, a majority of countries have given priority to tax cuts over boosting spending, although Australia is a clear exception. G7 countries are more balanced in this respect. The reason for the relative weight on tax cuts may be the ease of implementation of such measures. Timing issues are also key in respect of the fiscal stimulus. To the extent that the output gap widens further into 2010, as in the OECD projections, those countries that have scope for further action, should consider boosting the stimulus in 2010.

*Fiscal stimulus may be more effective within a framework ensuring its scaling back*

- For the typical OECD country, however, the level of fiscal stimulus falls off significantly in 2010 compared to 2009, although there are exceptions where the packages are broadly maintained through 2010 (United States, Finland, Germany and Canada) or increase in 2010 (Denmark and Slovak Republic). Fiscal stimulus is likely to be more cost effective if accompanied by credible commitments to scale it back or even reverse it as the recovery gains traction. This underlines the importance of strengthening medium-term fiscal frameworks for ensuring fiscal sustainability.

*Co-ordination is hard to put into practice*

- Fiscal stimulus will have international spillovers both through trade and interest rate channels. Smaller countries perceive only part of the global benefit provided by their action; larger countries perceive only part of the costs involved. This suggests a role for international co-ordination, while taking into account each country's scope for fiscal action. In practice this may be difficult to achieve and swiftness of action should be given the priority.

### **Fiscal measures in response to the crisis**

*Discretionary measures need to be put in context of massive fiscal changes*

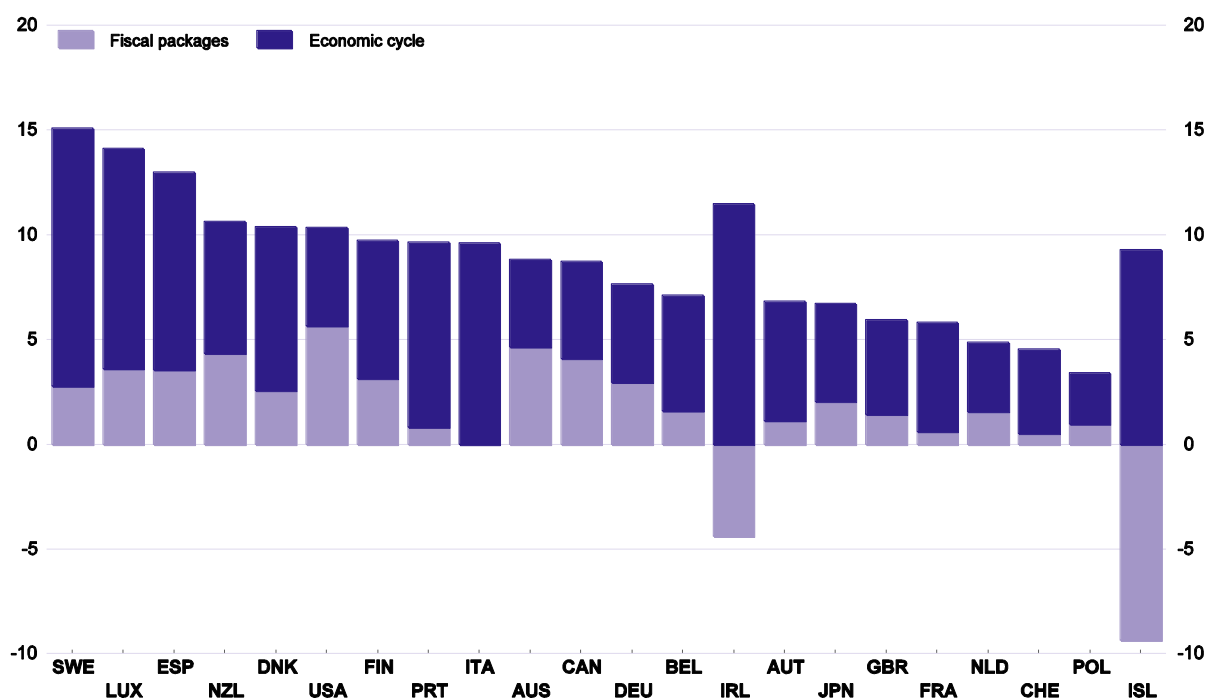
Discretionary fiscal policy actions in response to the crisis need to be seen in the context that the area-wide deficit is projected to widen from around 1½ per cent of GDP in 2007 to nearly 9% in 2010, with gross government debt increasing from about 75% of GDP to about 100%. Most of this increase can be related to a cyclical effect due to the operation of automatic stabilisers in the deep downturn (Figure 3.1) and which, for the average OECD country, have a fiscal balance effect over the period 2008-10 which is about three times the discretionary fiscal action currently planned by governments in response to the crisis.<sup>28</sup> Revenues had been

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28. This is a calculation of the unweighted average across those OECD countries taking positive stimulus measures. Only in the United States and Australia does the discretionary fiscal action exceed the automatic fiscal stabilisers.

**Figure 3.1. Automatic and discretionary fiscal impulse in response to the crisis**

Impact on fiscal deficits cumulated over the period 2008-2010, as a per cent of 2008 GDP



Note: Fiscal packages are as described in Appendix 3.1. The impact of the economic cycle is derived as the sum of the cyclical components of fiscal balances over the period 2008-2010. Not included are: effects linked to the initial net lending position; discretionary measures which were not decided in response to the crisis, even if they are implemented over the period 2008-2010; discretionary measures related to the crisis that have no direct impact on fiscal balances measured on a national account basis (e.g. change in the timing of payments for taxes and government procurement, investment by public enterprises, as well as loans and purchases of assets by the government); the disappearance of exceptional revenue buoyancy; the effect of the asset cycle on the value of government assets and liabilities, as well as other factors which would have contributed to variations in fiscal balances even in the absence of the crisis (e.g. ageing related fiscal pressures).

Source: OECD.

buoyed in previous years by high asset prices and activity in financial and construction sectors and the disappearance of this extraordinary revenue buoyancy also contributes to the run-up in debt. Finally, a number of countries have undertaken discretionary fiscal easing unrelated to the crisis.

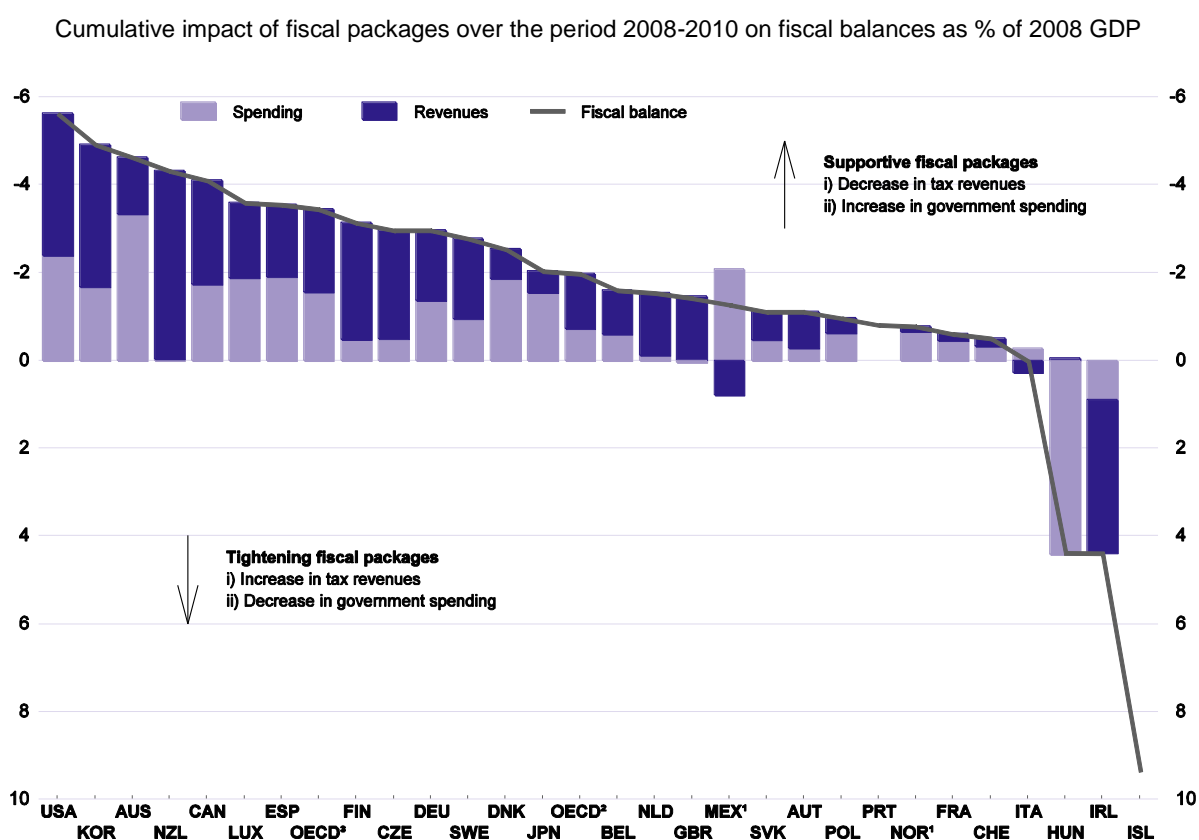
### ***Fiscal packages differ widely in scale across countries***

In addition, virtually all OECD countries have introduced discretionary measures to support the economy in the face of the crisis. Based on a consistent approach to the definition of packages (described in Appendix 3.1), the size of fiscal packages, introduced as a direct response to the crisis and measured by their cumulated impacts on fiscal balances over the period 2008-10, amounts to about 3½ per cent of area-wide 2008 GDP.<sup>29</sup> However, there is considerable variation in the size of packages

29. These data reflect the impact of fiscal packages on fiscal balances and may not reflect all the measures introduced to boost activity. In particular, recapitalisation operations and increases in public enterprises investment are not included. For further details of how the stimulus packages have been identified, see Appendix 3.1. Details of the fiscal responses in each OECD country are available on the OECD Economic Outlook webpage on the OECD website ([www.oecd.org/oecdEconomicOutlook](http://www.oecd.org/oecdEconomicOutlook)).

across countries (Table 3.1 and Figure 3.2), partly reflecting the severity of the economic crisis, the fiscal position before the onset of the crisis and the size of automatic stabilisers. An unweighted average of countries introducing positive stimulus packages implies a typical stimulus package amounting to more than 2½ per cent of GDP over the period 2008-10. But five countries (Australia, Canada, Korea, New Zealand and the United States) have introduced fiscal packages amounting to 4% of 2008 GDP or more, the US package -- at about 5½ per cent of 2008 GDP -- being the largest. In contrast, a few countries (in particular Hungary, Iceland and Ireland) are expected to drastically tighten their fiscal stance.

**Figure 3.2. The size and composition of fiscal packages**



Note: See notes to Table 3.1.

1. Only 2008-2009 data are available for Mexico and Norway.
2. Simple average of above countries except Greece, Iceland, Mexico, Norway, Portugal and Turkey.
3. Weighted average of the above countries excluding Greece, Iceland, Mexico, Norway, Portugal and Turkey.

Source: OECD.

**Measures changing the timing of payments are not included in these estimates**

An important qualification to these estimates of the size of discretionary packages is that they record fiscal measures on a national-accounts (*i.e.* accrual) basis, so that measures based on changing the timing of payments, such as bringing forward government payments or allowing

Table 3.1. The size and timing of fiscal packages

	2008-2010 net effect on fiscal balance <sup>1</sup>			Distribution over the period 2008-2010			Memorandum item: Measures affecting the timing of payments <sup>2</sup>
	Spending	Tax revenue	Total	2008	2009	2010	
	Per cent of 2008 GDP			Per cent of total net effect			Per cent of 2008 GDP
Australia	-3.3	-1.3	-4.6	15	54	31	
Austria	-0.3	-0.8	-1.1	0	84	16	
Belgium	-0.6	-1.0	-1.6	0	60	40	-0.1
Canada	-1.7	-2.4	-4.1	12	41	47	
Czech Republic	-0.5	-2.5	-3.0	0	66	34	..
Denmark	-1.9	-0.7	-2.5	0	33	67	..
Finland	-0.5	-2.7	-3.1	0	47	53	
France	-0.4	-0.2	-0.6	0	75	25	-0.5
Germany	-1.4	-1.6	-3.0	0	46	54	
Greece	..	..	..	..	..	..	
Hungary	4.4	0.0	4.4	0	58	42	
Iceland	..	..	9.4	0	33	67	
Ireland	0.9	3.5	4.4	15	44	41	0.3
Italy	-0.3	0.3	0.0	0	15	85	
Japan	-1.5	-0.5	-2.0	4	73	24	
Korea	-1.7	-3.2	-4.9	23	49	28	
Luxembourg	-1.9	-1.7	-3.6	0	76	24	0.0
Mexico <sup>3</sup>	-2.1	0.8	-1.3	0	100	..	
Netherlands	-0.1	-1.4	-1.5	0	51	49	..
New Zealand	0.0	-4.3	-4.3	5	46	49	
Norway <sup>3</sup>	-0.7	-0.1	-0.8	0	100	..	
Poland	-0.6	-0.4	-1.0	0	77	23	
Portugal	..	..	-0.8	0	100	0	
Slovak Republic	-0.5	-0.6	-1.1	0	42	58	-0.8
Spain	-1.9	-1.6	-3.5	31	46	23	-1.0
Sweden	-0.9	-1.8	-2.8	0	52	48	..
Switzerland	-0.3	-0.2	-0.5	0	68	32	
Turkey	..	..	..	..	..	..	
United Kingdom	0.0	-1.5	-1.4	15	93	-8	
United States <sup>4</sup>	-2.4	-3.2	-5.6	21	37	42	
Major seven	-1.6	-2.0	-3.6	17	43	40	
OECD averages							
All (unweighted) <sup>5</sup>	-0.7	-1.2	-2.0	10	53	37	
All (weighted) <sup>5</sup>	-1.5	-1.9	-3.4	17	45	39	
Positive stimulus only (unweighted) <sup>6</sup>	-1.1	-1.6	-2.7	9	53	38	
Positive stimulus only (weighted) <sup>6</sup>	-1.7	-2.0	-3.7	17	45	39	

Note: cut-off date for information is 24 March 2009.

- Includes only discretionary fiscal measures in response to the financial crisis. Estimates provided here do not include the potential impact on fiscal balances of recapitalisation, guarantees or other financial operations. They also exclude the impact of a change in the timing of payment of tax liabilities and/or government procurement.
  - Several countries have changed the timing of payment of government procurement and/or tax liabilities. When applying the accrual principle, such measures should not be reflected in the national account data. Still, they affect fiscal balances measures on a cash basis and may have an impact on the economy. They have not been included in the size of fiscal packages.
  - Data not available for 2010.
  - Figures for the United States refer to the federal government. Available information indicates that a few states, including California, have passed restrictive fiscal measures which are not included here.
  - Average of above countries excluding Greece, Iceland, Mexico, Norway, Portugal and Turkey.
  - Average of above countries excluding Greece, Hungary, Iceland, Ireland, Italy, Mexico, Norway, Portugal and Turkey.
- Source: OECD.

of packages. However, a number of countries have introduced measures of this type, as summarised in the final column of Table 3.1. While it is difficult to quantify the effect of such measures on activity, they do have the merit that over a medium-term horizon their fiscal implications may be negligible while they may provide an important short-term stimulus.

***Packages differ across countries by composition...***

Most countries have adopted broad ranging stimulus programmes, adjusting various taxes and spending programmes simultaneously (Table 3.2 and Figure 3.2). A majority of countries have given priority to

**Table 3.2. Composition of fiscal packages**

*Total over 2008-2010 period as % of GDP in 2008*

	Net effect	Tax measures					Spending measures					
		Total	Individuals	Businesses	Consumption	Social contributions	Total	Final consumption	Investment	Transfers to households	Transfers to businesses	Transfers to sub-national government
Australia	-4.6	-1.3	-1.1	-0.2	0.0	0.0	3.3	0.0	2.6	0.8	0.0	0.0
Austria	-1.1	-0.8	-0.8	-0.1	0.0	0.0	0.3	0.0	0.1	0.1	0.0	0.1
Belgium	-1.6	-1.0	-0.3	-0.6	-0.1	0.0	0.6	0.0	0.1	0.5	0.0	0.0
Canada	-4.1	-2.4	-0.8	-0.3	-1.1	-0.1	1.7	0.1	1.3	0.3	0.1	..
Czech Republic	-3.0	-2.5	0.0	-0.4	-0.1	-2.0	0.5	-0.1	0.2	0.0	0.4	0.0
Denmark	-2.5	-0.7	0.0	0.0	0.0	0.0	1.9	0.9	0.8	0.1	0.0	0.0
Finland	-3.1	-2.7	-1.9	0.0	-0.3	-0.4	0.5	0.0	0.3	0.1	0.0	0.0
France	-0.6	-0.2	-0.1	-0.1	0.0	0.0	0.4	0.0	0.2	0.1	0.0	0.0
Germany	-3.0	-1.6	-0.6	-0.3	0.0	-0.7	1.4	0.0	0.8	0.2	0.3	0.0
Greece <sup>1</sup>	..	..	..	..	..	..	..	0.0	0.1	0.4	0.1	0.0
Hungary	4.4	0.0	-0.1	-1.5	1.6	0.0	-4.4	..	0.0	..	..	0.0
Iceland	9.4	..	1.0	..	..	..	..	-1.8	-1.7	-1.7	..	..
Ireland	4.4	3.5	2.0	-0.2	0.5	1.2	-0.9	-0.7	-0.2	-0.1	0.0	0.0
Italy	0.0	0.3	0.0	0.0	0.1	0.0	0.3	0.3	0.0	0.2	0.1	0.0
Japan	-2.0	-0.5	-0.1	-0.1	-0.1	-0.2	1.5	-0.2	0.3	0.5	0.4	0.3
Korea	-4.9	-3.2	-1.4	-1.2	-0.2	0.0	1.7	0.0	0.9	0.1	0.5	0.2
Luxembourg	-3.6	-1.7	-1.2	-0.5	0.0	0.0	1.9	0.0	0.7	1.0	0.2	0.0
Mexico <sup>1</sup>	-1.3	0.8	0.0	0.0	-0.4	0.0	2.0	0.0	1.1	0.3	0.4	0.0
Netherlands	-1.5	-1.4	-0.2	-0.4	0.0	-0.8	0.1	0.0	0.0	0.1	0.0	0.0
New Zealand	-4.3	-4.3	-4.3	0.0	0.0	0.0	0.0	0.1	0.6	-0.6	0.0	0.0
Norway <sup>1</sup>	-0.8	-0.1	0.0	-0.1	0.0	0.0	0.7	0.0	0.3	0.0	0.0	0.3
Poland	-1.0	-0.4	0.0	-0.1	-0.2	0.0	0.6	0.0	1.3	0.1	0.0	0.0
Portugal	-0.8	..	..	..	..	..	..	0.0	0.4	0.0	0.4	0.0
Slovak Republic	-1.1	-0.6	-0.6	-0.1	0.0	0.0	0.5	0.0	0.0	0.0	0.5	0.0
Spain	-3.5	-1.6	-1.6	0.0	0.0	0.0	1.9	0.3	0.7	0.2	0.7	0.0
Sweden	-2.8	-1.8	-1.5	-0.2	0.0	-0.2	0.9	0.7	0.3	0.1	0.0	0.0
Switzerland	-0.5	-0.2	-0.2	0.0	0.0	0.0	0.3	0.3	0.0	0.0	0.0	0.0
Turkey	..	..	..	..	..	..	..	..	..	..	..	..
United Kingdom	-1.4	-1.5	-0.6	-0.1	-0.7	0.0	0.0	0.0	0.1	0.1	0.0	0.0
United States	-5.6	-3.2	-2.4	-0.8	0.0	0.0	2.4	0.7	0.3	0.5	0.0	0.9

Note: See note on Table 3.1.

Total columns are not the sum of columns shown because some components either have not been clearly specified or are not classified in this breakdown.

1. Data not available for 2010

Source: OECD.

tax cuts over boosting spending (although Japan, France, Australia, Denmark and Mexico are clear exceptions). In the United States the balance will shift; in 2008 the stimulus was entirely focused on tax cuts whereas in 2009 about two-thirds will be on spending measures. Tax cuts are concentrated on personal income taxes (Figure 3.3, panel A) in most countries and to a lesser extent on business taxes, the United Kingdom being the main exception with a generalised temporary VAT cut. On the spending side, virtually all OECD countries have launched and/or brought forward public investment programmes. Australia, Poland, Canada and Mexico are projected to be the most pro-active in this domain, with an increase in public investment as a response to the crisis close to 1% of 2008 GDP or more (Figure 3.3, panel B). Transfers to households have often been made more generous in particular for those on low income. A few countries (including the Czech Republic, Japan, Korea, Portugal, Mexico and the Slovak Republic) have also announced larger subsidies to the business sector (Figure 3.3, panel C).

*... and in timing*

On the basis of currently announced measures, the crisis-related fiscal injection is typically expected to be strongest in 2009, although again with some country variation. For several countries (the United States, Finland, New Zealand, Germany and Canada), the sizes of fiscal packages in 2009 and 2010 are broadly comparable, implying a more or less continued pace of fiscal injection into 2010; there are a few countries (notably Denmark) that plan to have significantly larger packages in 2010. On the other hand, for most other countries, the fiscal injection tapers off in 2010.

*Fiscal multipliers are difficult to pin down in the current conjuncture...*

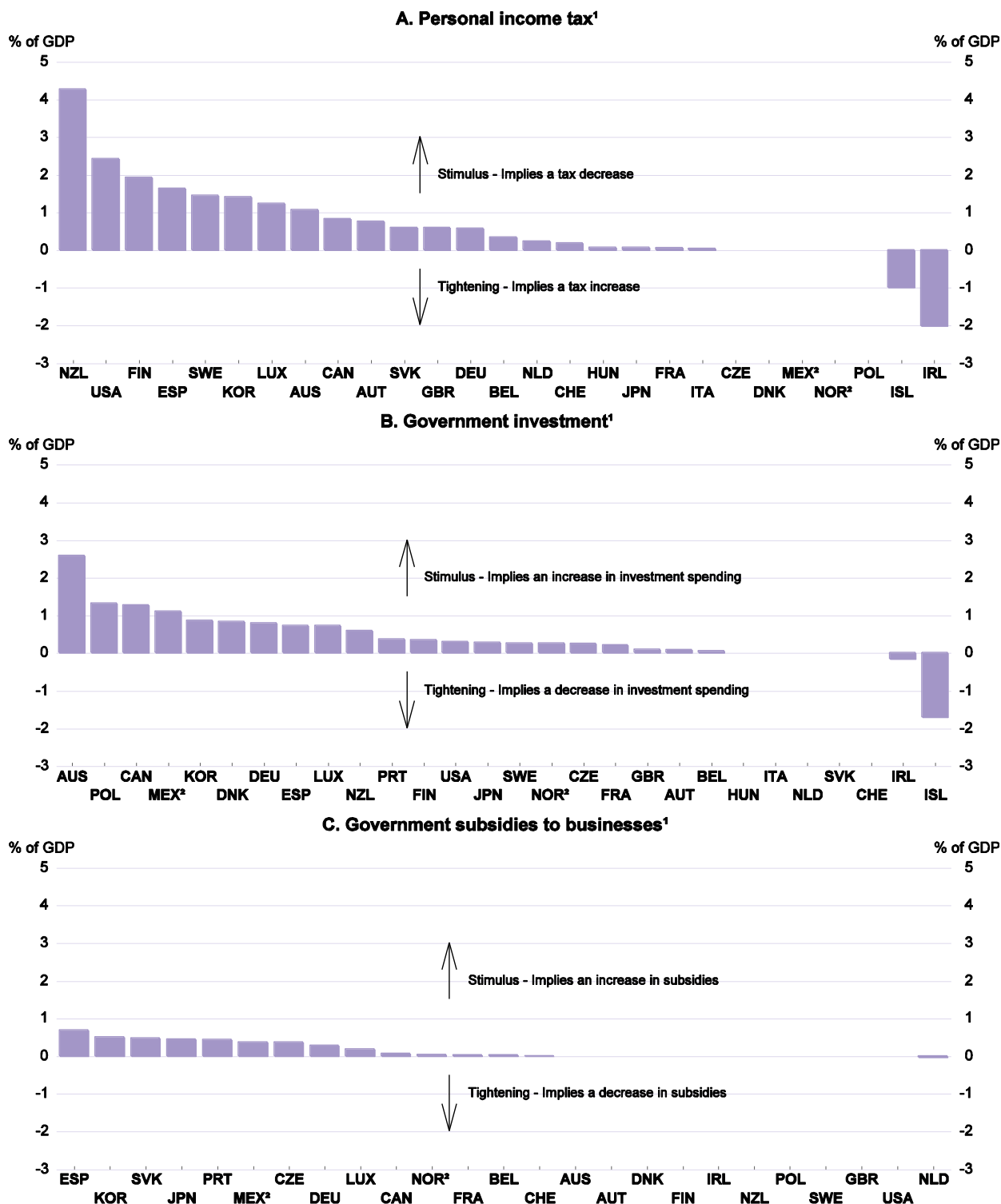
The effectiveness of fiscal policy in boosting activity, measured by so-called fiscal multipliers, is particularly hard to gauge in the current context. A review of the evidence, summarised in Box 3.1, typically suggests a first-year government spending multiplier of slightly greater than unity, with a tax cut multipliers of around half that, with smaller multipliers for more open economies.<sup>30</sup> However, a number of factors, including an impaired functioning of financial markets, heightened uncertainty and the desire of households and business to repair balance sheets as a result of massive capital losses on equity and home values, are likely to alter the fiscal policy effect on economic activity in the current conjuncture. On balance, these factors are more likely to reduce multipliers and accordingly the multipliers used to evaluate current fiscal packages have been judgementally scaled down, and by more for tax cuts than for government spending, to give a “reference” multiplier estimate to distinguish it from the “high” multiplier estimate for which no such adjustment is made (see Appendix 3.2 for further details).

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30. Results from a Dynamic Stochastic General Equilibrium Model appear broadly consistent with these findings (Appendix 3.4).



Figure 3.3. Selected fiscal measures at a glance



1. See notes to Table 3.1.  
 2. Data are not available for 2010.  
 Source: OECD.

### Box 3.1. The size of short-term fiscal multipliers

Fiscal multipliers provide a quantitative summary of the effect of fiscal measures on aggregate activity, expressing the magnitude of the final increase in GDP in a given year in relation to the *ex ante* cost of the measure, thus including not only any 'first round' impact effect of stimulus on output, but also subsequent induced second-round effects. Although there is uncertainty regarding their magnitude, as evidenced by a wide range of estimates, results summarised below are based on an average of simulation results from various macro models surveyed for OECD countries, where only simulations in which monetary policy is set to be accommodative are considered, since these apply better to the current environment.

- Short-run multipliers from increased government spending generally exceed those from revenue measures; direct spending by government does not suffer from leakage to savings at the first round stage and estimated multipliers tend to be slightly higher than 1.0.<sup>1</sup>
- Multipliers from revenue measures are smaller; a personal income tax cut tends to have a slightly larger effect (around 0.5 to 0.8) than other forms of tax cuts (around 0.2 to 0.6).
- The multiplier tends to increase slightly between the first and second years. This is particularly the case for tax measures for which the effects tend to build up more slowly as they feed through the economy indirectly via consumption expenditures.
- Evidence from multi-country models suggests that multipliers are systematically smaller the more open the economy is, an issue considered further below.

#### Range of estimates of short-term fiscal multipliers based on large-scale models

	All studies			Studies with both 1st and 2nd year multipliers					
	Year 1			Year 1			Year 2		
	Low	High	Mean	Low	High	Mean	Low	High	Mean
Purchases of goods and service	0.6	1.9	<b>1.1</b>	0.9	1.9	<b>1.2</b>	0.5	2.2	<b>1.3</b>
Corporate tax cut	0.1	0.5	<b>0.3</b>	0.1	0.5	<b>0.3</b>	0.2	0.8	<b>0.5</b>
Personal income tax cut	0.1	1.1	<b>0.5</b>	0.1	1.1	<b>0.5</b>	0.2	1.4	<b>0.8</b>
Indirect tax cut	0.0	1.4	<b>0.5</b>	0.0	0.6	<b>0.2</b>	0.0	0.8	<b>0.4</b>
Social security contribution cut	0.0	1.2	<b>0.4</b>	0.0	0.5	<b>0.3</b>	0.2	1.0	<b>0.6</b>

*Note:* Models surveyed are National Bank of Belgium Model, Interlink, Deutsche Bundesbank Model, Banca d'Italia model, Banco de Portugal model, Banco de España model, Area-Wide Model, ESRI Short-Run Macroeconometric Model of the Japanese Economy, Department of Finance's Canadian Economic and Fiscal Model, averages of US models as reported by Fromm and Klein 1976, averages of US models as reported by Bryant et al 1988, averages of US models as reported by Adams and Klein 1991 and averages of UK models as reported by Church et al 1993. These models cover United States, Japan, Euro Area, Germany, France, Italy, United Kingdom, Canada, Spain, Belgium and Portugal.

*Source:* Adams and Klein (1991), Bryant (1988), Church et al. (2000), Fromm and Klein (1976), Henry et al. (2004), Roeger and in't Veld (2009) and Perotti (2005).

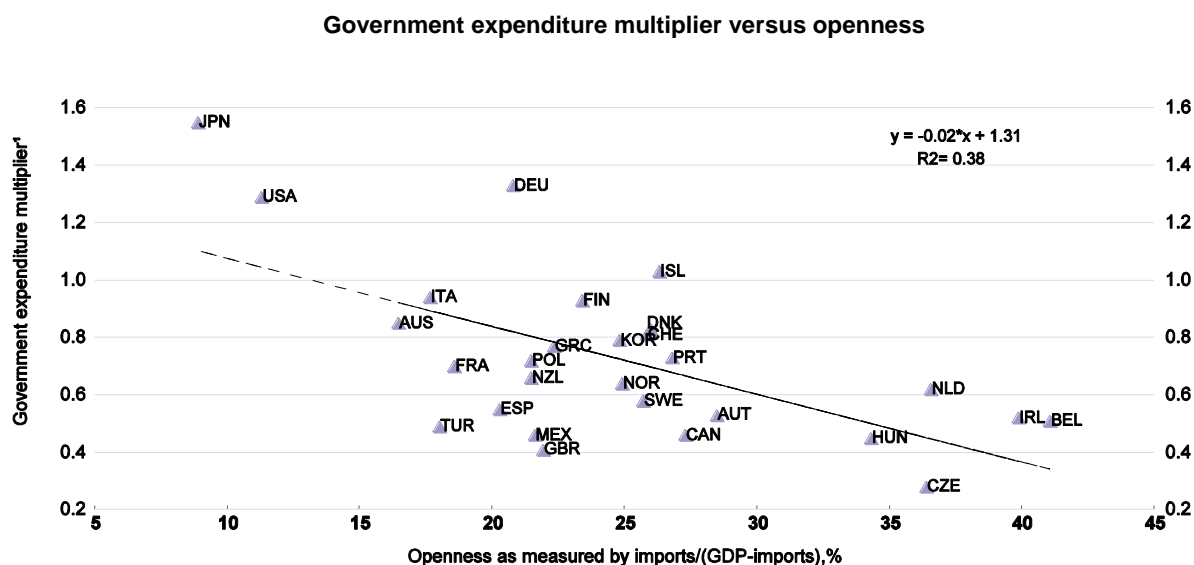
These results are broadly consistent with results from the OECD global model; when monetary policy is accommodative, for large (less open) economies short-term multipliers for government expenditure average around 0.9 in the first year rising to 1.3 in the second year, while for income tax cuts the first year multiplier is 0.6 rising to about 1.0 in the second year.

Two adjustments have been made to the averages of these surveyed results before using them to evaluate current packages: firstly, to allow for differences in the degree of openness across countries, and, secondly, to allow for the unusual circumstances of the current conjuncture.

1. Although models surveyed rarely make a distinction between government investment and consumption, the former may in principle exhibit a higher multiplier due to lower import contents.

Box 3.1. The size of short-term fiscal multipliers (continued)

The more open a country is to trade the more likely that effects of domestic fiscal expansion will leak abroad through imports, so reducing fiscal multipliers. To quantify how the size of multipliers relates to openness, country government expenditure multipliers are compared from a single multi-country model, namely the last (2002) vintage of the OECD's INTERLINK model. A scatter plot of first year multipliers against openness does indeed suggest an inverse correlation between multiplier values and openness. The slope coefficient from this scatter plot has been used as the basis for making cross-country adjustments to the multipliers.



1. From OECD interlink.

Source: OECD.

In the current conjuncture, fiscal stimulus may be *more effective* than under normal circumstances: dysfunctional financial markets mean that more private agents are likely to be credit constrained so that, to the extent that any fiscal stimulus impacts on such agents, a larger portion of any fiscal injection is likely to be spent rather than saved. On the other hand, fiscal stimulus may be *less effective* in the current conjuncture; firstly, faced with heightened risks to employment and income, the desire for precautionary savings may be higher; secondly, in many countries there is a need for households to repair overstretched and damaged balance sheets which implies an increase in the marginal savings propensity. The same holds true for businesses, with uncertainty about the economic outlook combined with the perceived need to hoard cash caused by the dysfunctional financial system, leading to the postponement of investment decisions. Overall, it is judged that on balance such factors are likely to be negative and so the average survey multipliers have been judgmentally adjusted *downwards*. This adjustment is smaller for government spending measures than revenue measures because 'first-round' effects are not affected by changes in private-sector savings behaviour. Although there may be a similar effect on transfers to households, they may be targeted to the credit-constrained, thereby limiting the negative impacts from savings.

These adjustments give rise to 'reference' multiplier estimates for each instrument and country based on the multipliers derived from the survey results adjusted for openness and is further judgmentally reduced to allow for the effect of the current conjuncture. As an alternative, 'high' multiplier estimates are also shown that are adjusted only for openness.

Box 3.1. **The size of short-term fiscal multipliers** (continued)

The multipliers used to evaluate the fiscal packages are set out in the table below, distinguishing five different types of fiscal measure and three representative countries (representing differing degrees of openness). A full tabulation of these multipliers for all OECD countries is given in Appendix 3.2.

**The multipliers used to evaluate the fiscal packages**

	United States		Germany		Belgium	
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
<b>Spending measures</b>						
Infrastructure investment	0.9	1.1 - 1.3	0.8	1.0 - 1.2	0.7	0.9 - 1.1
Government purchase of goods	0.7	0.8 - 1.1	0.4	0.5 - 0.8	0.3	0.4 - 0.7
Transfers to household	0.5	0.8 - 0.9	0.3	0.5 - 0.7	0.2	0.4 - 0.6
<b>Revenue measures</b>						
Personal income tax cuts	0.3 - 0.5	0.5 - 0.9	0.2 - 0.3	0.3 - 0.7	0.1 - 0.2	0.2 - 0.6
Indirect tax cuts and other measures	0.2 - 0.3	0.3 - 0.5	0.1 - 0.2	0.2 - 0.4	0.1	0.1 - 0.3

Source: OECD.

*... and the likely activity impacts differ widely by country*

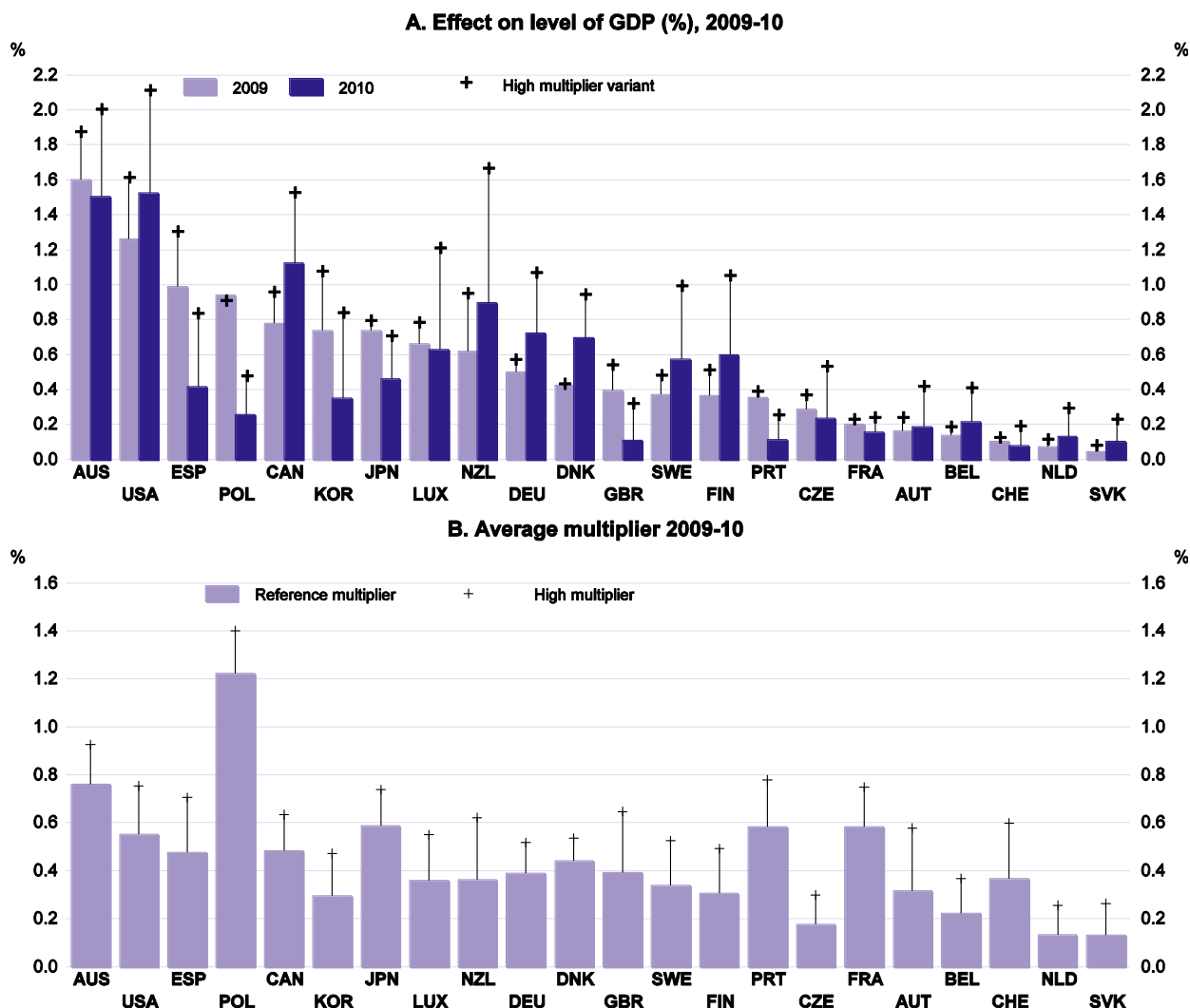
The stimulus effect of these fiscal packages on GDP is thus estimated by applying a set of multipliers which vary both across policy instrument and country. On the basis of the reference multipliers, the implied effect on GDP is largest from the fiscal packages in Australia and the United States at between 1.2 and 1.6% of GDP over 2009 and 2010 (Figure 3.4), although the effect is about 1% of GDP for Poland and Spain in 2009 as well as Canada and New Zealand in 2010. For other countries the likely impact of the fiscal packages is small, particularly judged against the magnitude of the impending output gap. These estimates do not take into account cross-country spillovers, such as when, for example, Belgian activity benefits from stimulus in Germany.

**The case for further discretionary fiscal action in the current crisis**

*Additional room for monetary policy still exists for some countries*

With many OECD countries facing their most severe downturn in the post-war period, the benefits from additional discretionary fiscal policy action varies among countries according to the depth of the downturn but also the available room for further monetary easing. While some central banks have cut policy rates to a point where the zero lower bound is either very close or already binding, others still have additional room for cuts, which implies that the need for discretionary fiscal action is reduced. With the effectiveness of monetary policy open to question in the current situation, and with an argument that more demand stimulus may be desirable than can be delivered by monetary policy, fiscal stimulus may be desirable even though monetary policy has scope to ease further.

Figure 3.4. The effect of fiscal packages



Note: Bars indicate values based on the reference multiplier case. Crosses show estimates based on a high multiplier alternative. See Box 3.1 for explanation of the basis for the multiplier assumptions. Countries are arranged according to the size of effect in 2009.

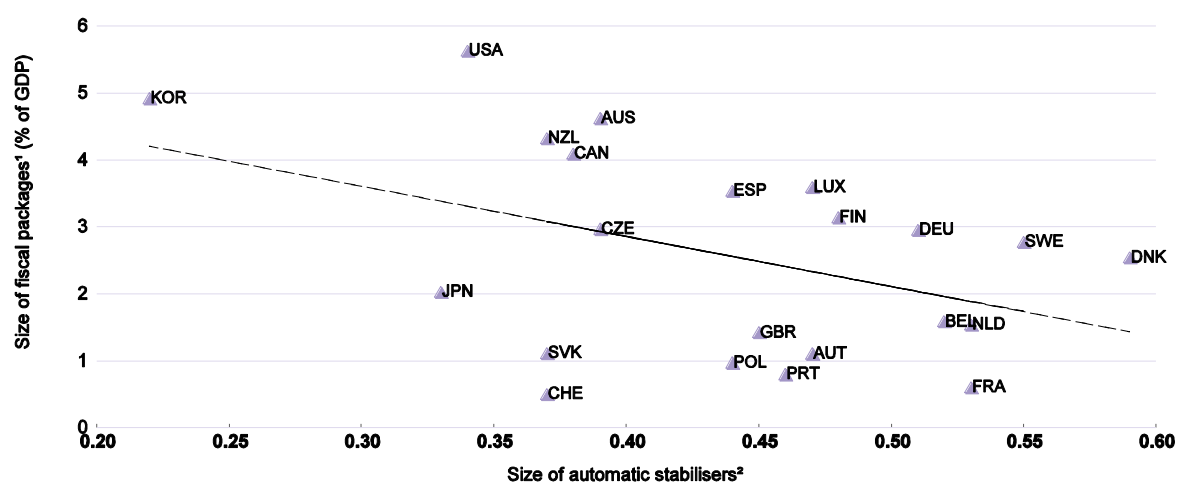
Source: OECD.

***The size of fiscal packages is inversely related to automatic stabilisers***

The case for additional discretionary fiscal stimulus will also depend on the materialisation of further negative shocks and the extent to which these are mitigated by automatic stabilisers. These operate more powerfully in some economies than in others. The extent of automatic stabilisation depends on several factors: the size of the public sector, the cyclicality of the tax base, the design of the public social security system and the progressivity of taxes. It tends to be particularly weak in Korea, Japan, United States, Switzerland and New Zealand and particularly strong in northern European countries with well developed social security systems. The extent of discretionary fiscal measures planned or implemented over the period 2008 to 2010 indeed varies inversely with the strength of

automatic stabilisers (Figure 3.5). Moreover, one of the priorities for discretionary fiscal action in some countries, including the United States, is to avoid weakening automatic stabilisation by addressing funding shortfalls at lower levels of government where the operation of balanced budget rules can otherwise lead to severe fiscal tightening.

Figure 3.5. Size of discretionary fiscal packages varies inversely with the automatic stabilisers



1. Total ex ante cost of discretionary fiscal packages over the period 2008-10.
2. Coefficient summarising the automatic change in the fiscal balance due to a 1 percentage point change in the output gap.

Source: Girouard and André (2005) and Table 3.1.

### The scope for discretionary fiscal policy: ensuring fiscal sustainability

#### *Scope varies widely across countries*

The scope for additional fiscal stimulus varies widely across countries according to their initial fiscal conditions, both in terms of the current underlying deficit and debt position as well as, at least in principle, contingent liabilities related to the financial crisis and future long-term spending pressures relating to factors such as ageing.

#### *Gross government debt is set to increase substantially*

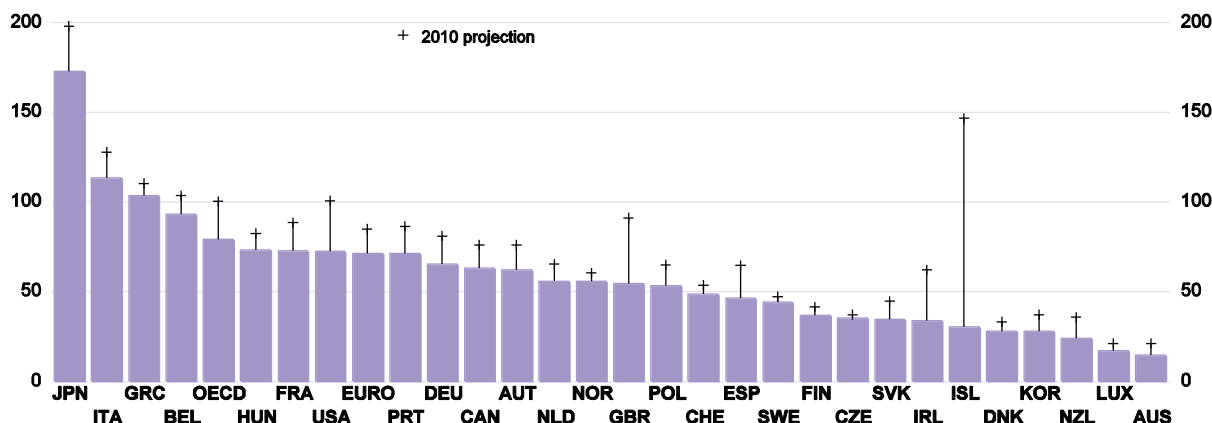
OECD gross government debt as a share of GDP is projected to increase sharply, from 75% of GDP in 2007 to about 100% of GDP in 2010, reflecting substantial budget deficits and off-budget spending in many countries (Figure 3.6).<sup>31</sup> Increases in the debt ratio of this magnitude have usually occurred in conjunction with banking crises, such as for the Nordic countries in the early 1990s, Mexico in 1994 and Japan during the 1990s. The projected increase in OECD gross debt reflects a combination of

31. Gross debt is often considered to be more relevant than net debt for gauging the impact of public borrowing on financial markets (Fatás, 2005). In addition, true economic value of gross financial assets is sometimes difficult to pin down and the quality (and liquidity) of some assets may be questionable (*e.g.* when loans to public and private enterprises have *de facto* subsidy component and may not be fully paid back).

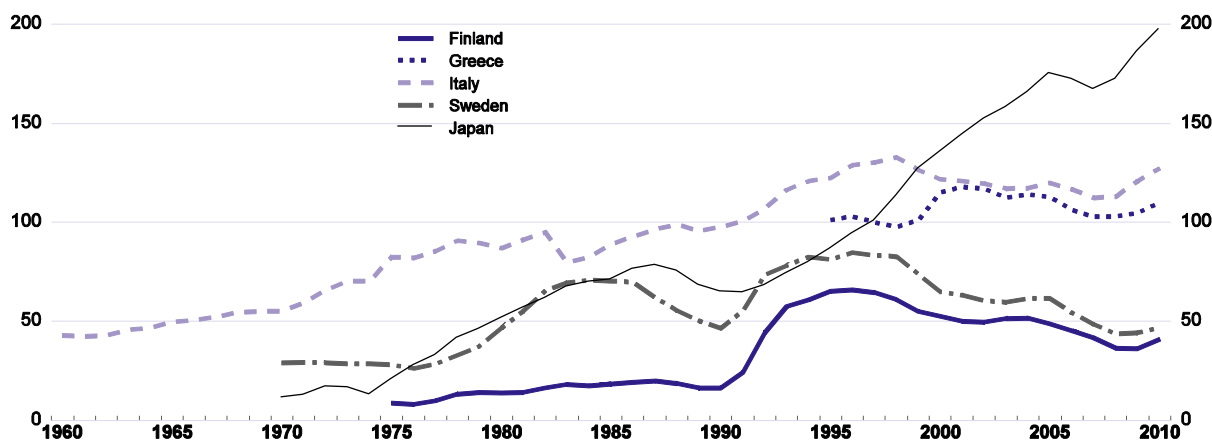
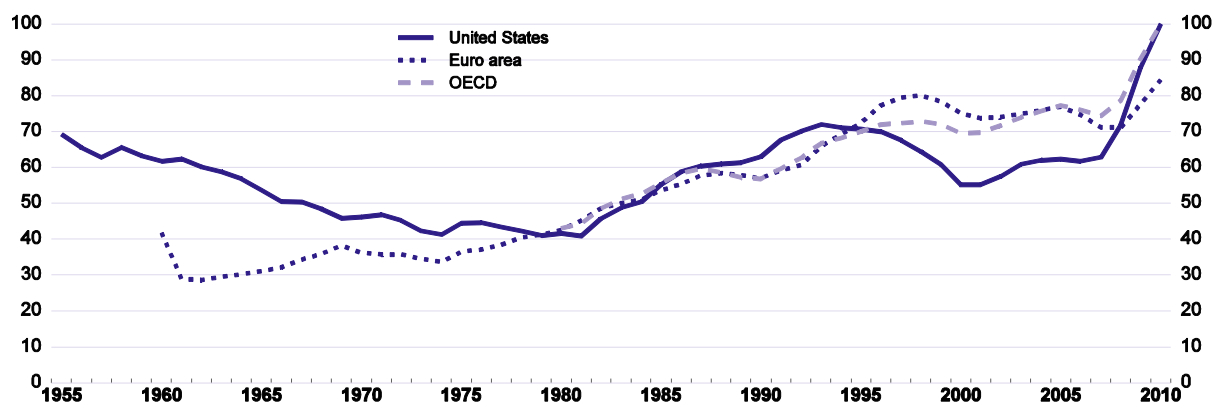
Figure 3.6. General government gross financial liabilities

Per cent of GDP

A. 2008 level



B. Trends in selected OECD countries



Note: Gross debt data are not always comparable across countries due to different definitions or treatment of debt components. Notably, they include the funded portion of government employee pension liabilities for some OECD countries, including the United States. The debt position of this country is thus overstated relative to countries that have large unfunded liabilities for such pensions, which according to ESA95/SNA93 are not counted in the debt figures but rather as a memorandum item to the debt.

Source: OECD.

loss of previous exceptional revenues, mostly associated with the collapse of financial-asset and house prices, the operation of automatic stabilisers as well discretionary fiscal measures, notably the stimulus packages described above. It also includes debt incurred to finance capital injections into banks and financial institutions as well as purchases of financial assets. However, it does not build in possible additional costs associated with the financial crisis through providing government guarantees or losses made on asset purchases, although the experience of previous banking crises suggests that such costs can be substantial.<sup>32</sup> Further pressure on fiscal positions may result if potential output is adversely affected by the economic crisis, for example through a rise in structural unemployment. There is also some evidence from previous episodes to suggest that the more prolonged a banking crisis becomes the greater the risk of an adverse effect on trend productivity growth (Haugh *et al.*, 2009).

***Scope for stimulus also depends on longer-term spending pressures***

The rise in taxes or cuts in current spending needed to stabilise or even reverse government debt should be seen against the background of rising spending on pensions and health care, unless these areas are thoroughly reformed. Recent projections for public spending on old-age pensions show an increase by almost 4½ percentage points of GDP among a panel of 26 OECD countries over the period 2005 to 2050, but with considerable cross-country variations (Table 3.3). Demographic effects are also projected to raise public spending on health and long-term care by 2 percentage points of GDP on average in OECD countries over the period 2005 to 2050 (Table 3.3). Combined with the other key drivers and unless policy action to control costs becomes more successful than in the past, public spending on health and long-term care could double from 6½ to almost 13% of GDP on average in OECD countries between 2005 and 2050, but with significant differences across countries (Oliveira Martins and de la Maisonneuve, 2006).

***Measures of the “tax gap” imply limited fiscal scope for many countries***

A simple summary measure of the extent of such future spending pressures is provided by estimates of the increase in the current primary balance, sometimes referred to as a “fiscal gap” or “tax gap”, that would be required to keep the general government debt ratio to its 2008 level -- which was already very high in some countries -- in 2050 (Table 3.4).<sup>33</sup> This

32. According to Claessens and Klingebiel (2000), these costs amounted to more than 10% of GDP in Finland in the early 1990s and to about 20% of GDP in Japan between 1992 and 2000. See also Box 1.5 of OECD (2008).

33. Such calculations are sensitive to the underlying assumptions regarding growth and interest rates as well the somewhat arbitrary choice of a debt target. For the purpose of the calculations reported in Table 3.4 the assumptions are chosen so as to err on the side of optimism. Key assumptions underlying the calculations include that: *i*) from 2010 onward, potential growth rates and long-term real interest rates are assumed to remain unchanged from OECD projections for 2010. Thus, possibilities of lower potential growth rates in the long run (due either to the financial crisis or aging) as well as higher interest rates for government bonds are excluded; *ii*) real GDP growth rates between 2011 and 2013 have been calculated based on the assumption that output gaps remaining in 2010 will be closed by 2013 and growth thereafter is assumed to be equal to the potential rate; *iii*) to calculate effects on gross debt, gross assets are assumed to remain a constant share of GDP from 2011 onwards; and *iv*) no direct effect is included on government gross debt for the direct effect of additional costs from dealing with the financial crisis.



**Table 3.3. Public spending on health care, long-term care and pensions is set to increase considerably**

*2005-2050 increase, in percentage points of GDP*

	Health care	Long-term care	Pensions	Total
United States	3.4	1.7	1.8	7.0
Japan	4.3	2.2	0.6	7.1
Euro area	3.7	2.2	3.0	8.9
Germany	3.6	1.9	2.0	7.5
France	3.5	1.7	2.1	7.3
Italy	3.8	2.9	0.4	7.0
United Kingdom	3.6	1.9	1.7	7.2
Canada	4.1	2.1	1.7	7.9
Belgium	3.3	1.9	5.1	10.3
Netherlands	3.8	2.0	3.8	9.6
Sweden	3.2	1.1	0.8	5.1
Switzerland	3.5	1.4	3.6	8.5
Australia	4.2	2.0	1.7	7.9
Denmark	3.5	1.5	3.2	8.2
Finland	3.6	2.4	3.3	9.3
Greece	3.9	2.7	10.3	16.8
Ireland	4.0	3.8	6.5	14.4
Korea	4.9	3.8	7.8	16.4
Luxembourg	3.7	3.1	7.4	14.3
New Zealand	4.2	2.0	5.9	12.0
Norway	3.4	1.7	8.7	13.9
Portugal	4.2	2.0	9.3	15.5
Spain	4.1	2.4	7.0	13.5

*Note:* OECD projections for increases in the costs of health and long-term care have been derived assuming unchanged policies and structural trends. The corresponding hypotheses are detailed in OECD (2006) under the heading "cost-pressure scenario". Projections of public pension spending are taken from EU EPC (2006) for EU countries, from Visco (2005) for Canada, Japan, Switzerland and the United States and Dang *et al.* (2001) for Australia, Korea and New Zealand.

*Source:* OECD (2006), "Projecting OECD Health and Long-term Care Expenditures: What Are the Main Drivers?", *OECD Economics Department Working Papers*, No. 477, Paris ; Visco (2005), "Ageing and Pension System Reform: Implications for Financial Markets and Economic Policies", *Financial Market Trends*, November 2005 Supplement, OECD, Paris ; EU EPC (2006), *Impact of Ageing Populations on Public Spending*, European Commission, Brussels and Dang *et al.* (2001), "Fiscal Implications of Ageing: Projections of Age-Related Spending", *OECD Economics Department Working Papers*, No. 305, Paris.

calculation underestimates the extent of fiscal pressures on those countries, such as Japan and Italy, which start with a very high level of debt in 2008 and correspondingly overestimate pressures on countries with low 2008 debt ratios such as Australia and Korea. With these caveats in mind, the results suggest that almost all OECD countries face a substantial fiscal gap and so a need to raise their underlying primary surplus over the medium term. The required primary surplus is particularly large for countries with a less favourable outlook on expenditure increases over long horizon

Table 3.4. Measures of the increase in underlying primary balance required to stabilise debt

	Gross debt ratios <sup>1</sup>		Underlying primary balances					Fiscal gap <i>vis-à-vis</i>	
	Outcomes	Projections	Outcomes	Projections	Required primary surpluses to keep gross debt ratios in 2050 to 2008 levels		2008	2010	
	2008	2010	2008	2010	2008	2010	2008	2010	
			A	B	B-A	C	D	C-A	D-B
United States	71.9	100.0	-3.5	-6.7	-3.2	3.4	4.1	6.9	10.8
Japan	172.1	197.3	-2.9	-3.4	-0.5	4.6	5.0	7.5	8.5
Euro Area	71.0	84.4	1.2	-0.1	-1.3	4.2	4.5	3.0	4.6
Germany	64.8	80.4	1.9	-0.9	-2.8	3.5	3.9	1.6	4.8
France	72.2	88.0	-0.9	-2.1	-1.2	3.6	4.1	4.5	6.1
Italy	113.1	127.2	3.2	4.0	0.8	4.9	5.1	1.8	1.1
United Kingdom	54.1	90.5	-2.3	-5.2	-2.9	3.4	4.2	5.7	9.4
Canada	62.7	75.4	0.6	-2.6	-3.3	3.7	3.9	3.0	6.6
Australia	14.2	20.7	2.3	-0.7	-3.0	4.2	4.1	1.8	4.9
Austria	61.7	75.4	1.2	-1.2	-2.3	2.4	2.7	1.2	3.8
Belgium	92.7	103.0	2.6	2.4	-0.2	5.0	5.0	2.4	2.6
Czech Republic	34.8	36.5	-0.6	1.9	2.5	5.2	4.9	5.8	3.0
Denmark	27.4	32.7	3.2	1.9	-1.3	3.4	3.6	0.2	1.7
Finland	36.3	41.0	3.4	0.8	-2.6	6.1	5.8	2.7	5.0
Greece	103.0	109.8	-0.9	1.3	2.2	7.9	7.6	8.8	6.3
Hungary	72.7	81.7	1.3	7.9	6.7	6.8	6.8	5.5	-1.2
Ireland	33.5	61.7	-5.4	-6.1	-0.7	7.3	7.2	12.8	13.4
Korea	27.4	36.6	2.8	1.8	-1.1	9.5	9.6	6.7	7.8
Luxembourg	16.5	20.7	1.8	1.4	-0.4	8.8	8.3	7.0	6.9
Netherlands	55.3	64.6	1.9	-0.7	-2.5	4.6	4.7	2.7	5.3
New Zealand	23.6	35.1	2.3	-1.7	-4.0	4.9	5.0	2.6	6.8
Poland	52.7	64.5	-1.9	-3.0	-1.2	-0.2	0.4	1.6	3.4
Portugal	70.7	85.9	1.5	1.4	-0.1	7.0	7.3	5.6	5.9
Slovak Republic	34.0	44.2	-3.7	-4.2	-0.5	4.2	4.3	7.9	8.6
Spain	45.9	64.1	-0.8	-1.0	-0.3	6.0	6.2	6.8	7.2
Sweden	43.6	46.6	4.0	2.7	-1.3	2.2	2.2	-1.9	-0.6
Switzerland	48.0	52.8	1.5	0.6	-0.9	4.2	4.1	2.7	3.5
Simple average	57.9	70.6	0.5	-0.4	-0.9	4.9	5.0	4.4	5.5
Weighted average	79.7	101.3	-1.3	-3.3	-2.0	4.1	4.5	5.4	7.8

Notes: Required primary surpluses have been estimated based on the interim OECD projections up to 2010. Thereafter, potential growth rates and long-term real interest rates are assumed to remain unchanged. Real GDP growth rates between 2011 and 2013 have been calculated on the assumption that the output gap remaining in 2010 will be closed by 2013. Growth thereafter is assumed to be equal to the potential rate. Projections on health, long-term care and pension expenditures to 2050 are based on Cournède (2008). Gross assets are assumed to remain constant, as a percent of GDP, from 2011 onward. The fiscal gap in 2010 incorporates the impact of fiscal packages.

1. Gross debt data shown in this table correspond to the implementation of the System of National Account principles. They differ from gross debt data according to the Maastricht criterion.

Source: OECD.

(including Greece, Korea, Portugal and Ireland) and/or with weaker initial fiscal conditions (including the United States,<sup>34</sup> Japan, United Kingdom, Greece, Iceland and Ireland). The crisis has added to this through the need to reverse fiscal packages in the medium term and to compensate for the loss of exceptional revenue buoyancy. The expected deterioration of the fiscal gap between 2008 and 2010 is greatest for those countries which plan to introduce the largest stimulus packages and/or will experience the largest losses of “exceptional revenues” or incur large costs associated with supporting the financial system. For the OECD area as a whole, the fiscal gap is expected to deteriorate from just over 5% in 2008 to nearly 8% in 2010. Taking into account both the initial level of government debt as well as measures of the fiscal gap, suggests that countries which might have most scope for additional fiscal manoeuvre include Germany, Canada, Australia, Netherlands, Switzerland, Korea and some Nordic countries.

***High indebtedness is likely to incite Ricardian behaviour***

The more limited the scope for discretionary fiscal action the less effective any such action is likely to be. A relatively robust conclusion in the literature is that Ricardian equivalence, implying an offsetting increase in private sector savings behaviour, is more likely to hold where governments are highly indebted (Berben and Brosens, 2007): when the debt ratio is high, the fiscal situation becomes increasingly unsustainable and economic agents consider future increases in tax more likely and tend to offset fiscal injection by increases in saving. Alternatively, to the extent that there is not a complete offset in private savings behaviour, the higher the level of government debt the more likely that there will be a rise in long-term interest rates which will have both offsetting effects on aggregate demand and for highly indebted countries imply a substantial increase in debt servicing costs.

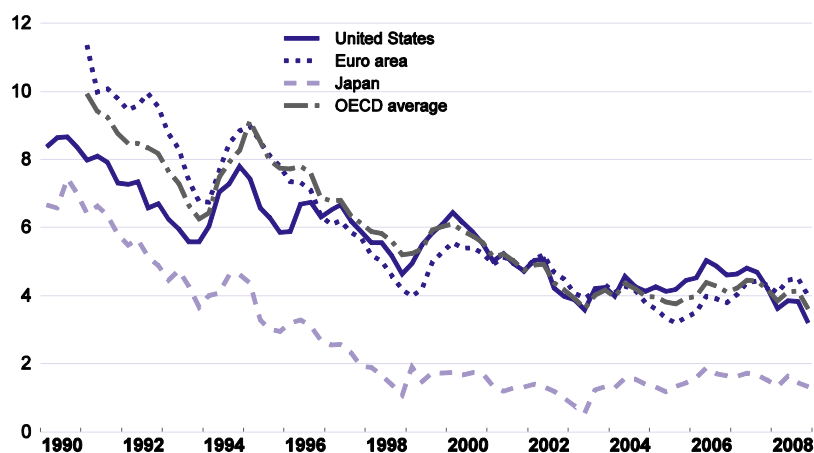
***Interest rates are likely to rise over the medium term***

Concerns about additional pressures from fiscal imbalances on long-term interest rates should be put in the context that this may occur on top of a more general rise in long-term interest rates over the medium term. Over most of the past decade, long-term interest rates in the major OECD countries have been unusually low (Figure 3.7). While this may partly reflect global factors including lower inflation (Bernanke, 2005), it is also a reflection of policy rates that have been unusually low for much of this period, and in retrospect possibly even too low in some cases (Ahrend *et al.*, 2006), while risk was under-priced. Interest rates on long-term government bonds for the major OECD countries have also been pushed lower during the current crisis by a flight of capital to safer financial assets. The eventual normalisation of financial conditions and policy rates is thus likely to involve a general increase in long-term interest rates.

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34. The estimate of the fiscal gap for the United States to stabilise gross debt at the 2008 level is similar to the estimate of between 7 to 9% of GDP, found by Auerbach and Gale (2009), once the effect of the stimulus package is excluded.

Figure 3.7. Nominal interest rates on ten-year government bonds



Source: OECD.

### ***Higher government debt raises interest rates***

The evidence regarding the effect of fiscal imbalances on interest rates is both mixed and controversial. However, the spread between a measure of long and short-term interest rates across all OECD countries since the mid-1990s is positively correlated with government indebtedness (Figure 3.8). Moreover, an increasingly common finding in the economic literature is that expected, rather than current, fiscal deficits have an effect on long-term interest rates on government bonds (Table 3.5).<sup>35</sup> For example, Laubach (2003) finds that a 1 percentage point of GDP increase in expected fiscal deficits in the United States increases interest rates on 10-year government bonds by about 25 basis points. Further evidence of a link between fiscal imbalances and interest rates is provided by the recent widening in euro area sovereign bond spreads which can be explained by a combination of measures of government indebtedness, expected fiscal deficits as well as previous fiscal track record (Box 3.2). There is also some evidence that interest rate effects are non-linear and tend to be greater at higher levels of indebtedness.<sup>36</sup> On this basis, stimulus will have a higher fiscal cost for highly-indebted countries, not only because higher interest rates will affect a larger debt but also because the interest-rate effect itself will be larger.

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35. There are a number of inherent econometric difficulties in examining the link between fiscal imbalances and interest rates. In particular, any relationship may be obscured by the cycle as the effect of a downturn will tend to raise fiscal deficits as well as lower interest rates due the response of monetary policy. However, some problems relating to unobserved variables such as long-term inflation expectations or exchange rate risk are eased by considering interest rate differentials within a common currency region.
36. Such non-linear effects are also found in Bayoumi *et al.* (1995) among US states and by Conway and Orr (2002) and O'Donovan *et al.* (1996) among the major OECD countries.

Table 3.5. **Estimated impact of fiscal variables on interest rates**

Reference	Countries	Fiscal variables <sup>1</sup>	Estimated effects on long-term interest rates in basis points (bps)
<b>Studies that focus on flow fiscal variables</b>			
Thomas and Wu (2009)	United States	A 1% point increase in projected fiscal deficit in 5 years	30-60 bps
Bernoth et al (2006)	14 EU countries	A debt -service ratio 5% above Germany's	32 bps (Spread vis-à-vis Germany, post-EMU period, some non-linear effects)
Dai and Philippon (2005)	United States	A 1% point increase in fiscal deficit lasting 3 years	20-60bps
Ardagna et al (2004)	16 OECD countries	A 1% point deterioration in primary balance	10 bps
Laubach (2003)	United States	A 1% point increase in projected fiscal deficit	25 bps
Literature review by Gale and Orzag (2003)	United States	A 1% point increase in projected fiscal deficit	40-50 bps
Literature review by Gale and Orzag (2002)	United States	A 1% point increase in projected fiscal deficit	50-100 bps (macro models) 50 bps (others)
Canzeroni, Cumby and Diba (2002)	United States	A 1% deterioration in projected fiscal balance, 5 to 10 year ahead	41-60 bps (Spread of 10-year yield over 3-month)
Linde (2001)	Sweden	A 1% deterioration in fiscal balance	25 bps after 2 years (Domestic-foreign long-term interest differential)
Reinhart and Sack (2000)	19 OECD countries	A 1% deterioration in fiscal balance in current and next years	9 bps (yield)
	G7		12bps (yield)
Orr, Edey and Kennedy (1995)	17 OECD countries	A 1% point deterioration in fiscal balances	15 bps
<b>Studies that focus on stock fiscal variables</b>			
Chinn and Frankel (2005)	Germany, France, Italy, UK and Spain	A 1% increase in current net debt	5-8 bps
		A 1% increase in net public debt ratio projected 2 years ahead	10-16 bps
	USA	A 1% increase in current or projected net debt	5 bps over period 1998-2002, but obscured when extended to 2004
Ardagna et al (2004)	16 OECD countries	Public debt	non-linear
Engen and Hubbard (2004)	United States	A 1% point increase in debt ratio	3 bps (with ranges)
Laubach (2003)	United States	A 1% point increase in projected debt ratio	4 bps
Chinn and Frankel (2003)	Germany, France, Italy, Japan, Spain UK and USA	A 1% increase in net public debt ratio projected 2 years ahead	3-32 bps (individual country) 7-12 bps (European interest rates)
Codogno et al (2003)	9 EMU countries	Debt-to-GDP ratio	Small and significant effects on spreads for Austria, Italy and Spain
Conway and Orr (2002)	7 OECD countries	A 1% point increase in net public debt	Less than 1 bps (Real 10-year bond yields, starting from zero net debt) 1.5 bps (Real 10-year bond yields, starting from 100% net debt)
O'Donovan, Orr and Rae (1996)	7 OECD countries	A 1% point increase in net public debt	Less than 1 bps (Real 10-year bond yields, starting from zero net debt) 2 bps (Real 10-year bond yields, starting from 100% net debt)
Ford and Laxton (1995)	9 countries	A 1% point increase in world net public debt	14 - 49 bps (Real 1-year bond yields )
	World		15 -27 bps (Real 1-year bond yields )

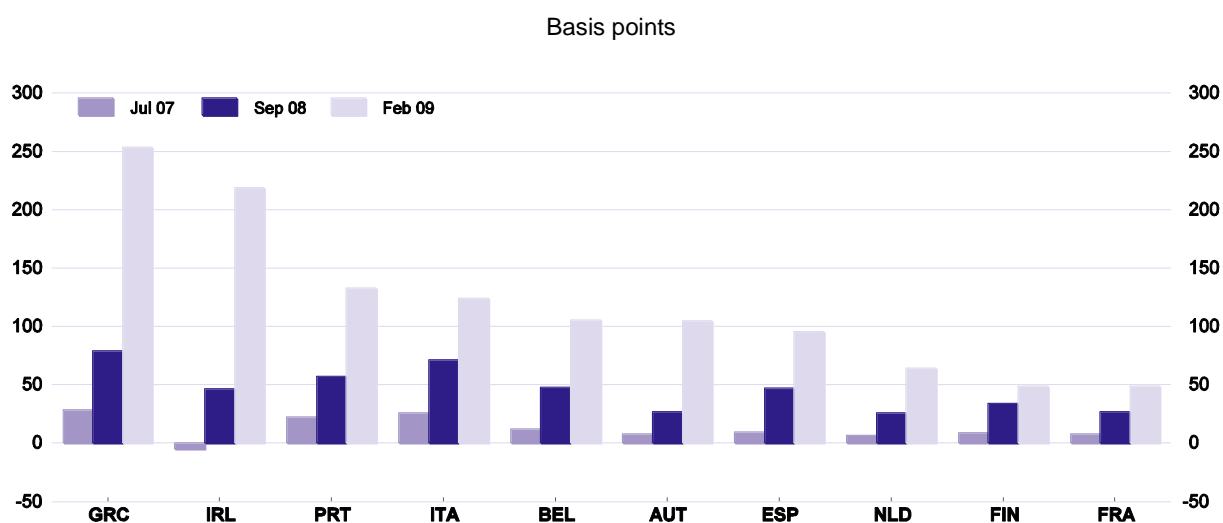
1. All changes are expressed in relation to GDP unless otherwise specified.

Source: OECD.

**Box 3.2. What drives sovereign bond spreads in the euro area?**

Since the onset of the financial crisis there has been a marked rise in the spreads between the yield on German ten-year sovereign bonds and those issued by other countries in the euro zone. To shed light on these developments, a simple panel model is estimated to explore a range of potential drivers. Potential explanatory variables include various measures of government indebtedness (both the gross and net debt-to-GDP ratios, as well as a debt service ratio measured as the ratio of interest payments on government debt to current government revenue), expected future fiscal deficits over the next five years (proxied by successive *Economic Outlook* forecasts) and a bivariate 'fiscal track record' indicator which takes a value of unity if a country has a history of running large fiscal deficits over a prolonged period and zero otherwise. The general degree of risk aversion is also reflected by using a measure of the euro area corporate bond spread.

**Euro area ten-year government bond spread with Germany**



Note: Monthly averages.

Source: OECD, Main Economic Indicators database; and Datastream.

Two preferred equations from this analysis, reported in the table below, are able to explain the general pattern of relative upward movements in spreads since the beginning of the crisis, while a more comprehensive set of results is discussed in Haugh and Turner (2009). The preferred measure of indebtedness is the debt service ratio, which follows similar findings to those of Bernoth *et al.* (2004) who argue that the debt service ratio is closer in concept to measures of borrower quality used in corporate finance and allows for the fact that countries differ in their ability to raise taxes from a given volume of GDP and so focuses on the constraint that high debt burdens impose on annual budgetary flows. The influence of the debt service ratio is non-linear (as denoted by the significance of a squared debt service term), another finding common to Bernoth *et al.* (2004), and amplified by both a poor fiscal track record and the degree of general risk aversion. Thus, for a country with an initial debt service ratio and expected deficit equal to the euro area average, and for December 2008 levels of risk aversion, successive one standard deviation (3 percentage points) increases in the debt service ratio are predicted to result in an increase in the spread of 14, 34, 59 and 90 basis points, while for a country with a poor fiscal track record the increases would be 18, 43, 76 and 115 basis points. Higher expected future deficits are also important in explaining recent movement in spreads, particularly in the case of Ireland which has experienced a substantial widening in its spread, although current levels of debt and debt service remain relatively modest. General risk aversion also intensifies the effect of a poor fiscal track record and higher expected deficits.

## Box 3.2. What drives sovereign bond spreads in the euro area? (continued)

## Panel equations of interest rate spreads in the euro area

	Equation 1		Equation 2	
	Coefficient	t-statistic	Coefficient	t-statistic
Constant	-1.39	-0.61	1.55	0.76
Risk <sup>1</sup>	2.12	4.60	1.55	3.57
Risk*track record <sup>2</sup>	1.08	1.81		
Risk*expected fiscal balance <sup>3</sup>	-0.30	-3.09	-0.35	-3.45
Risk*debt service squared <sup>4</sup>	0.02	2.38	0.03	3.79
Track record*debt service squared	0.09	2.39		
Track record*risk*expected fiscal balance			-0.38	-1.76
Adjusted R <sup>2</sup>	0.87		0.85	

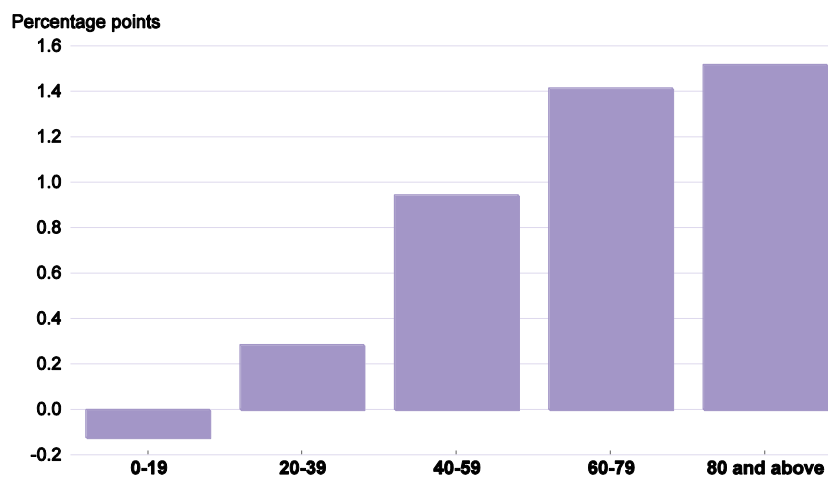
Note: Estimation Period: 2005 Q4 - 2008 Q4. Frequency: 6 monthly. Countries: Austria, Belgium, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal and Spain.

1. Yield spread between high yield corporate bonds and government bonds.
2. Track record equals 1 if the country has a history of sustained fiscal deficits greater than 3% of GDP, otherwise 0.
3. Average of OECD forecasts for the fiscal balance as a percentage of GDP in the following 5 years.
4. Gross government interest payments divided by current government receipts.

Source: OECD calculations

Figure 3.8. Higher government debt tends to raise long-term interest rates

Spread between long-term and short-term interest rates versus gross government debt in % of GDP



Note: Bars represent average across all OECD countries for which data are available over the period 1994 to 2007. Short-term interest rates are typically rates on 3-month Treasury bills and long-term interest rates those on 10-year government bonds.

Source: OECD.

### **Appropriate design of fiscal stimulus packages**

#### ***Design of fiscal packages is crucial***

The design of fiscal packages, both in terms of the composition of individual measures as well as their timing, is very important in maximising their effectiveness. The previous multiplier analysis suggests that the largest short-run impact on aggregate demand is from government spending measures, but that where tax cuts are implemented they are most effective if targeted at households that are likely to be liquidity-constrained. A complementary criteria for selecting individual measures is the potential to both raise aggregate demand in the short run as well as aggregate supply in the long run. A recent OECD report (OECD, 2009), *Going for Growth*, identifies three broad fiscal/structural reforms that could yield such a “double-dividend” at present: increased spending on infrastructure; increased spending on active labour market policy, including on compulsory training courses; and reduction of personal income taxes, notably on low-income earners.

#### ***Concerns about timeliness may be reduced***

One of the disadvantages often cited against using discretionary fiscal policy is the problem of timeliness, both in terms of the measures being implemented when they are most needed and then being subsequently adjusted or removed. Thus infrastructure investment, because of its typically long implementation and gestation lags, scores poorly in this regard unless there are projects which are “shovel-ready” or there are repair and maintenance programmes that can readily be brought forward. However, the magnitude of the current downturn is likely to have reduced these concerns somewhat, both because it appears that political decision-making can be more rapid during a period of crisis and because the downturn is expected to last a number of years. Nevertheless, an important issue in the current context is how long any stimulus should be sustained, since an abrupt phasing out of a positive stimulus has an adverse impact on the growth rate of output.

#### ***The duration of any fiscal stimulus is key in determining fiscal costs***

An implication of the finding that higher expected deficits increase long-term interest rates is that a temporary fiscal injection may be more effective than a more sustained fiscal injection which is expected to significantly worsen the long-term fiscal outlook. This is illustrated by a simple stylised model (described fully in Appendix 3.3) with an effect from expected fiscal deficits calibrated so that an increase in the average expected fiscal deficit over the coming five years by 1% of GDP increases the sovereign risk premium on long-term government bonds by 25 basis points (consistent with Laubach, 2003). Similar results suggesting that a temporary fiscal stimulus can be almost as effective as a more sustained stimulus, but with much lower debt costs, are a feature of the DSGE model outlined in Appendix 3.4.



*A simple model...*

The model can be calibrated so as to represent stylised features of different OECD economies. In the first instance, it is calibrated to be representative of the US economy<sup>37</sup> and subject to a substantial adverse shock. In the absence of any policy response, the shock would generate an output gap of 7% in the first two years and the gap would only be closed after eight years.<sup>38</sup> In the absence of any discretionary fiscal policy action, monetary policy together with the effects of the automatic stabilisers would offset nearly 30% of the adverse shock to the output gap (first column of Table 3.6 and Figure 3.9). However, the effect of monetary policy (and the automatic stabilisers) is roughly half compared to their effectiveness in offsetting a more modest (and typical) adverse shock because the zero interest rate floor for short-term policy rates is quickly encountered.<sup>39</sup>

Table 3.6. **Summary of model simulation results on the effects of discretionary fiscal policy**

		Profile of discretionary fiscal injection			
		None	Sustained	Temporary	Reversed
Maximum output gap	(1)	-5.8	-4.0	-3.8	-3.8
Cumulative output gap	(2)	20.3	12.1	14.6	13.5
Cumulative ex ante output gap shock	(3)	30.0	30.0	30.0	30.0
Cumulative output gap as % of shock	(4)=(2)/(3)	68 %	40 %	49 %	45 %
Increase in debt after 10 years (% pts of GDP)	(5)	8.4	23.0	13.5	4.0
Debt per % pt of output gap reduced	(5)/[(3)-(2)]		1.3	0.9	0.2

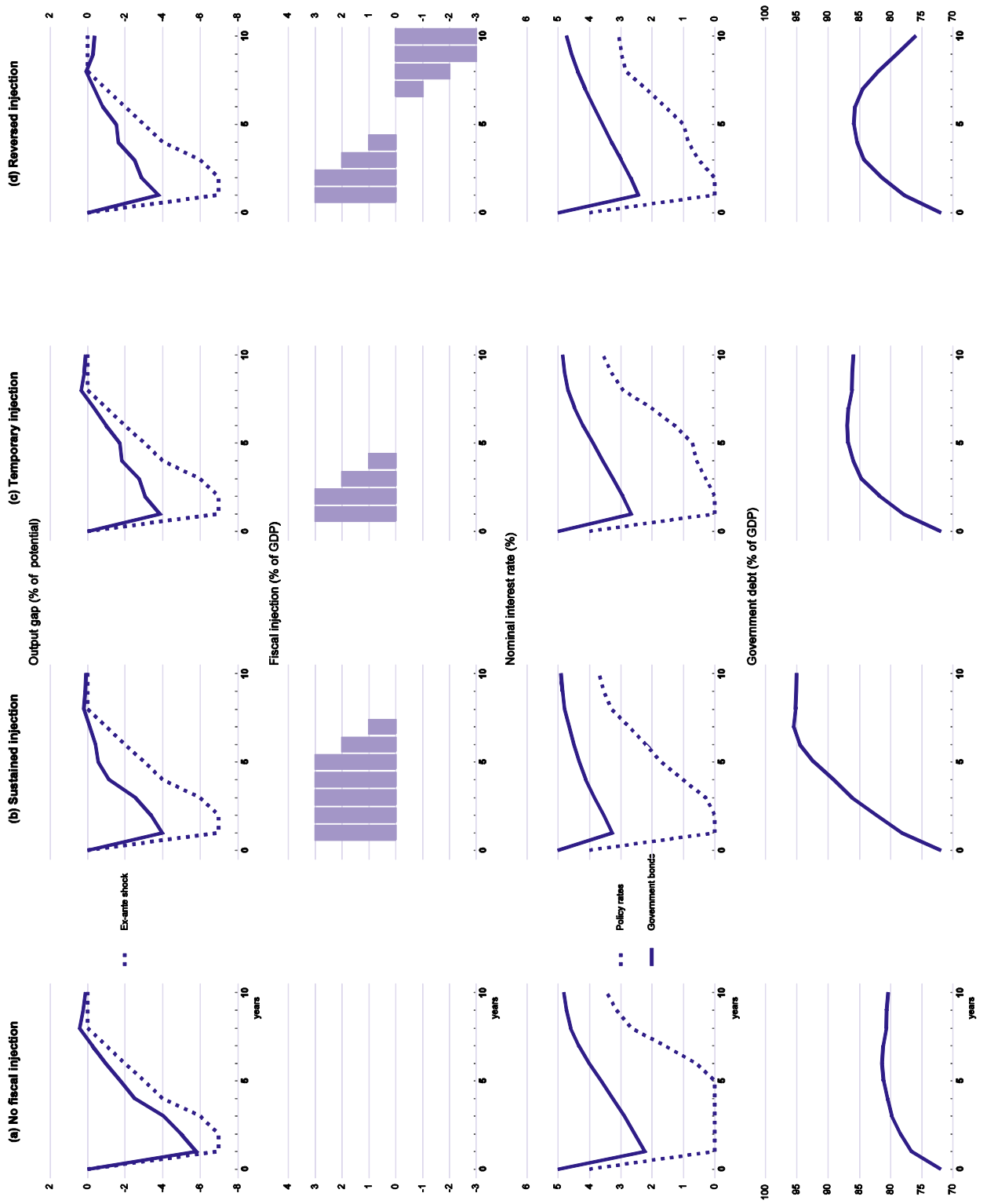
Source: OECD.

*... illustrates that fiscal policy can help to moderate the downturn...*

Under these circumstances discretionary fiscal stimulus can play a useful role in offsetting the effect of the shock, but the time profile of the stimulus can have very different implications for the fiscal costs of reducing the output gap. Three alternative time profiles for a fiscal injection, which in the first two years amounts to 3% of GDP for all three cases, are considered (corresponding to the second, third and fourth columns of Figure 3.9): in the first case the fiscal injection is “sustained” throughout the recession and only phased out with the recovery; in the second case the

- 
37. The calibration assumes that relative to the OECD average, aggregate expenditures are more interest-sensitive, multipliers are larger, automatic stabilisers weaker and debt levels in relation to GDP are close to the average.
38. This magnitude of shock is broadly consistent with effect of current financial conditions, under the assumptions that they remain at 2009 Q1 levels throughout the remainder of 2009 and normalise only gradually by the end of 2010, see Guichard *et al.* (2009).
39. The model cannot capture monetary policy actions beyond the zero-interest policy rate floor and therefore may exaggerate the weakness of the economy and the time spent at the zero floor.

Figure 3.9. Differing responses to a large negative shock depending on size and profile of the fiscal injection



Source: OECD.

fiscal injection is “temporary”<sup>40</sup> being phased out as the trough of the recession is passed; in the final case the fiscal injection is “reversed”, with this process beginning even before the output gap is closed.

***... but sustained stimulus is not more effective than a temporary one...***

For all three profiles of fiscal injection the output gap is substantially reduced relative to the case of no fiscal action. However, the differences between the three cases in terms of their effect on the output gap are relatively modest; the sustained fiscal injection has a marginally smaller cumulative output gap, whereas if the fiscal injection is reversed the trough of the recession is marginally reduced. A sustained fiscal injection is not substantially more effective because, although long-term interest rates fall in all three scenarios (because policy rates are expected to persist at zero or very low rates), they fall by significantly less in the case of the sustained fiscal injection. This is both because fiscal deficits are expected to be more persistent and so raise the risk premium and because monetary policy needs to begin tightening earlier in the recovery to offset some of the fiscal stimulus.

***... and much more costly in terms of public debt***

There are, however, major differences in terms of the resulting increase in government debt with the sustained fiscal injection resulting in a much larger increase in government debt relative to the temporary injection, whereas the reversed fiscal injection implies a much smaller increase in debt. Thus, simple measures of the fiscal cost of reducing the output gap clearly favour a temporary or reversed fiscal stimulus.

***And additional simulations...***

These simulations results are for a model calibrated for the US economy, but variant simulations summarised in Appendix 3.3 suggest they are robust, or even strengthened, for alternative parameter settings. For example, variant simulation results suggest that:

***... either confirm these results ...***

- The model can be calibrated more in line with a typical large European economy, so that (relative to the United States) multipliers are smaller, automatic stabilisers are larger, and the interest-rate sensitivity of activity is reduced. The results imply that national fiscal policy is generally less effective in reducing the output gap, but this mainly reflects the larger spillovers associated with a smaller economy. The relative cost advantage of temporary or reversed stimulus over a sustained stimulus remains.

***... or strengthen them if a country starts from a weak fiscal position***

- The model can also represent the case of a highly-indebted country, by replicating the previous calibration, except that the initial level of government indebtedness is set to be twice the OECD average and the responsiveness of the risk premium to expected deficits is doubled. The debt cost of a sustained stimulus is substantially increased and the output gains, relative to either a

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40. The “temporary” fiscal injection in this example is maintained at 3% of GDP for two years, but should be seen in the context of the assumed magnitude and length of the *ex ante* adverse shock, and is labelled as temporary to distinguish it from the other policy responses.

temporary or reversed stimulus, substantially reduced. This illustrates that the cost of fiscal action is much higher for highly-indebted countries.

***The appropriate fiscal response thus varies across countries***

In summary, the simulation exercises suggest that, for countries which do not start out with a weak initial fiscal position, fiscal policy can play an important role in cushioning the downturn when monetary policy is constrained. This suggests that for those countries starting from a strong initial fiscal position, some further action may be warranted, even if automatic stabilisers effects are relatively large. For others, action will only be warranted if the outlook turns out to be much weaker than expected.

***Commitment to medium-term sustainability remains a key issue***

The need to minimise adverse financial market reaction and so enhance the effectiveness of any discretionary fiscal action underlines the importance of a credible medium-term framework, backed by political commitment, to ensure fiscal sustainability. In this respect, it is encouraging that some OECD countries that have adopted discretionary fiscal stimulus measures have also made announcements relating to sustainability over medium horizon.<sup>41</sup> Among the major countries, some recent examples include the following:

- In the United States, President Obama has pledged to cut the federal deficit in half by the end of his first term, although it has yet to be framed in any formal fiscal rule.
- In Japan, with the aim of stabilising and decreasing the debt ratio by the mid-2010s, the government has explicitly committed to implement comprehensive tax reform, including a hike in the consumption tax rate, in three years, contingent on economic recovery actually taking place.
- In Germany, along with the second stimulus package, there were announcements of a debt repayment plan for some part of the additional debt incurred and the intention to introduce a new fiscal rule, anchored in the constitution, that sets the limit of a structural budget deficit to a maximum of 0.35% of GDP for the central government from 2016 onwards and would require balanced budgets for the *Länder* by 2020.

**Co-ordination and spillovers**

***Fiscal stimulus has important spillover effects...***

The high degree of synchronicity of the current downturn raises the issue of the extent to which fiscal stimulus responses should be co-ordinated. Fiscal stimulus will have international spillover effects both through trade and interest rate channels. The former will be relatively more important in smaller more open economies where the multiplier effects of

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41. For instance, although fiscal packages of six OECD countries (out of the sample of 29 OECD countries) resulted from relaxation of existing fiscal policy, eight countries have also made simultaneous announcement of measures aiming to restore fiscal sustainability over the medium to long-run.

domestic policy action are correspondingly weaker due to import leakage, whereas with integrated capital markets global interest rate effects per dollar of stimulus are expected to be similar in smaller and larger countries. The possible scale of positive trade spillover effects from the discretionary fiscal packages so far announced/implemented can be gauged from simulations of the OECD's global model (Hervé *et al.*, 2009): figures on the diagonals of Table 3.7 provide an estimate of the "own-country" effects of the stimulus packages whereas off-diagonal figures provide an estimate of spillover effects. The largest spillover effects result from the US fiscal package, amounting to about ¼ per cent of OECD GDP in 2010 (comparing the final two columns of Table 3.7) which is due mainly to the large absolute size of the US fiscal package. However, in relative terms a larger share of the euro area and 'other OECD' fiscal packages -- about one-third and one-half, respectively -- lead to spillovers rather than own-country stimulus. Effects on the level of GDP are greater in 2010 than 2009, partly because the model suggests that second year multipliers tend to increase.

Table 3.7. **Own-country/region and spillover effects from fiscal packages**

	US	Japan	Euro area	Other OECD	Total OECD	Of which <sup>1</sup> "own country"
GDP effects, % differences from baseline: 2009						
United States	<b>1.41</b>	0.24	0.12	0.31	<b>0.68</b>	<b>0.56</b>
Japan	0.01	<b>0.39</b>	0.01	0.02	<b>0.09</b>	<b>0.07</b>
Euro area	0.05	0.06	<b>0.52</b>	0.11	<b>0.18</b>	<b>0.13</b>
Other OECD	0.08	0.10	0.14	<b>0.53</b>	<b>0.18</b>	<b>0.09</b>
Total OECD	<b>1.55</b>	<b>0.78</b>	<b>0.76</b>	<b>0.95</b>	<b>1.11</b>	
GDP effects, % differences from baseline : 2010						
United States	<b>2.36</b>	0.37	0.26	0.54	<b>1.15</b>	<b>0.93</b>
Japan	0.02	<b>0.45</b>	0.01	0.02	<b>0.10</b>	<b>0.07</b>
Euro area	0.08	0.08	<b>0.53</b>	0.16	<b>0.20</b>	<b>0.13</b>
Other OECD	0.13	0.11	0.12	<b>0.65</b>	<b>0.26</b>	<b>0.11</b>
Total OECD	<b>2.60</b>	<b>1.03</b>	<b>0.99</b>	<b>1.32</b>	<b>1.70</b>	

Notes: The table reports the effect of simulating the fiscal packages summarised in table 3.1 using the OECD's global model. Interest rates are held constant at baseline values in all simulations.

1. "Own country" effect corresponds to the "own country" multiplier weighted by its share in OECD GDP.

Source: OECD.

**... although these need to be qualified**

There are, however, a number of important qualifications to these simulation results. Firstly, the implied multipliers are somewhat higher than those used to evaluate the packages in Figure 3.4, particularly because no specific adjustment has been made to the OECD global model to reflect the current circumstances which may tend to increase savings propensities.<sup>42</sup>

42. Typically own-country GDP effects of the fiscal packages are 0.1-0.2% higher in the model simulation than when evaluated using the reference multipliers shown in Figure 3.4, although there is a larger difference for the second-year own-country GDP effect in the United States which is ¾ percentage point higher according to the model simulation than when evaluated using the reference multiplier.

Secondly, it is assumed that there is no increase in interest rates in 2009-10 as a consequence of the fiscal stimulus, whereas if interest rates did increase this would also tend to dampen multiplier effects both at home and abroad, involving partially offsetting negative spillover effects. Further fiscal actions would raise positive trade spillover effects, but also increase the likelihood of an adverse reaction from interest rates.

***There are potential  
benefits from co-  
ordination***

These qualifications notwithstanding, the simulations illustrate the importance of spillovers. Co-ordination of fiscal actions could help internalise spillover effects and so lead to a potentially better global response than if each country acted alone. In practice, explicit co-ordination may be difficult to achieve with the needed urgency, partly because spillover effects, especially from interest rates, are difficult to identify. Thus co-ordinated action, to the extent it takes place, may tend to be of an implicit character, for example by establishing benchmarks for desired stimulus. Co-ordination would not, however, loosen the constraints for fiscal action in those countries which start from a very weak fiscal position.

**APPENDIX 3.1:  
METHODOLOGICAL PRINCIPLES IN MEASURING FISCAL PACKAGES**

***Data on fiscal packages include...***

In computing data on fiscal packages reported in the main text,<sup>43</sup> consistent methodology has been applied across OECD countries. Because this methodology may differ from the one commonly used in individual countries, data referred to in the OECD documentation may depart from those widely communicated by national governments and the media. The main principles adopted in defining and measuring the size of fiscal packages in this chapter are as follows:

***... discretionary crisis-related measures...***

- Fiscal packages include discretionary measures implemented and/or announced in response to the crisis up to 24 March 2009. Although fiscal packages are expansionary in most OECD countries, restrictive discretionary measures have also been taken as a response to the crisis and are included. In a few countries, the overall package is restrictive (in particular Hungary, Iceland and Ireland). Changes in fiscal balances resulting from automatic stabilisers are not included. Discretionary measures which cannot be considered as a response to the crisis, even if they are implemented over the period 2008 to 2010, are also excluded from the definition of fiscal packages. As an illustration, tax cuts decided in 2006 or 2007 but implemented over the period 2008-2010 in Denmark, France, Poland and Spain are not included, although they have contributed to cushion the economic downturn. Similarly, discretionary measures resulting from a constitutional court decision (*e.g.* Germany) are not included. It should be acknowledged, however, that defining whether a discretionary measure has been adopted as a response to the crisis involves sometimes an element of judgment.

***... relative to a “no-crisis-related-action scenario”...***

- The overall size of fiscal packages is measured as the deviation of fiscal balances compared with a “no-crisis-related-action scenario” over the period 2008-10. As an example, were a temporary tax relief to be implemented in 2009, the loss in tax revenues resulting from this measure would be recorded in 2009. If the same tax relief is considered as permanent, or if the government has not announced *ex ante* if and when the measure will be reversed, then the loss in tax revenues is recorded for both 2009 and 2010. And the overall size of the fiscal package for the period 2008-10 reflects the loss of revenue in both 2009 and 2010.

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43. Details of fiscal packages for each OECD country are available on the Economic Outlook page on the OECD website ([www.oecd.org/oecdEconomicOutlook](http://www.oecd.org/oecdEconomicOutlook)).

***... recorded on national accounts principles...***

- The size of a fiscal package reflects only those measures with a direct and immediate impact on general government balances, following national accounts principles. This implies, in particular, that fiscal packages do not reflect changes in investment by public enterprises (*e.g.* France) nor actions initiated by central banks, because public enterprises and central banks are not included in the general government sector. Changes in the timing of payment of either tax liabilities and/or government liabilities are not included insofar as they do not affect spending and revenues measured on accrual basis (*i.e.* the basis used for national accounting).<sup>44</sup> Similarly, the granting of loans and guarantees by the government as well as the acquisition of equities, bonds and loans issued by the corporate sector have no immediate impact on the fiscal balance.<sup>45</sup>

***... for calendar years...***

- Data are recorded on a calendar year and accrual basis, as far as possible.

***... and general government...***

- The data concern, as far as possible, the consolidated general government, *i.e.* the central government, state governments, local governments and social security funds. Information on sub-national governments' response to the crisis is, however, not available for several countries. In particular, data provided for Belgium, Canada and the United States do not include sub-national government measures.

***... broken down by main revenue and spending categories***

- Spending and revenue measures have been broken down, to the extent possible, by main categories so as to allow drawing consistent cross-country comparisons on the composition of fiscal packages. On the revenue side, these categories are: taxes on individuals; business taxes; consumption taxes; social security contributions; and others (positive numbers signal tax cuts). On the spending side, the categories are: general government consumption and investment; transfers to households; transfers to businesses; transfers to sub-national governments, and other spending measures (positive numbers signal spending increases). Consolidated general government accounts should not record "transfers to sub-national governments". However, getting consolidated data has been difficult for some countries and this required recognising such transfers. It should be noted, however, that such an approach risks introducing a bias when assessing the

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44. Several countries (including Belgium, France and Spain) have made efforts to reduce payment delays on government procurement or changed the timing of tax liabilities. These measures have not been included when assessing the size of fiscal packages.

45. Loans granted by the general government sector and the acquisition of equities and bonds are reflected in the government balance sheet (as an increase in both assets and gross debt), though with no impact on net debt. Guarantees are off-balance sheet as long as they are not called. See Box 1.4. of the *OECD Economic Outlook No. 84* for further details on how these operations are recorded in the OECD set of projections.



composition of fiscal packages. Since adjustments in transfers to sub-national governments may ultimately be used to finance specific spending projects and/or aim at avoiding pro-cyclical tax increases, the composition of fiscal packages on a consolidated basis would be different from the one shown here for some countries.

**APPENDIX 3.2:**  
**DETAILED MULTIPLIERS BY COUNTRY AND BY INSTRUMENT**

Table 3.8 shows the multipliers by country and by instrument used to evaluate the fiscal packages. High estimates are based on the survey of results described in Box 3.1 adjusted only for openness, as measured by the ratio of imports to GDP plus imports. Reference estimates are further judgementally adjusted for the effect that the current conjuncture is likely to have on increasing saving propensities. For further details, see Box 3.1.

**Table 3.8. Multipliers used to evaluate the fiscal packages**

	Openness in 2008 <sup>1</sup>	Spending increases												Tax cuts							
		Government consumption				Government investment				Transfers to household				Personal Income tax				Indirect tax			
		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2		Year 1		Year 2	
		Ref.	High	Ref.	High	Ref.	High	Ref.	High	Ref.	High	Ref.	High	Ref.	High	Ref.	High	Ref.	High	Ref.	High
USA	15.4	0.7	0.7	0.8	1.1	0.9	0.9	1.1	1.3	0.5	0.5	0.8	0.9	0.3	0.5	0.5	0.9	0.2	0.3	0.3	0.5
JPN	14.7	0.7	0.7	0.8	1.1	0.9	0.9	1.1	1.3	0.5	0.5	0.8	0.9	0.3	0.5	0.5	0.9	0.2	0.3	0.3	0.5
DEU	29.5	0.4	0.4	0.5	0.8	0.8	0.8	1.0	1.2	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.7	0.1	0.2	0.2	0.4
FRA	22.5	0.6	0.6	0.7	1.0	0.8	0.8	1.0	1.2	0.4	0.4	0.7	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
ITA	22.5	0.6	0.6	0.7	1.0	0.8	0.8	1.0	1.2	0.4	0.4	0.7	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
GBR	23.9	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
CAN	25.2	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.7	0.2	0.4	0.4	0.7	0.1	0.2	0.2	0.4
AUS	19.5	0.6	0.6	0.7	1.0	0.9	0.9	1.1	1.3	0.4	0.4	0.7	0.8	0.3	0.4	0.4	0.8	0.2	0.3	0.3	0.5
AUT	35.2	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.3	0.6	0.1	0.1	0.2	0.3
BEL	47.9	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
CZE	41.8	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
DNK	34.8	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.3	0.6	0.1	0.1	0.2	0.3
FIN	28.9	0.4	0.4	0.5	0.8	0.8	0.8	1.0	1.2	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.7	0.1	0.2	0.2	0.4
GRC	25.1	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.7	0.2	0.4	0.4	0.7	0.1	0.2	0.2	0.4
HUN	44.7	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
ISL	32.6	0.4	0.4	0.5	0.8	0.7	0.7	0.9	1.1	0.3	0.3	0.5	0.6	0.2	0.3	0.3	0.6	0.1	0.2	0.2	0.3
IRL	41.4	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
KOR	36.4	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
LUX	59.0	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
MEX	23.1	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
NLD	41.1	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
NZL	25.1	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.7	0.2	0.4	0.4	0.7	0.1	0.2	0.2	0.4
NOR	23.0	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4
POL	30.0	0.4	0.4	0.5	0.8	0.8	0.8	1.0	1.2	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.7	0.1	0.2	0.2	0.4
PRT	29.3	0.4	0.4	0.5	0.8	0.8	0.8	1.0	1.2	0.3	0.3	0.5	0.7	0.2	0.3	0.3	0.7	0.1	0.2	0.2	0.4
SVK	45.7	0.3	0.3	0.4	0.7	0.7	0.7	0.9	1.1	0.2	0.2	0.4	0.6	0.1	0.2	0.2	0.6	0.1	0.1	0.1	0.3
ESP	24.8	0.5	0.5	0.6	0.9	0.8	0.8	1.0	1.2	0.4	0.4	0.6	0.7	0.2	0.4	0.4	0.7	0.1	0.2	0.2	0.4
SWE	31.7	0.4	0.4	0.5	0.8	0.7	0.7	0.9	1.1	0.3	0.3	0.5	0.6	0.2	0.3	0.3	0.6	0.1	0.2	0.2	0.4
CHE	31.8	0.4	0.4	0.5	0.8	0.7	0.7	0.9	1.1	0.3	0.3	0.5	0.6	0.2	0.3	0.3	0.6	0.1	0.2	0.2	0.4
TUR	22.5	0.6	0.6	0.7	1.0	0.8	0.8	1.0	1.2	0.4	0.4	0.7	0.8	0.2	0.4	0.4	0.8	0.2	0.2	0.2	0.4

Note: High estimates are based on survey results adjusted only for openness. Low estimates are further judgementally adjusted for the effect of the current conjuncture.

1. Openness is measured as ratio of imports to GDP plus imports.

Source: OECD.

**APPENDIX 3.3:**  
**SIMULATION MODEL TO ILLUSTRATE THE STIMULUS -- INTEREST RATE NEXUS**

This appendix describes the model used to generate the model simulations described in the main paper. The model is based on a reduced form equation for the output gap where real short-term and long-term interest rates enter separately as explanatory variables, based on the work by Guichard *et al.* (2009). This equation is augmented with a calibrated effect from fiscal policy, using the same multipliers that are used to evaluate current fiscal packages based on a review of the literature regarding fiscal multipliers summarised in Appendix 3.2. The other key equation is that for long-term interest rates which are determined as a forward sum of model-consistent expectations of short-term nominal interest rates over the future 10 years plus a risk premium which is related to the average expected fiscal deficit over the next five years. The model is completed with a Taylor-rule for short-term policy rates, a Phillips curve for inflation, and various identities to complete the government accounts.

A reduced form output gap equation

$$(1) \quad \text{GAP} = -\alpha_1(L) (r^s - r^{s*}) - \alpha_2(L) (r^l - r^{l*}) + \text{FSHK} + \text{fiscal}$$

where

- GAP = output gap
- $r^s$  =  $i^s - \pi$  = real short-term policy interest rate, where  $i^s$  is the nominal policy interest rate and  $\pi$  is the inflation rate.
- $r^{s*}$  = steady state equilibrium real short-term policy interest rate.
- $r^l$  =  $i^l - \sum \pi^e$  = real long-term interest rate on government bonds, where  $i^l$  is the nominal interest rate on 10-year government bonds and  $\sum \pi^e$  is the forward sum of model-consistent expectations of inflation over the future 10 years.
- $r^{l*}$  = steady state equilibrium real long-term interest rate.
- FSHK = other components of financial conditions, treated as exogenous and to which a negative shock is applied to simulate the effect of the financial crisis.
- fiscal = multiplier effect of fiscal policy on the output gap.

The effect of interest rates on the output gap is calibrated according to Guichard *et al.* (2009) which suggests that the effect of a given change in long-term rates is about three times the size of an effect on short-term rates and that interest rate effects are larger in the United States and United Kingdom than the euro area and Japan.

Multiplier effects from fiscal policy

$$(2) \quad \text{fiscal} = \gamma_1(L) \Delta g + \gamma_2(L) \Delta \text{tax} + \gamma_2(L) \mu \Delta \text{GAP}$$

where  $g$  = government spending as a share of GDP.  
 $\text{tax}$  = taxes as a share of GDP.

$\gamma_1(L)$ ,  $\gamma_2(L)$  are lag polynomials which over the first two years reflect the effects of fiscal multipliers surveyed in Appendix 3.2. Beyond the second year they are assumed to decay at an annual rate of 10% per annum. The  $\mu \text{GAP}$  term reflects the operation of automatic stabilisers. The coefficient reflecting the magnitude of automatic stabilisers,  $\mu$ , is based on Girouard and André (2004) and for the average OECD country is 0.44.

A Phillips curve inflation equation

$$(3) \quad \pi = \theta_1 \pi^* + (1 - \theta_1) \pi_{-1} + \theta_2(L) \text{GAP}$$

where  $\pi$  = inflation  
 $\pi^*$  = long-term expected inflation, set equal to the implicit/explicit inflation target of the central bank.

If  $\theta_1 = 0$ , then inflation expectations are entirely backward looking, but if  $\theta_1 > 0$  then the central bank's inflation target provides some anchor for inflation expectations. For the simulations reported here  $\theta_1 = 0.2$ .  $\theta_2(1) = 1/6$ , implying a sacrifice ratio of 6 if expectations are backward-looking.

A Taylor rule for policy interest rates

$$(4) \quad i^s = \pi + r^{s*} + 1.0 (\pi - \pi^*) + 1.0 \text{GAP}$$

Term structure of interest rates

$$(5) \quad i^l = \sum i^s + \text{term} + \text{risk}$$

where  $\sum i^s$  = the forward sum of model-consistent expectations of short-term nominal interest rates over the future 10 years.  
 $\text{term}$  = term premium, assumed exogenous.  
 $\text{risk}$  = risk premium, assumed to be a function of the expected fiscal position (see below).

Risk premium on interest rates

$$(6) \quad \text{risk} = \lambda (b_{+5} - b)^e / 5$$

where  $(b_{+5} - b)^e / 5$  is the average (model-consistent) expected change in government debt (as a share of GDP) which proxies for the average expected fiscal balance over the next 5 years. The parameter  $\lambda$  is set equal to 0.25 in the base simulation based on Laubach (2005), and doubled in a variant simulation.

Government primary fiscal balance (as % of GDP)

$$(7) \quad \text{pbal} = \text{tax} - g + \mu \text{GAP}$$

Net interest payments on government debt (as % of GDP)

$$(8) \quad \text{ipay} = \psi \text{ipay}_{-1} + (1 - \psi) i^l \cdot b$$

where  $\psi$  is the proportion of the government debt stock that is re-financed each year.

Government fiscal balance (as % of GDP)

$$(7) \quad \text{fbal} = \text{pbal} - \text{ipay}$$

Government bond stock (as % of GDP)

$$(9) \quad b = [(1 + ib^l) / (1 + \pi + g)] \cdot b_{-1} - \text{pbal}$$

where  $g = \Delta\text{GAP} + \rho =$  real GDP growth rate, where  $\rho$  is the potential growth rate, assumed exogenous.

$ib^l = \text{ipay}/b =$  effective average long-term interest rate paid on government debt.

In the simulations, after about 30 years (*i.e.* well beyond the simulation discussed) the bond stock as a share of GDP is stabilised using a simple rule for taxes, which at this point are assumed to be lump-sum and to not affect activity.

***Variant simulations***

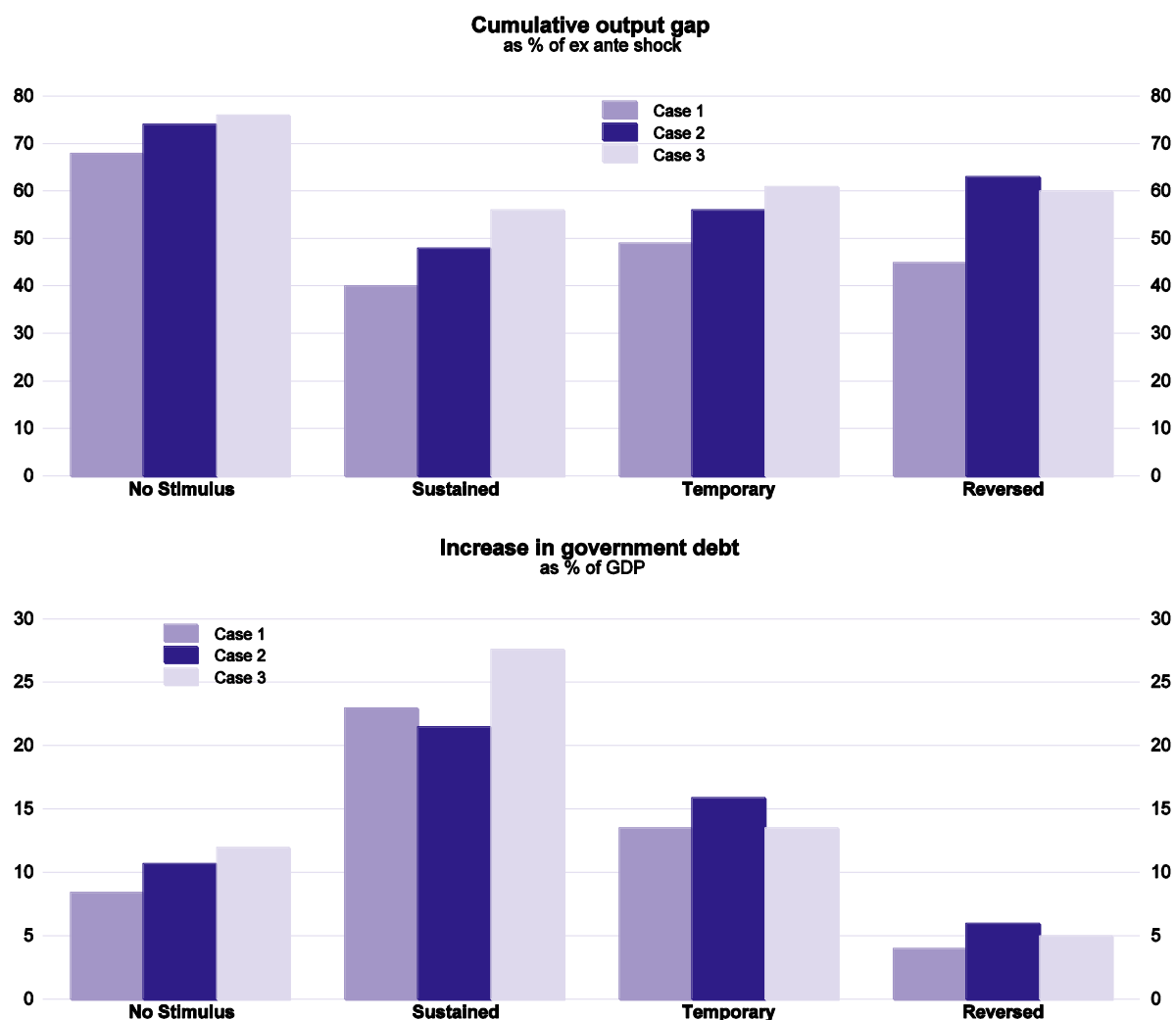
Figure 3.10 and Table 3.9 summarise the results of variant simulations discussed in the main text. The same set of fiscal shocks are simulated for three different model parameterisations characterising three different OECD economies.

Table 3.9. **Variant simulation details**

	Case 1	Case 2	Case 3
Interest rate sensitivity	High	Average	Average
Automatic stabilisers	Low	Average	Average
Multiplier	High	Average	Average
Risk premium sensitivity	Moderate	Moderate	High
Initial level of debt	Moderate	Moderate	High

Source: OECD.

Figure 3.10. Model simulation results for alternative fiscal stimulus profiles



Note: The charts summarise the results of the simulated responses to a large negative shock for four different profiles of the fiscal stimulus (none, sustained, temporary and reversed) for three different country cases with the characteristics outlined in Table 3.9.

Source: OECD.

**APPENDIX 3.4:  
FISCAL POLICY EFFECTS IN A DSGE MODEL**

***Model description***

The model is characterised by monopolistic product markets and encompasses a heterogeneous household sector (with Ricardian and liquidity-constrained households), and employment and investment adjustment costs.<sup>46</sup> As such, the model draws extensively on pre-existing DSGE models (Smets and Wouters, 2003; Ratto *et al.*, 2009). However, contrary to previous models the feed-back effects of public finance variables (deficit and/or public debt) on government bond rates are explicitly modelled, allowing an examination of effects of a fiscal package on the debt pattern through interest rate movements. This mechanism is important to capture the trade-off between the short-term effectiveness of fiscal policy to counter the downturn and the long-term sustainability risks it entails.

***Multiplier values***

Fiscal multipliers have been calculated by simulating a 1% of GDP increase in different spending measures and a 1% rate cut in wage, capital and consumption taxes. The simulations have been undertaken, under the assumption that monetary policy cannot be used to support demand and a fiscal rule is imposed to ensure long-term sustainability of public debt. Although these assumptions alter the pattern of public debt, their effect on the size of fiscal multipliers is limited.

A stronger short-term GDP impact is found for an increase in public investment, as the latter also have also a marked positive supply-side effect (Table 3.10). An increase in public consumption would also sustain activity

Table 3.10. **Short-term multipliers based on a DSGE model**

	Effect on activity the first year (per cent)
<b>1% of GDP increase in :</b>	
Government consumption	0.6
Government investment	1.0
Transfer to liquidity-constrained households	0.3
<b>1% increase in :</b>	
Consumption tax rate	0.2
Wage tax rate	0.7
Capital tax rate	0.05
<i>Source:</i> Furceri and Mourougane (2009)	

46. See Furceri and Mourougane (2009) for more details on the model specifications and calibration.

by a significant amount, while a transfer to liquidity-constrained households would have a more limited aggregate impact. Tax cuts would be on average less effective to sustain demand than spending measures, with the strongest effect found for a tax cut on wage income. Indeed the latter would lead to a more pronounced fall in real wage and thus more employment creation than other tax cuts.

These results are robust to a change in calibration of the structural parameters. Although the results are qualitatively robust and can provide insights on the relative effectiveness of each fiscal instrument, point estimates of short-term multipliers should be interpreted with caution given the stylised features of the model.

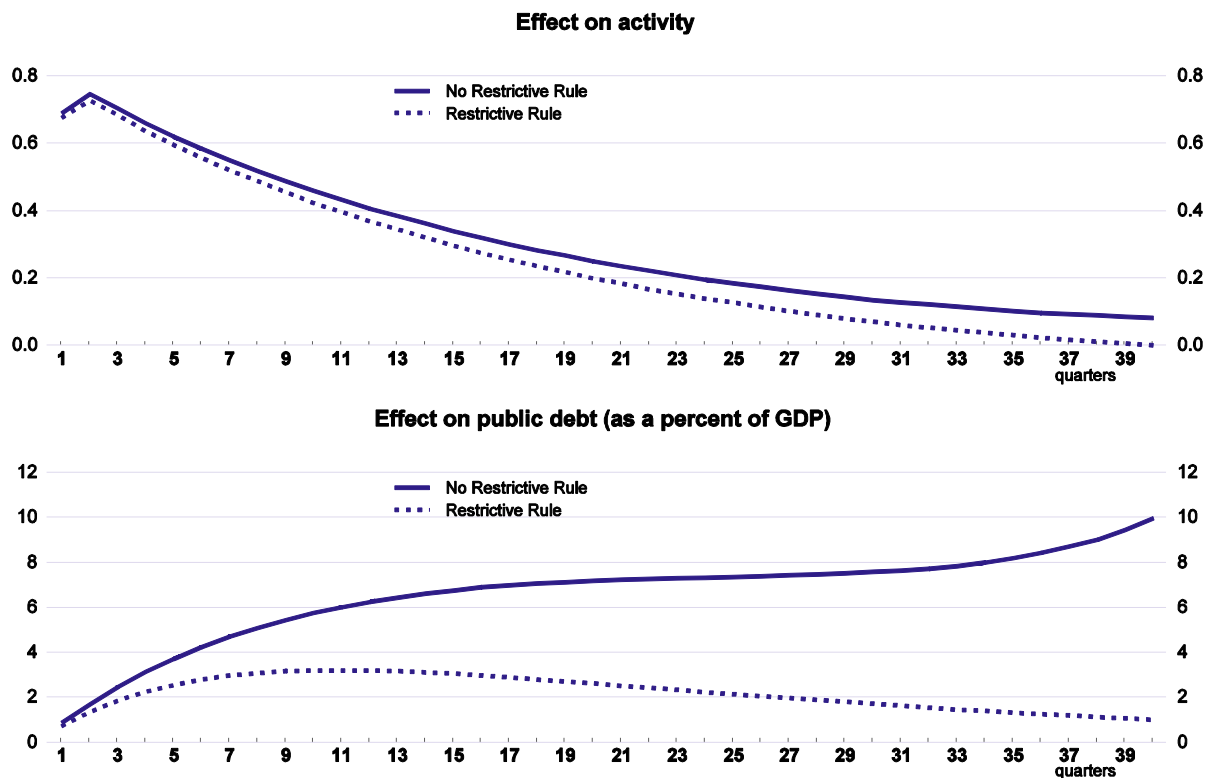
*The trade-off between short-term stimulus and long-term fiscal sustainability*

Although fiscal policy is an effective tool to counter economic downturns, its use also entails risks regarding the long-term sustainability of public finances. Indeed, the financing of discretionary policy measures is likely to increase the risk premium associated with government bonds and in turn augment debt refinancing costs. The rise in the risk premium will also impinge negatively on activity, though to a small extent.

As an illustration, a DSGE-based simulation of a temporary 1% of GDP increase in government consumption leads to a continuous increase in public debt in the absence of a stringent fiscal rule (Figure 3.11). In this scenario,

**Figure 3.11. Impact of 1% of GDP increase in public consumption**

%, compared to baseline



Source: Furceri and Mourougane (2009).



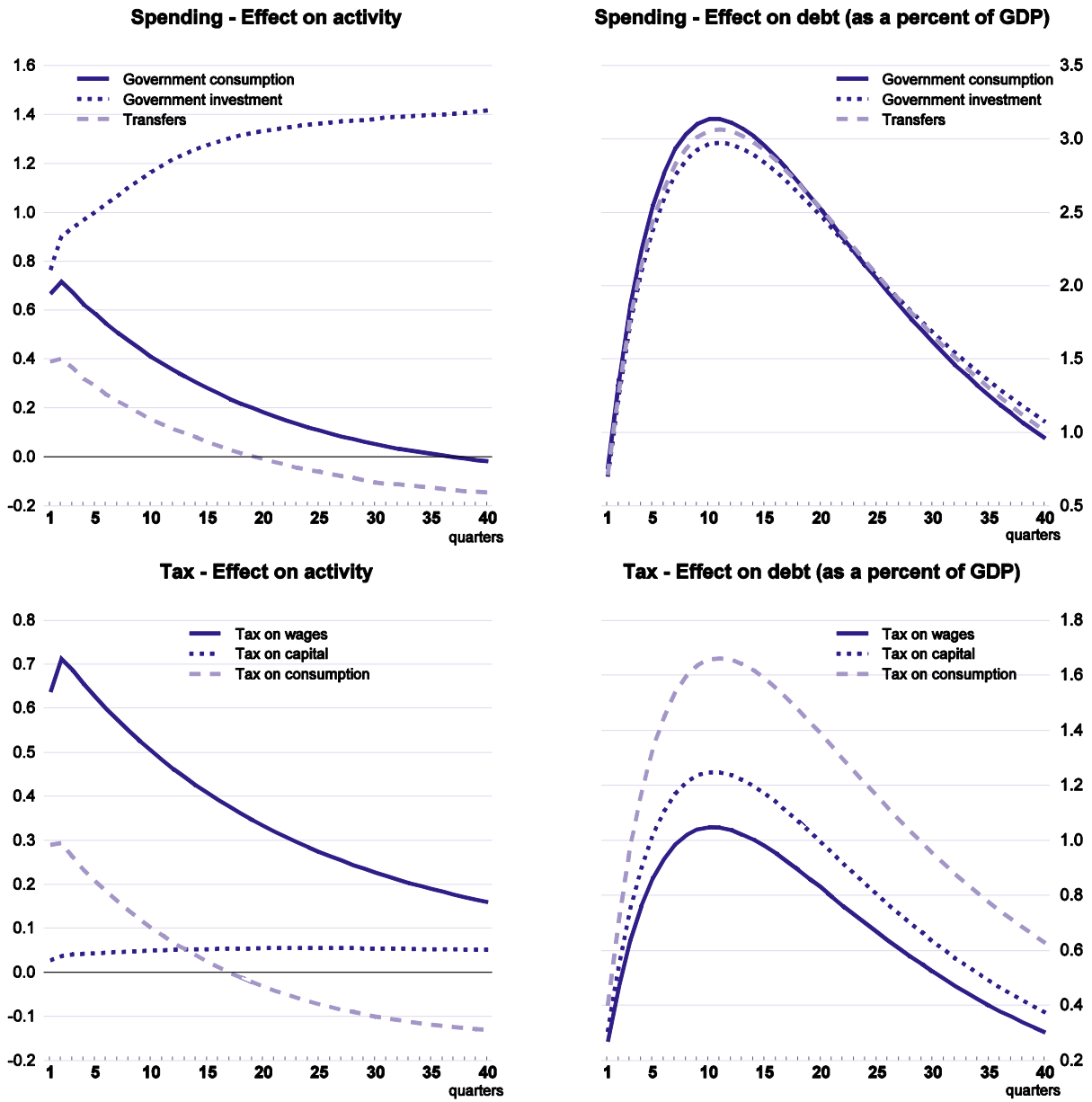
fiscal policy sustains demand through a hefty rise in liquidity-constrained household consumption in the short-term. The monetary policy interest rate increases, as the output gap rises and inflation edges up, mitigating the initial effect of fiscal policy and the public deficit gradually deteriorates. The risk premium on government bonds rises, contributing to a steady creeping up in debt.

Imposing a stringent fiscal rule is found to be relatively costless in terms of foregone activity to ensure that debt returns to a sustainable path over the medium term. This could be achieved for instance through an increase in lump sum taxes, which lowers the fiscal stimulus, but limits the extent of the deficit deterioration. As a result, the rise in debt would be muted, with a debt increase amounting to half its level in the baseline scenario after a year. The introduction of such a rule would have a limited effect on the size of the short-term fiscal impulse on activity.

The debt implication of a fiscal impulse varies with the instrument used. To illustrate this point, a 1% of GDP increase in government consumption, investment and transfers and a 1% rate cut in wage, consumption and capital taxes have been simulated, under the assumption of an ineffective monetary policy and the imposition of a stringent fiscal rule. Amongst the revenue instruments, the largest debt increase is associated with a consumption tax cut (Figure 3.12). By contrast, a wage tax cut would lead to a subdued rise in debt. On the spending side, the rise in net debt following an increase in government investment would be less pronounced than in the case of a government consumption increase.

Figure 3.12. Impact of selected fiscal policy shocks on activity and public debt

%, compared to baseline



Source: OECD.

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