

Fiscal Consolidation During a Depression

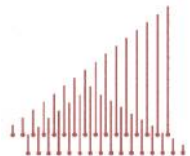
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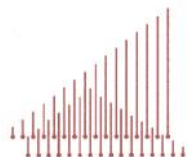
October 2012

Project LINK Meeting on the World Economy



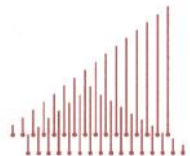
Introduction

- With no consolidation plans, debt in many EU economies would be on an unsustainable path
- Timing of fiscal programme matters
 - Consolidation is always contractionary
 - During a depression, negative impacts are amplified
- Presentation extends paper on the UK to consider synchronised consolidation across Europe
 - What is the economic impact?
 - Is it self-defeating?
 - How important are fiscal spillovers?



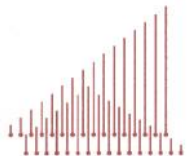
Outline of presentation

- Analysis based on simulation using the National Institute Global Econometric Model (NiGEM)
 - Overview of key features of NiGEM model
- What determines the fiscal multiplier?
- Does the state of the economy affect the multiplier?
- How does the fiscal position affect sovereign bond yields?
- Assessment of planned fiscal consolidation programmes, 2011-2013 for 12 EU economies



NiGEM Overview

- NiGEM is a large-scale structural econometric model of the world economy
 - Discrete models for 40 countries and 6 regional blocks for the remaining countries
- Country Linkages
 - trade and competitiveness
 - interacting financial markets
 - international stocks of assets
- Endogenous policy rules for interest rates and fiscal solvency
- Rational expectations options
 - Financial markets
 - Exchange rates
 - Long rates
 - Equity prices
 - Labour markets
 - Consumption
- Exogenous labour force



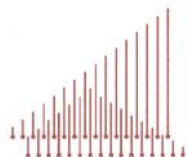
GDP

- In the short- to medium-term, GDP is driven by the demand side

$$Y = C + I + GC + GI + XVOL - MVOL$$

- In the longer term, GDP is governed by the supply side

$$YCAP = \chi [uK^{-\dots} + (1-u)(Le^{\text{techl}})^{-\dots}]^{-(1-r)/\dots} M^r$$

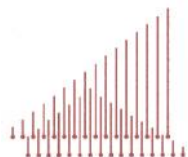


Consumption

- Consumption depends on (a dynamic adjustment path around) real personal disposable income and wealth.

$$d \ln(C_t) = \left\{ \ln(C_{t-1}) - [a + b_0 \ln(TAW_{t-1}) + (1 - b_0) \ln(RPDI_{t-1})] \right\} \\ + b_1 d \ln(RPDI_t) + b_2 d \ln(NW_t) + b_3 d \ln(HW_t)$$

- Short-term income elasticity of consumption (b_1) captures liquidity constraints
- RPDI depends on TAX



Government sector

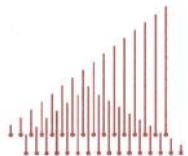
- Government sector has 3 revenue sources and 4 expenditure categories:

- $BUD = (GC + GI) * PY + TRAN + GIP - TAX - CTAX - MTAX$

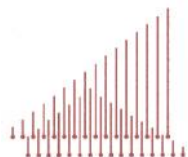
- Income tax (TAX)
- Corporate tax (CTAX)
- Indirect tax/VAT (MTAX)
- Consumption (GC)
- Investment (GI)
- Social transfers to households (TRAN)
- Interest payments (GIP)

- The deficit flows onto the debt stock, after allowing for money finance:

- $DEBT = DEBT_{t-1} - BUD - \Delta M$

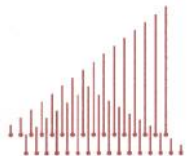


- **Short-term interest rates set by a central bank**
 - Feedback rules depend on (+T for Target)
 - Inflation (INFL), Output gap (Y/YCAP),
 - Price level (PL), Nominal Aggregate (NOM)
- **Two Pillar Strategy**
 - Interest rate = $c^*(INFL-INFLT)+d^*(NOM-NOMT)$
- **Long-term interest rates are forward looking – the forward convolution of expected short rates**

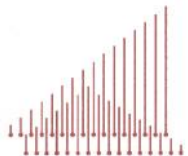


What determines the size of the fiscal multiplier?

- **Multipliers differ across countries**
 - Openness
 - Access to liquidity
 - Size
 - Independent monetary policy?
 - Speed of adjustment in labour market
 - Inflation anchor
- **Multipliers differ within countries**
 - Instrument
 - Monetary policy response
 - Expectation formation



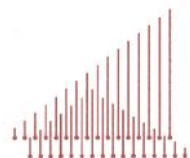
- Why are multipliers generally less than 1?
 - Import leakages
 - Looser monetary policy, exchange rate
 - Consumption/investment channels adjusts gradually and offset through savings



Baseline Fiscal Multipliers

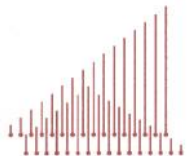
Table 2. Key factors determining cross-country differences in multipliers

	Temporary spending multiplier	Temporary income tax multiplier	Import penetration	Income elasticity
Austria	-0.52	-0.13	0.50	0.23
Belgium	-0.62	-0.12	0.80	0.17
Finland	-0.61	-0.06	0.39	0.00
France	-0.67	-0.27	0.30	0.51
Germany	-0.48	-0.26	0.39	0.68
Greece	-1.35	-0.53	0.34	0.48
Ireland	-0.36	-0.08	0.72	0.17
Italy	-0.63	-0.13	0.27	0.14
Netherlands	-0.59	-0.20	0.70	0.23
Portugal	-0.73	-0.11	0.38	0.08
Spain	-0.81	-0.11	0.37	0.00
United Kingdom	-0.54	-0.09	0.29	0.17
United States	-0.92	-0.19	0.16	0.15
Spending correlation			0.43	-0.12
Tax correlation			0.22	-0.73

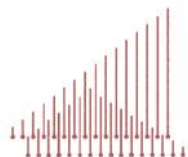


Assumptions underlying baseline multipliers

- Innovations are temporary
- Central bank sets interest rates to stabilise inflation (no boundary issues)
- Financial markets are “rational”
 - Long-term interest rates
 - Equity prices
 - Exchange rates
- Consumers are myopic
- Liquidity constraints/propensity to save are “normal”
- Government borrowing premium is exogenous

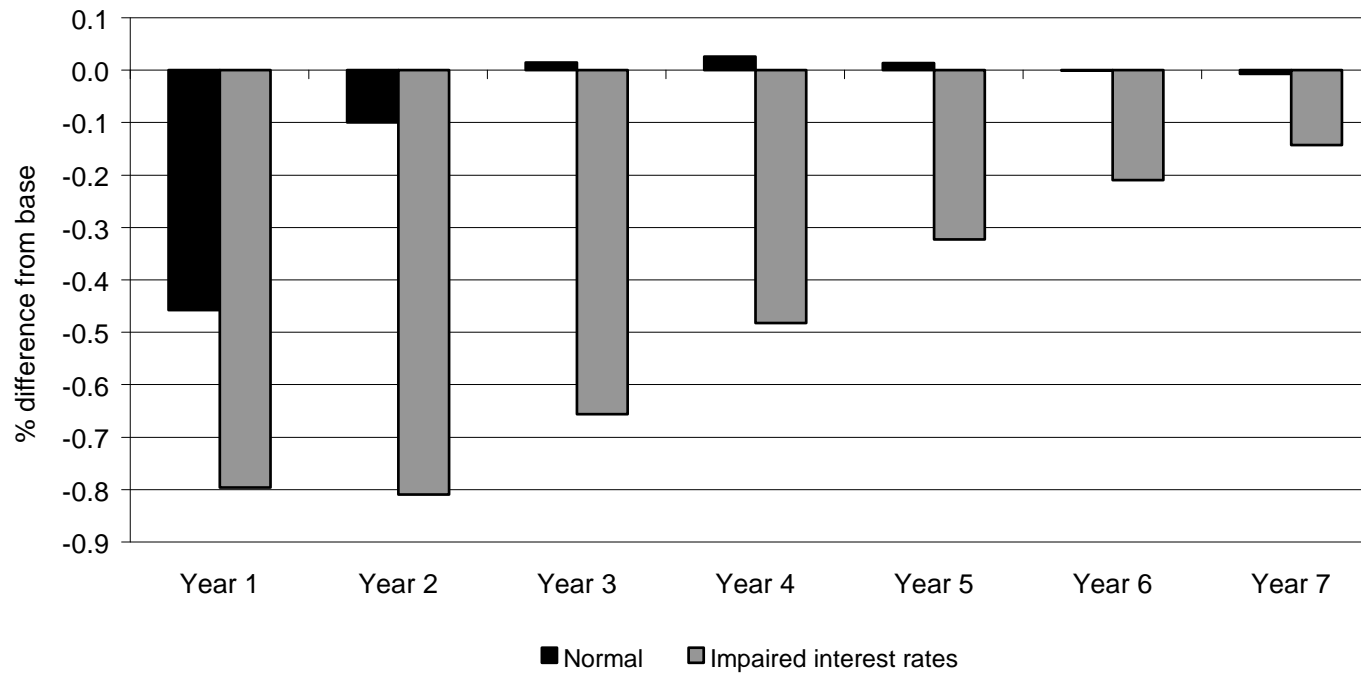


- Recent studies suggest multipliers may be more pronounced when the economy has suffered a prolonged downturn
 - Delong and Summers (2012), Auerbach and Gorodnichenko (2012), IMF (2012), and others
- Channels of transmission?
 - Interest rates and the zero lower bound
 - Impaired banks and heightened liquidity constraints
 - Hysteresis (not covered in this presentation)

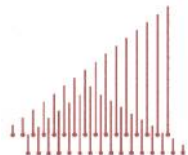


Impaired interest rate channel

Figure 3. Impact of an impaired interest rate adjustment on GDP



Notes: Impact on the level of GDP of a 1% of GDP fiscal spending consolidation (permanent) in the UK, with and without an interest rate response.

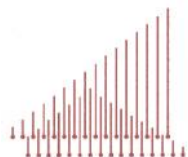


Heightened liquidity constraints

$$d \ln(C_t) = \} \{ \ln(C_{t-1}) - [a + b_0 \ln(TAW_{t-1}) + (1 - b_0) \ln(RPDI_{t-1})] \} \\ + b_1 d \ln(RPDI_t) + b_2 d \ln(NW_t) + b_3 d \ln(HW_t)$$

Table 3. Impact of consolidation programme (tax rise) on UK GDP, under different short-term income elasticities of consumption

Model	Short-run income elasticity of consumption (b_1)	First year multiplier
1	0	-0.01
2	0.1	-0.06
3	0.2	-0.11
4	0.3	-0.15
5	0.4	-0.20
6	0.5	-0.25
7	0.6	-0.31
8	0.7	-0.36
9	0.8	-0.41
10	0.9	-0.47
11	1	-0.52



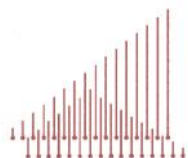
Government borrowing premia

- Several studies look at links between fiscal position and government borrowing rates
- GPREM may depend on BUD/GDP and/or DEBT/GDP
- Budget balance improves following a fiscal consolidation innovation
- Government debt/GDP may deteriorate in short-term

Table 4. Empirical relationship between government borrowing premia and fiscal variables

	Spread (t-1)	Debt to GDP ratio	Fiscal balance to GDP ratio	
				Implied long-run
Argyrou and Kontonikas (2011)	0.74		-2.0 (t+1)	-7.7
Attinasi et al (2009)	0.97		-1.6 (t+1)	-54.9
Bernoth and Erdogan (2012)		2.2	-16 (t+1)	
De Grauwe and Ji (2012)		$-6.12(t) + 0.08(t)^2$		
Schuknect et al (2010)		1.25	-12.64	

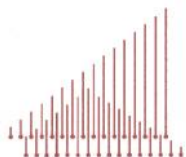
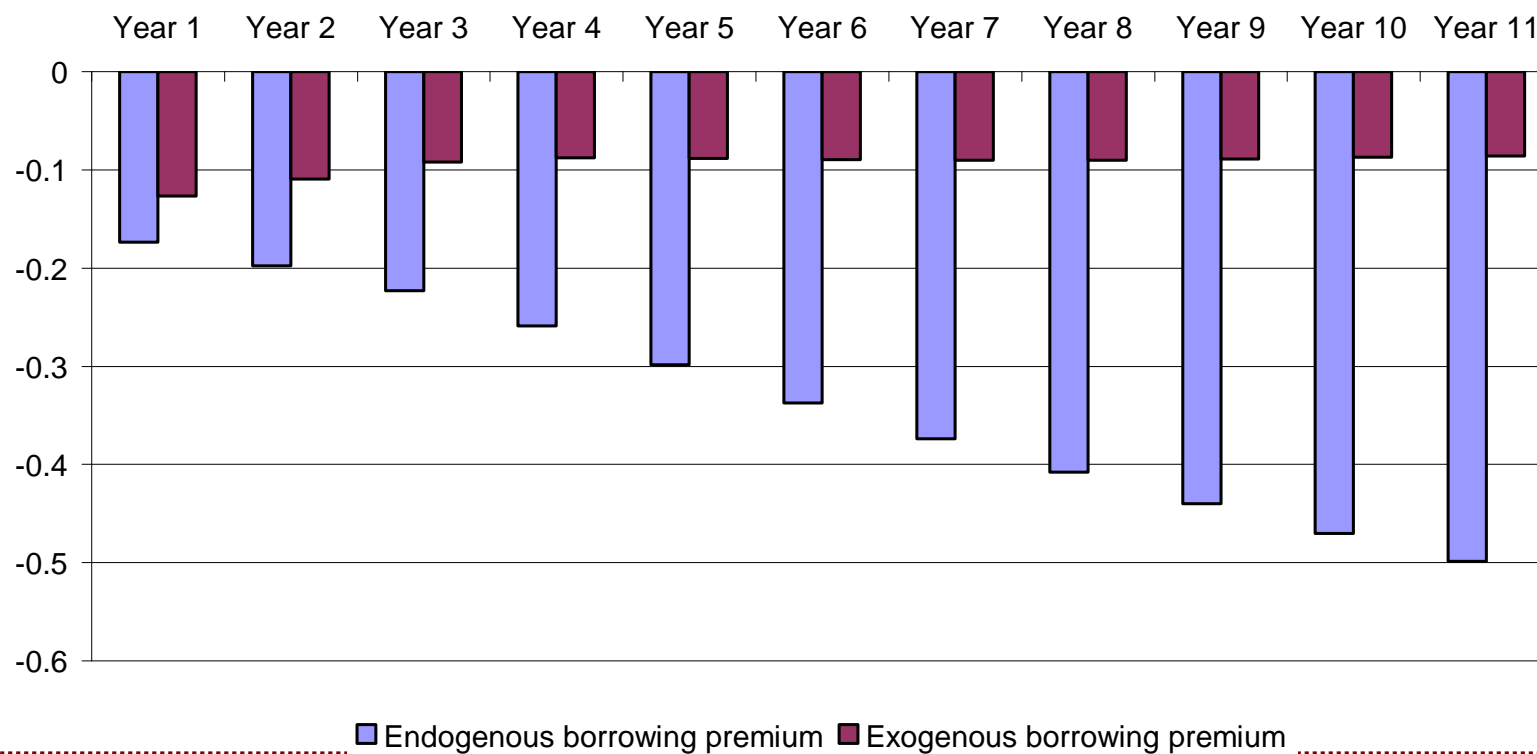
Note: Spread is defined as the 10-year government bond yield over that in Germany, expressed in basis points. (t+1) indicated expectations 1 year ahead. $(t)^2$ indicates the current debt to GDP ratio squared.



Endogenous government borrowing premium

- Let $GPREM = 0.04 * DEBT/GDP$

Figure 4. Impact of 1% of GDP fiscal consolidation in the UK on long-term interest rates

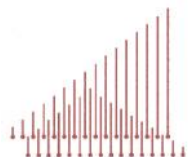


Assessing fiscal consolidation programmes 2011-2013

- **Ex-ante Net Fiscal impulses 2011-2013, as announced by governments**

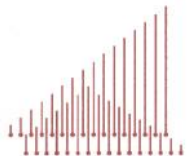
	2011			2012			2013		
	Fiscal impulse (% of 2011 GDP)	of which tax based	of which spending based	Fiscal impulse (% of 2011 GDP)	of which tax based	of which spending based	Fiscal impulse (% of 2011 GDP)	of which tax based	of which spending based
Austria	-0.9	-0.4	-0.5	-0.4	-0.2	-0.3	-0.1	0	-0.1
Belgium	-0.7	0	-0.7	-1.2	-0.5	-0.7	-1.3	-0.4	-0.9
Finland	-0.3	-0.3	-0.1	-0.6	-0.5	-0.1	-0.1	-0.1	0
France	-1.4	-1.1	-0.3	-1.7	-1.1	-0.6	-1.7	-0.8	-0.8
Germany	-0.5	-0.2	-0.3	-0.2	0	-0.2	-0.1	-0.1	0
Greece	-2.7	-1.2	-1.5	-5.1	-3.5	-1.6	-2	-0.9	-1.1
Ireland	-3.4	-0.9	-2.5	-2.4	-1	-1.4	-2.1	0.7	-1.4
Italy	-0.5	-0.3	-0.2	-3	-2.4	-0.6	-1.5	-0.6	-0.9
Netherlands	-0.8	-0.3	-0.5	-0.6	-0.5	-0.1	-0.6	-0.45	-0.15
Portugal	-5.9	-2.7	-3.2	-2.1	0	-2.1	-1.9	-0.5	-1.4
Spain	-2.5	-0.5	-2	-2.1	-0.4	-1.7	-1.4	-0.3	-1.1
UK	-2.1	-1.1	-1	-1.8	-0.2	-1.6	-1	0	-1

Source: Euroframe (2012). Does not include fiscal plans introduced after January 2012.



Two scenarios

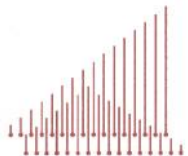
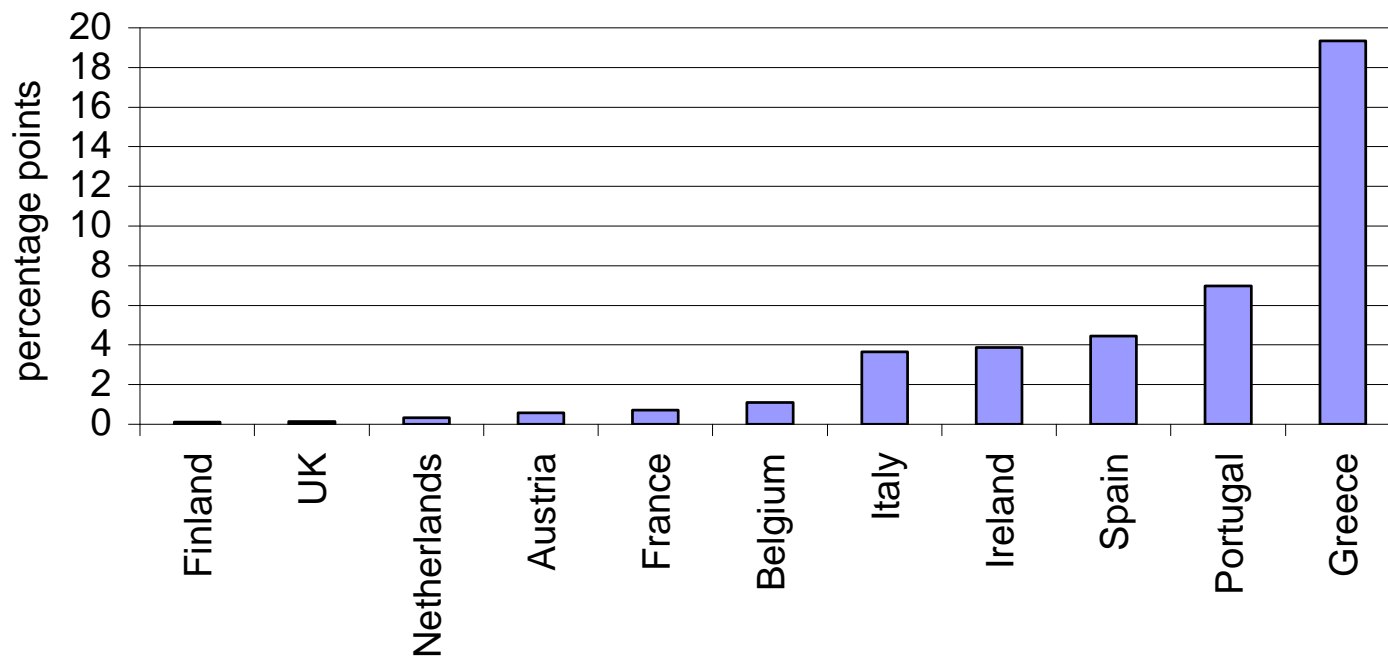
- Scenario 1 – impact of consolidation programme based on default assumptions underlying baseline multipliers
- Scenario 2 – modified assumptions to allow for:
 - Impaired interest rate channel
 - Heightened liquidity constraints



How high are liquidity constraints?

- As a proxy, use bond spreads over Germany to calibrate relative stress in banking systems

– 10-year government bond spreads over Germany, Sept 2012

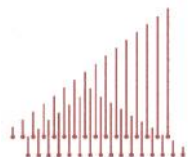


Expected impact of programmes on level of GDP

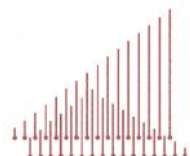
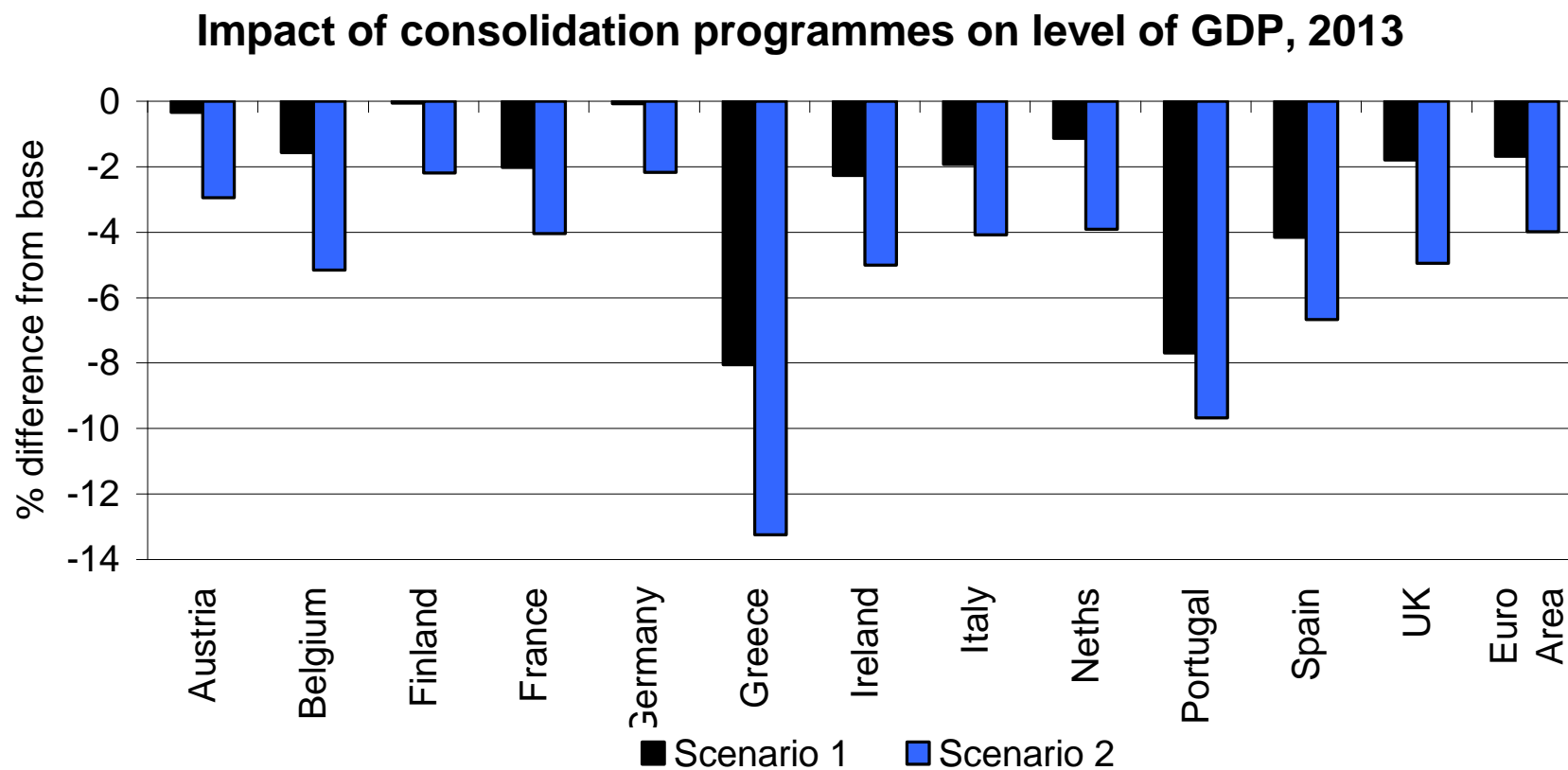
Table 6. Impact of consolidation programmes on GDP

	2011		2012		2013	
	Scenario 1	Scenario 2	Scenario 1	Scenario 2	Scenario 1	Scenario 2
Austria	-0.2	-1.0	-0.2	-2.1	-0.3	-2.9
Belgium	-0.6	-2.2	-0.7	-4.3	-1.6	-5.2
Finland	0.0	-0.9	0.1	-1.8	-0.1	-2.2
France	-0.5	-1.4	-1.1	-2.9	-2.0	-4.0
Germany	-0.1	-1.0	0.0	-1.9	-0.1	-2.2
Greece	-2.4	-4.6	-6.7	-13.0	-8.1	-13.2
Ireland	-0.9	-1.2	-1.3	-3.1	-2.3	-5.0
Italy	0.0	-0.7	-0.7	-2.6	-1.9	-4.1
Netherlan	-0.6	-1.9	-0.7	-3.3	-1.1	-3.9
Portugal	-3.2	-4.4	-5.9	-7.8	-7.7	-9.7
Spain	-1.7	-2.5	-3.2	-5.3	-4.2	-6.7
UK	-0.5	-2.2	-1.2	-4.3	-1.8	-5.0
Euro Area	-0.5	-1.5	-1.0	-3.1	-1.7	-4.0

Note: Per cent difference from base in level of real GDP

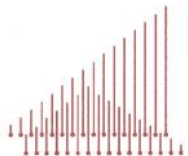
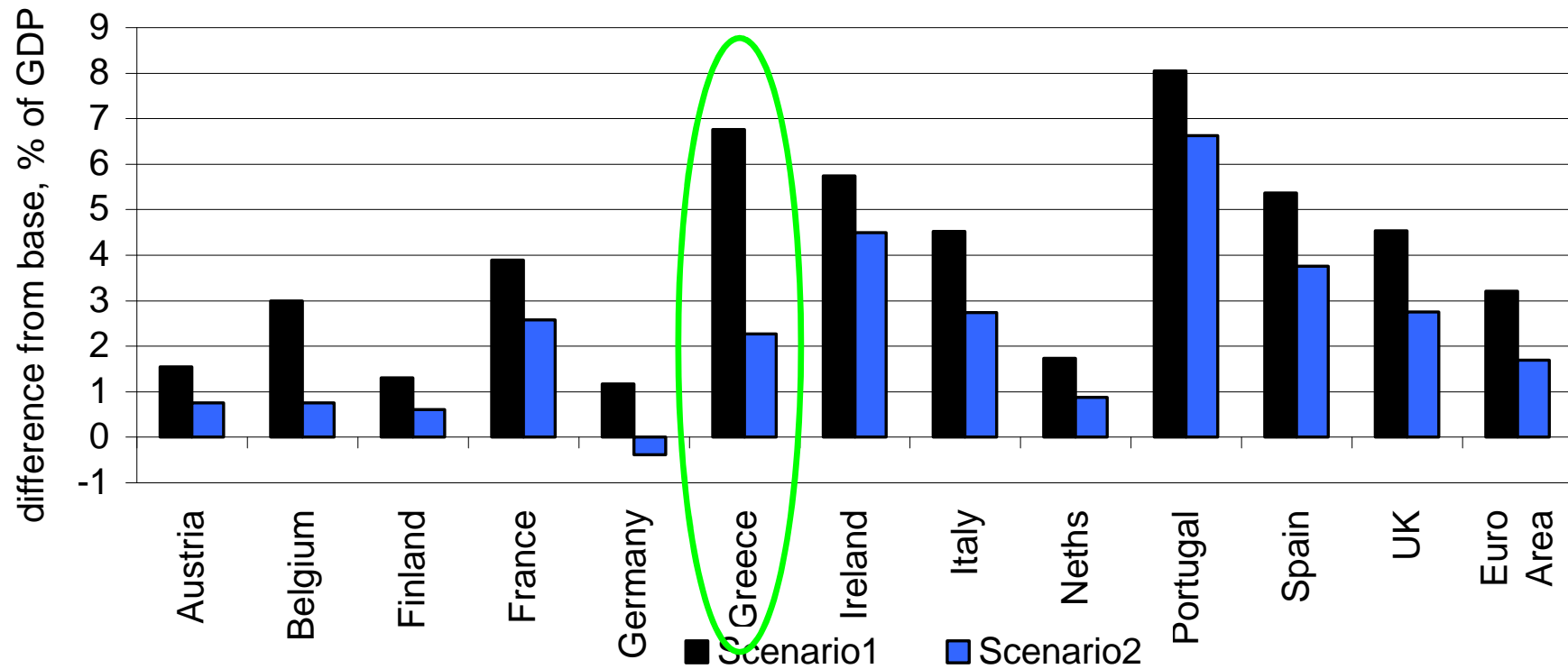


Output declines nearly double in most countries due to impaired interest rates/credit

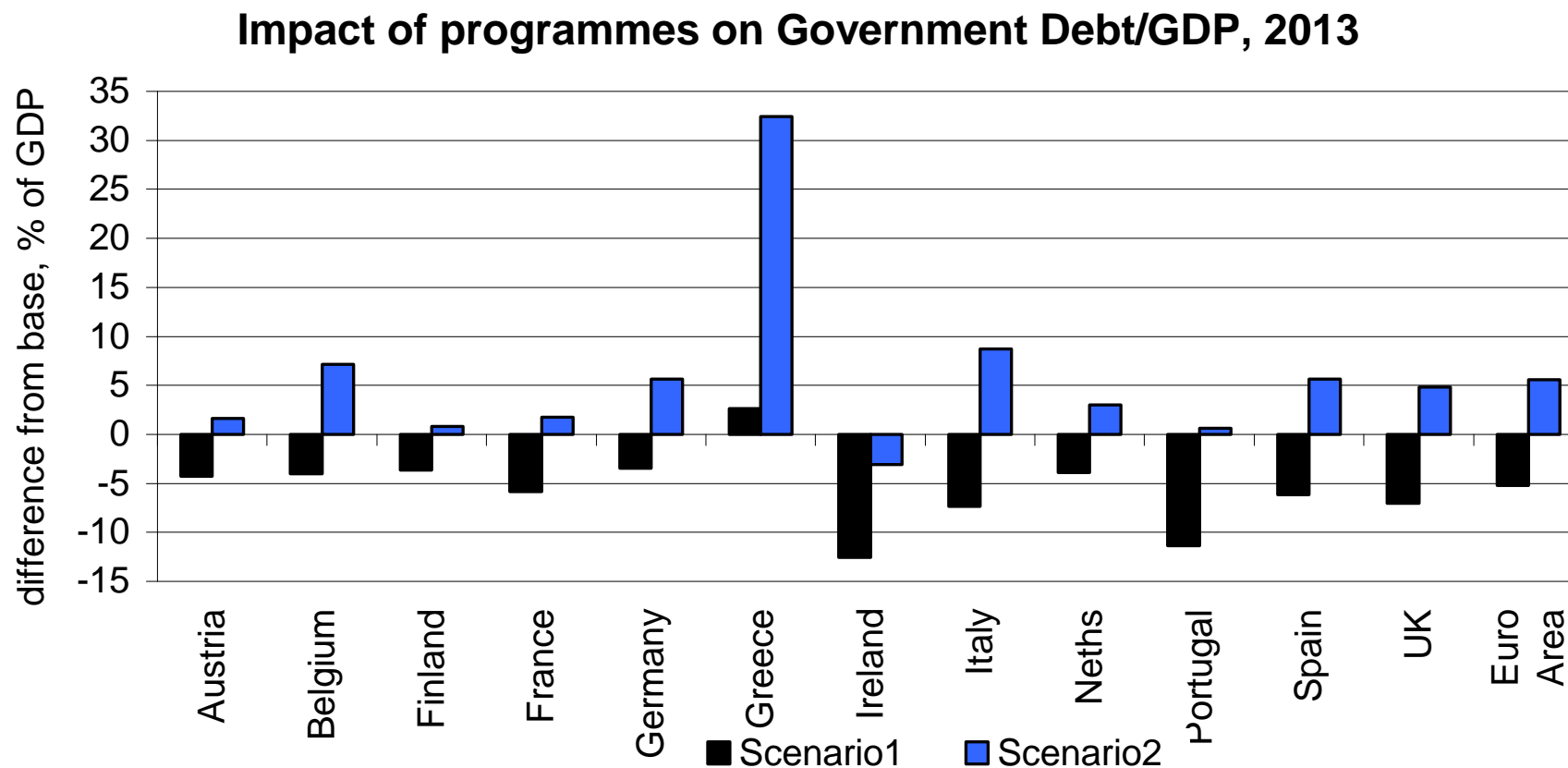


Fiscal balances improve, but not as much when output declines deepen

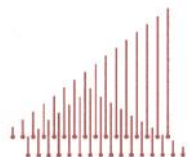
Impact of programmes on government budget balance, 2013



Perverse impact on Debt/GDP ratio with impaired transmission

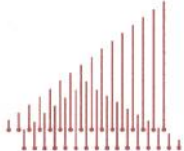
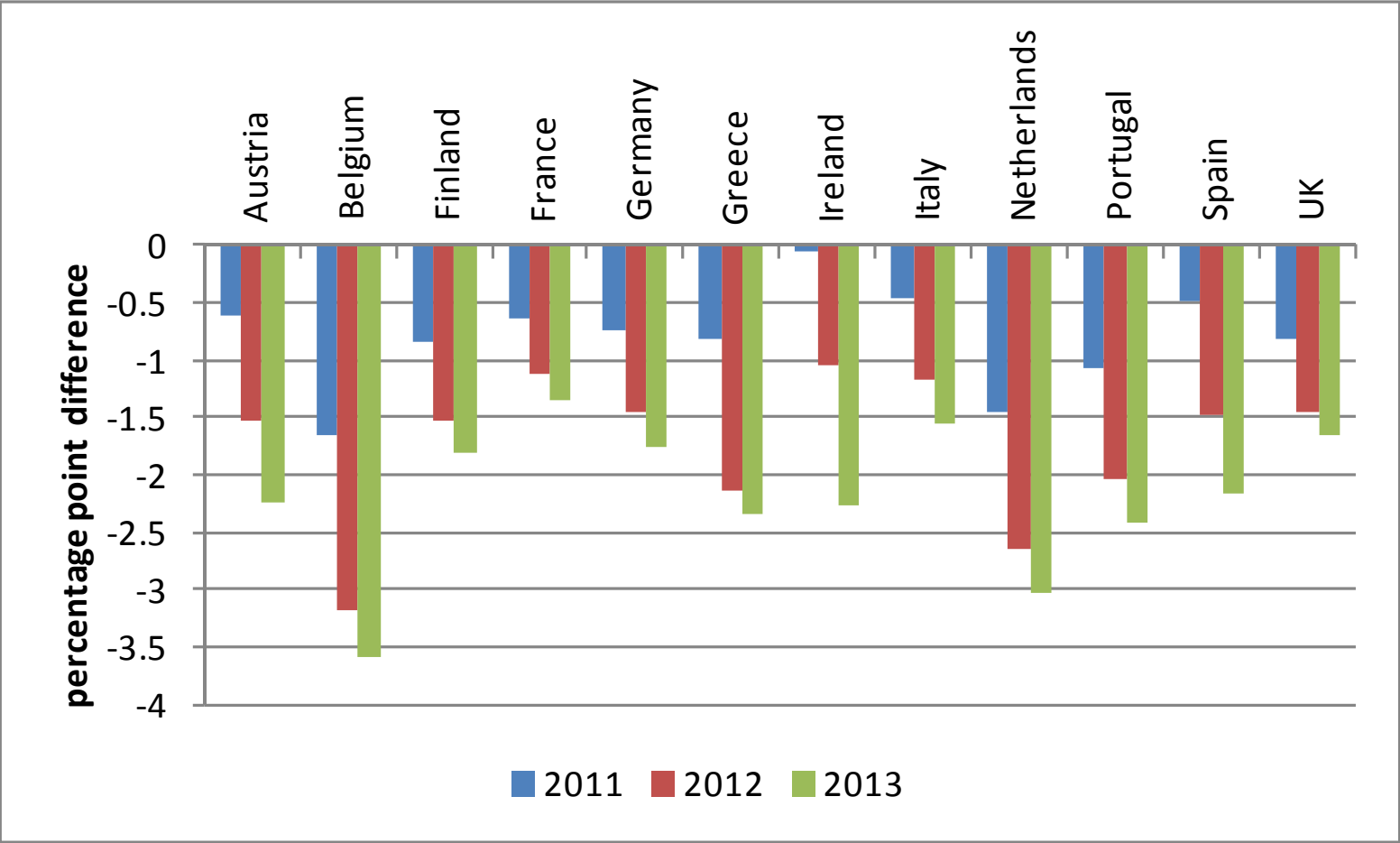


- **Feedbacks on government borrowing premia??**



How much of decline due to spillovers from simultaneous consolidation?

Impact of joint policy action relative to unilateral action

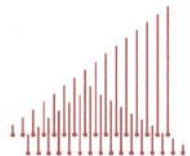


Key conclusions

- Little prospect for growth in Europe given the ongoing fiscal adjustment
- The effectiveness of consolidation measures likely to be diminished at present
- Impaired transmission mechanisms exacerbate effects on output
- Fiscal consolidation may be ‘self-defeating’ at present
- Consolidation in all countries at the same time significantly aggravates the impact
 - on average output declines by 2% by 2013 due to spillovers



Thank you



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