

Comparing fiscal multipliers across models and countries in Europe

Kilponen, Pisani, Schmidt, Corbo, Hledik, Hollmayr, Hurtado, Júlio, Kulikov,
Lemoine, Lozej, Lundvall, Maria, Micallef, Papageorgiou, Rysanek, Sideris,
Thomas, and De Walque

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This paper

- Model comparison exercise to assess the size of fiscal multipliers, considering:
 - Alternative fiscal instruments
 - Temporary vs permanent fiscal shocks
 - Role of the zero nominal interest rate bound
 - Role of selected structural features of the economy
- The comparison exercise is based on 15 macroeconomic models from NCBs and the ECB. [[List of models](#)]

Overview of participating models

- 12 models of euro area member countries (8 multi country, 4 small open economy models)
- 1 model of the euro area (NAWM)
- 2 small open economy models of non-euro area member countries
- Mostly DSGE models but sizeable differences in terms of structural specifications and parameterisations. [[details](#)]

Caveat

- Conducting a comparison of 15 (large) models with a team of 19 economists is challenging
- The granularity of the fiscal sector and the specification of fiscal stabilization policy varies a lot across models
- Models are solved and simulated using different software routines
- **Have to focus on simple and concisely defined scenarios**

Overview of simulation experiments

1. Transitory fiscal shocks

- Short-run fiscal multipliers
- The role of the zero lower bound on nominal interest rates

2. Permanent fiscal shocks

- Long-run fiscal multipliers
- Short-run multipliers and anticipation effects
- Excerpt from the sensitivity analysis: The role of liquidity constraints

Overview of simulations

1. Transitory fiscal shocks

- **Short-run fiscal multipliers**
- **The role of the zero lower bound on nominal interest rates**

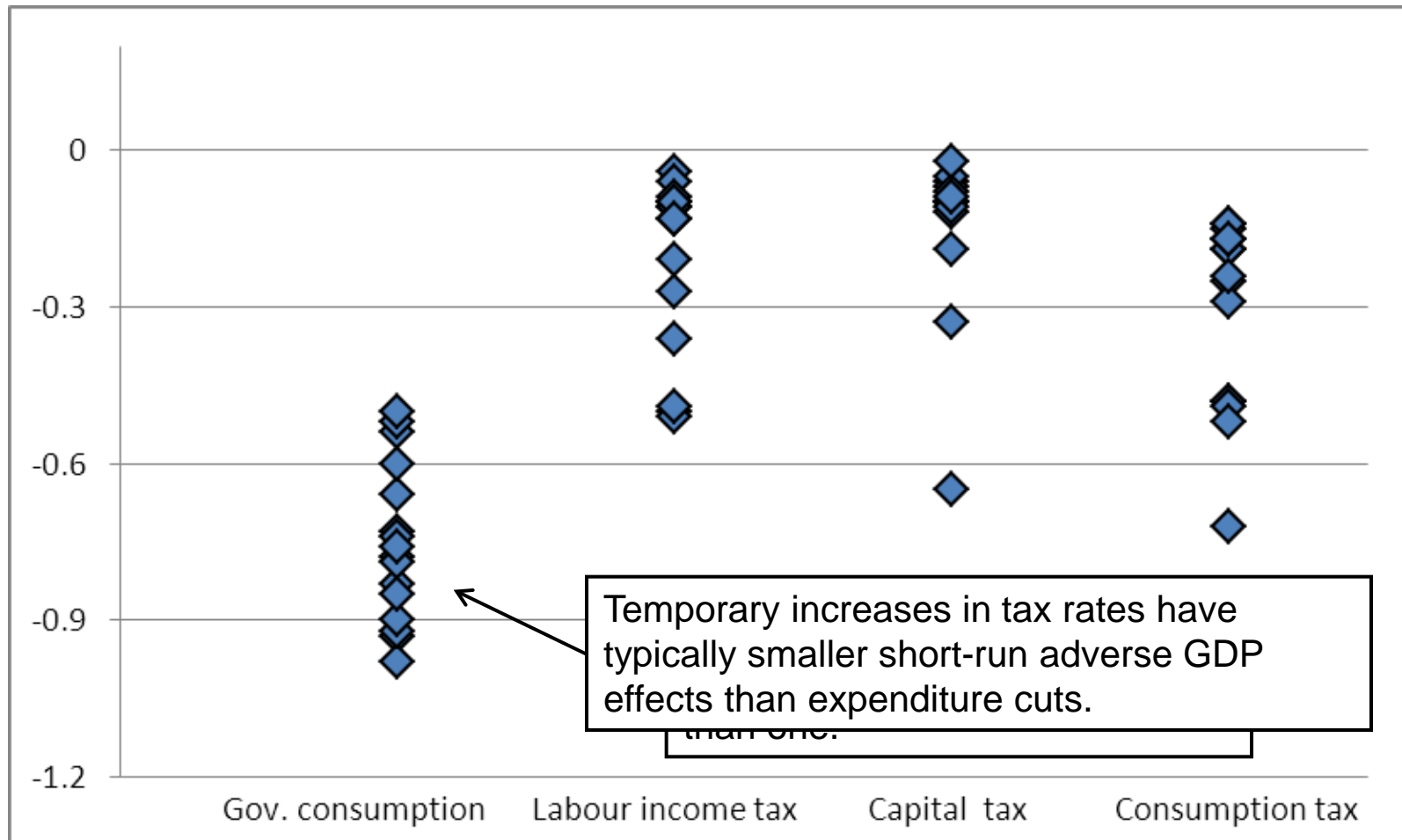
2. Permanent fiscal shocks

- Long-run fiscal multipliers
- Short-run multipliers and anticipation effects
- Excerpt from the sensitivity analysis: The role of liquidity constraints

Transitory fiscal shocks: Setup

- Reduction in public consumption (1% of GDP, 2 years)
- Increase in distortionary tax rate (1% of GDP, 2 years)
 - Labour income tax rate
 - Capital income tax rate
 - Consumption tax rate
- Fiscal rule that stabilises gov. debt is deactivated for 2 years
- All models share the same monetary policy rule
- Two monetary policy stances (active or 2-year ZLB)

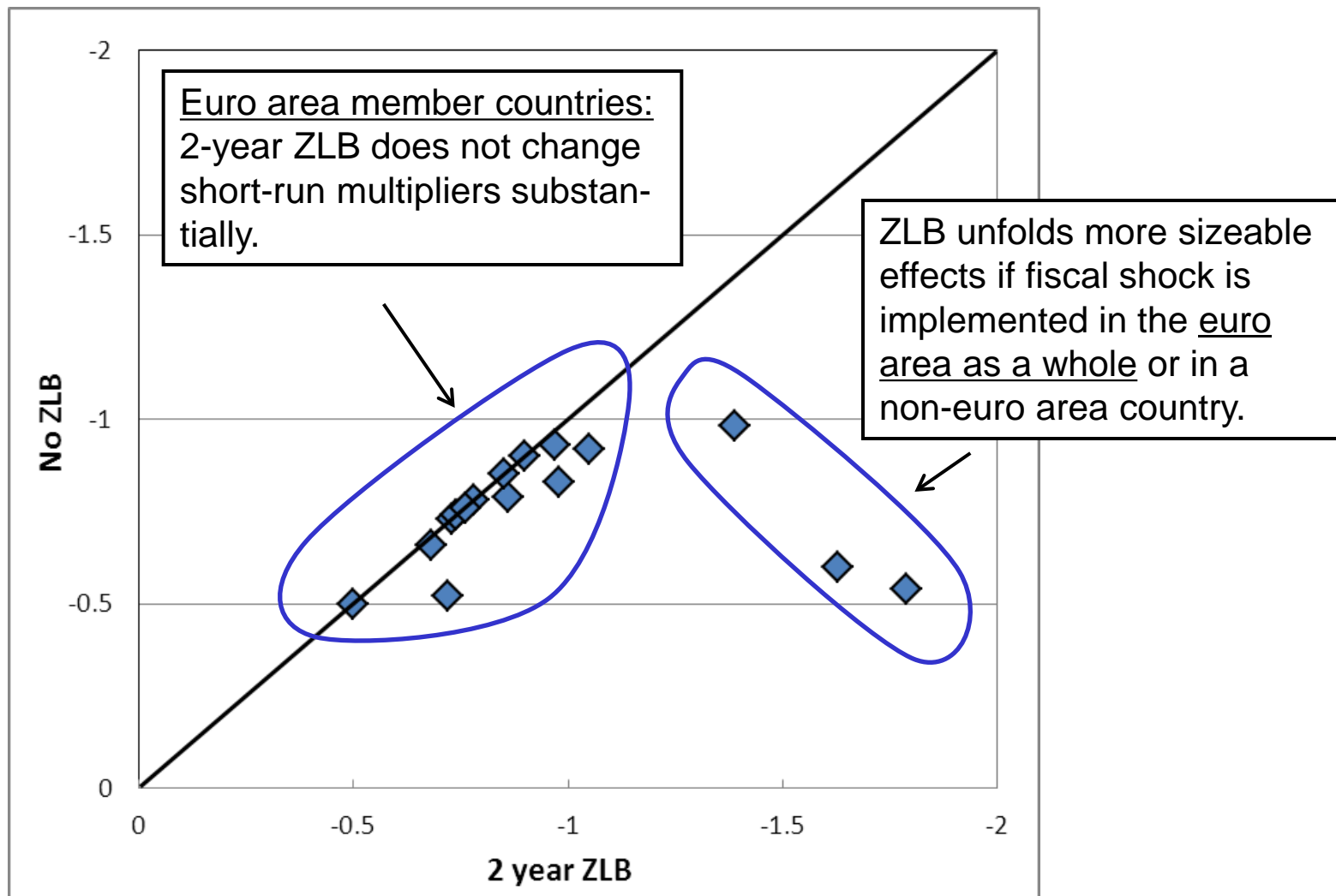
Transitory fiscal shocks: Short-run multipliers



Note: Simulations of transitory 2-year fiscal policy shocks. Shown are average multipliers for the 1st year.

[Tables]

Short-run spending multipliers: The role of the zero lower bound



Note: Simulations of transitory 2-year fiscal policy shocks. Shown are average spending multipliers for the 1st year. [\[Further results\]](#)

Overview of simulations

1. Transitory fiscal shocks

- Short-run fiscal multipliers
- The role of the zero lower bound on nominal interest rates

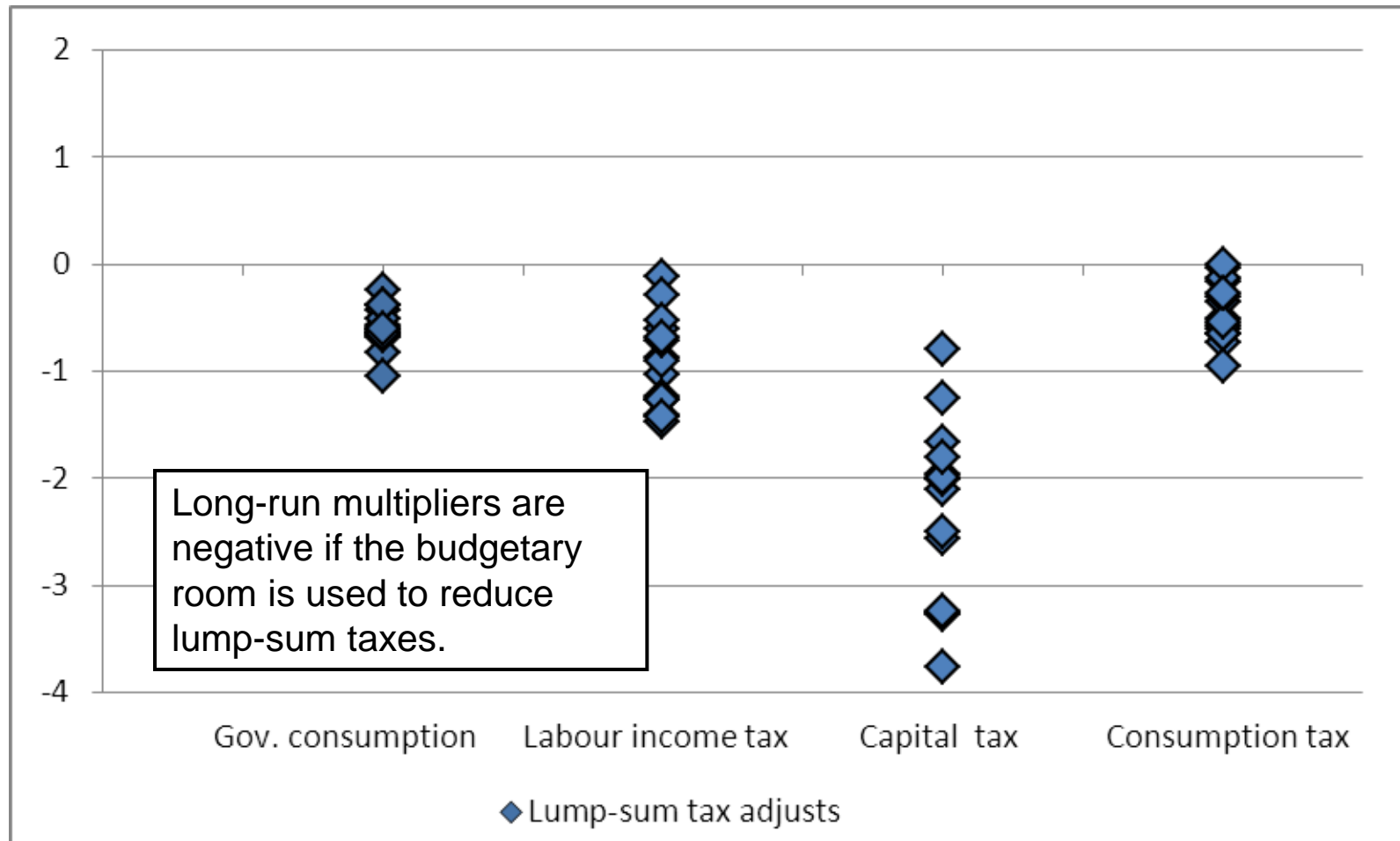
2. Permanent fiscal shocks

- Long-run fiscal multipliers
- Short-run multipliers and anticipation effects
- Excerpt from the sensitivity analysis: The role of liquidity constraints

Permanent fiscal shocks: Setup

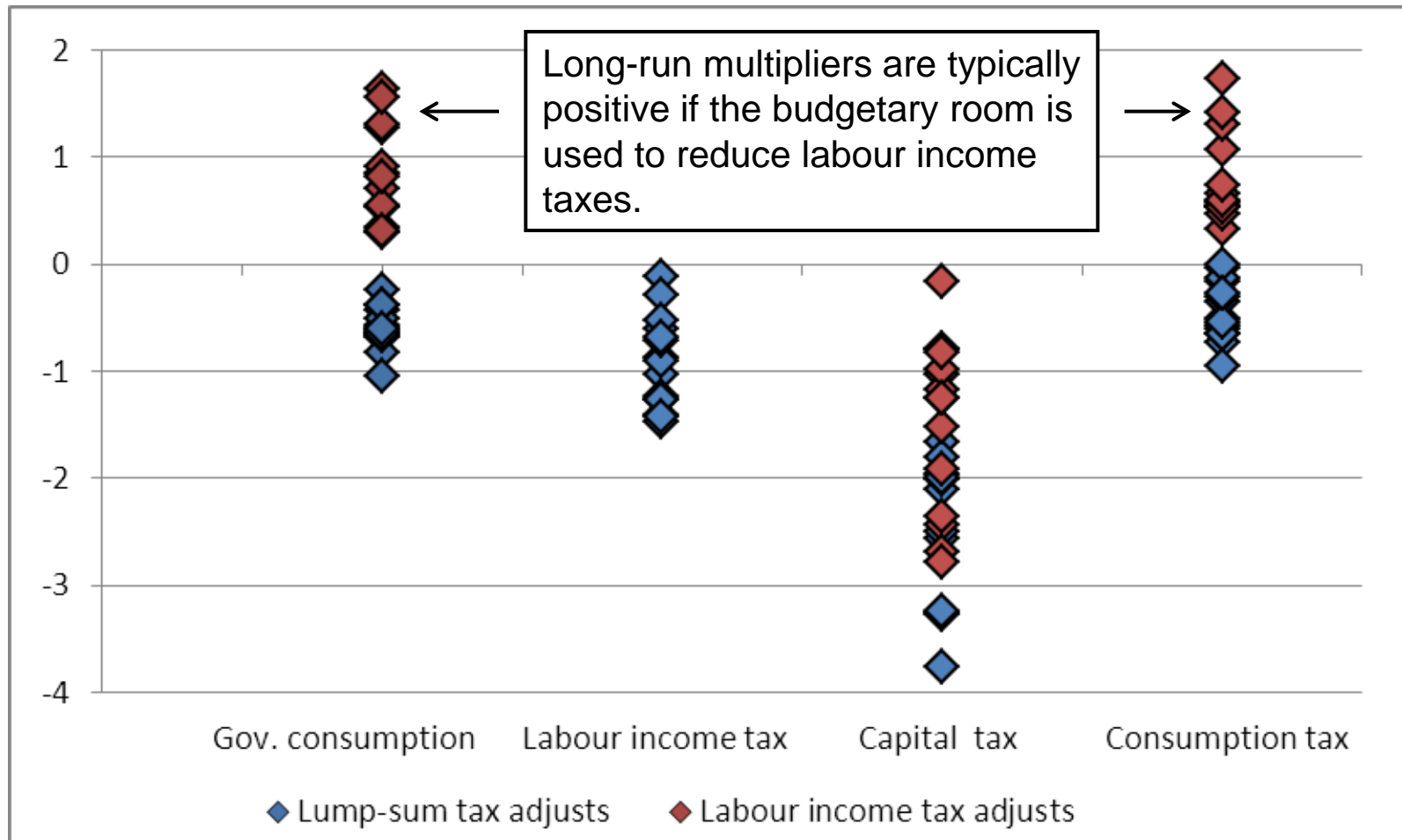
- Reduction in public consumption (1% of GDP, permanent)
- Increase in distortionary tax rate (1% of GDP, permanent)
 - Labour income tax rate
 - Capital income tax rate
 - Consumption tax rate
- Fiscal rule deactivated during the first 2 years
- Fiscal rule specified in terms of i) lump-sum tax, ii) labour income tax rate
- All models share the same monetary policy rule

Permanent fiscal shocks: Long-run multipliers



Note: Simulations of permanent fiscal policy shocks. Shown are long-run multipliers.

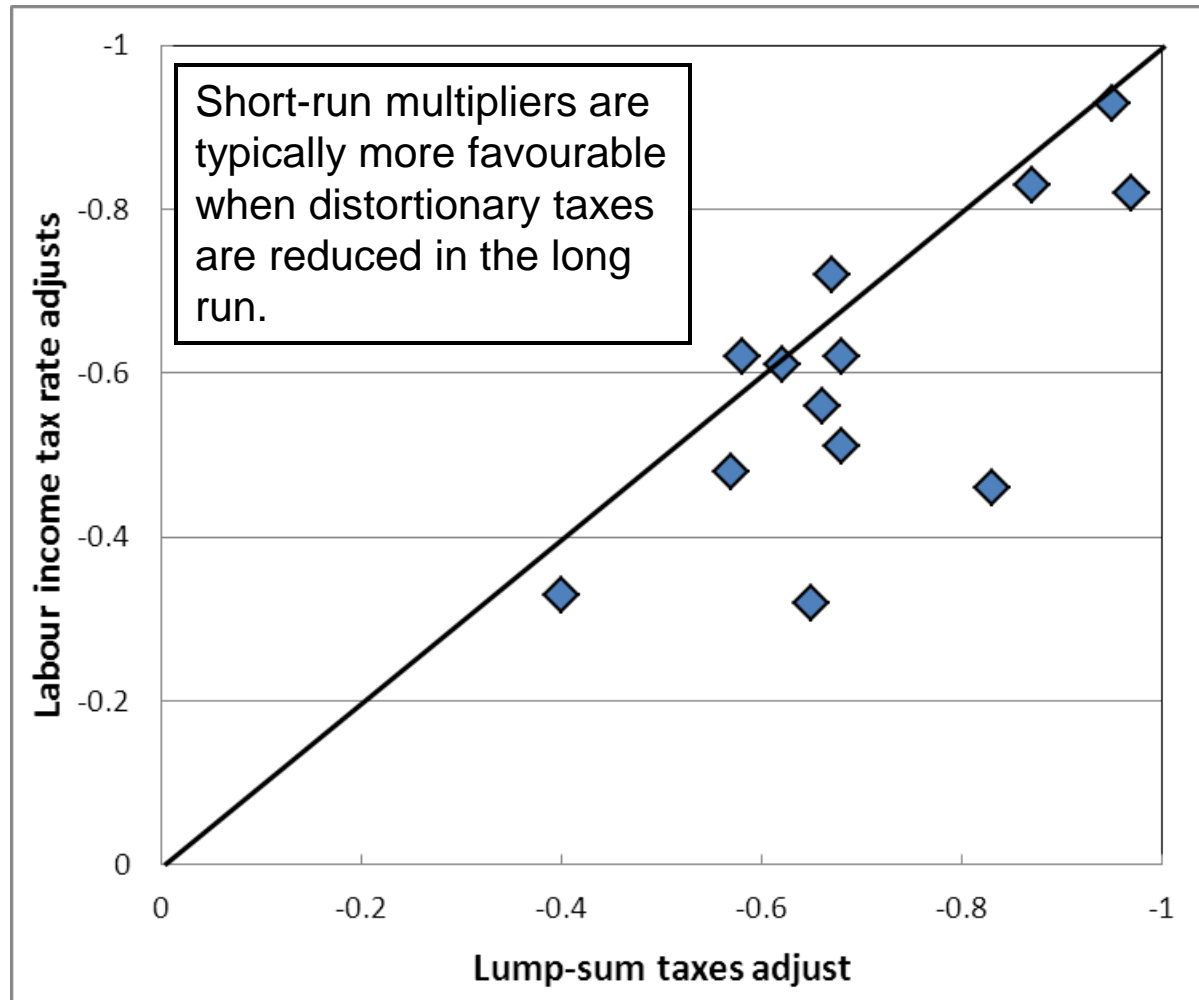
Permanent fiscal shocks: Long-run multipliers



Note: Simulations of permanent fiscal policy shocks. Shown are long-run multipliers.

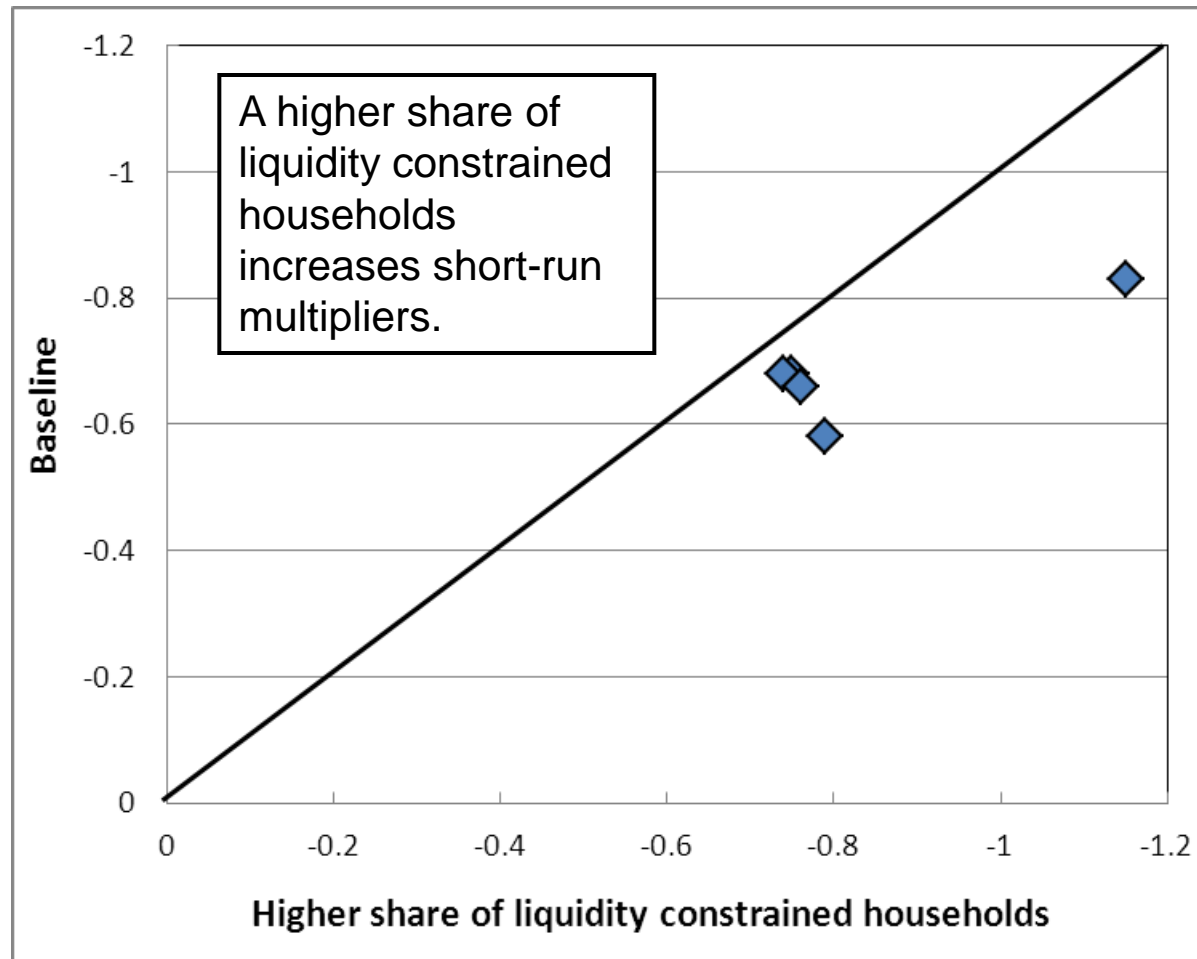
[Tables]

Short-run spending multipliers: The role of the fiscal instrument adjusting in the medium term



Note: Simulations of permanent fiscal policy shocks. Shown are average short-run multipliers for the 1st year.

Short-run spending multipliers: The role of liquidity constraints



Note: Simulations of permanent fiscal policy shocks. Fiscal rule specified in terms of lump-sum taxes. Shown are average spending multipliers for the 1st year for a subset of models (Euro area, Italy, Malta, Portugal, Slovenia)

Summary of main results I

- Country-specific short-run multipliers are in general negative but smaller than one in absolute value.
- Temporary reductions in gov. consumption are typically associated with larger short-run GDP effects than temporary tax hikes.
- Imposing the ZLB to bind for two years does not greatly affect short-run multipliers for euro area countries if fiscal measures are implemented unilaterally.
- When the transitory fiscal shocks are implemented simultaneously in the euro area as a whole, the ZLB amplifies the size of multipliers.

Summary of main results II

- The fiscal item that reacts endogenously to stabilise public debt in the long run influences the short and long-run effects of permanent fiscal shocks.
- Long-run multipliers are in general negative when the budgetary room materialising after the fiscal tightening is used to reduce lump-sum taxes.
- Instead, long-run multipliers are typically positive if the labour income tax rate is reduced in the medium to long term.
- Since households anticipate these long-run GDP effects at the outset of the implementation, short-run multipliers are typically more favourable when distortionary taxes are reduced in the long run.

Background slides

List of participating models

Country	Model	Reference
Belgium	na	
Czech Republic	g3	Benes, Hlédik, Kumhof and Vávra (2005)
Estonia	EP DSGE	Gelain and Kulikov (2009)
Euro area	NAWM	Coenen, McAdam and Straub (2008)
Finland	Aino	Kilponen, Kinnunen and Ripatti (2006)
France	EAGLE	Jacquinot and Lemoine (2013)
Germany	GEAR	Gadatsch, Hauzenberger, Stähler (forthcoming, 2014)
Greece	BoGGEM	Papageorgiou (forthcoming, 2014)
Italy	IDEA-BI-EAGLE	Forni, Gerali, Pisani (2010)
Malta	EAGLE	Micallef (2013)
Netherlands	DELFI	De Nederlandsche Bank (2011)
Portugal	PESSOA	Almeida, Castro, Félix, Júlio and Maria (2013)
Slovenia	EAGLE	Gomes, Jacquinot and Pisani (2010)
Spain	FiMod	Stähler and Thomas (2012)
Sweden	Ramses II	Adolfson, Laséen, Christiano, Trabandt, Walentin (2013)

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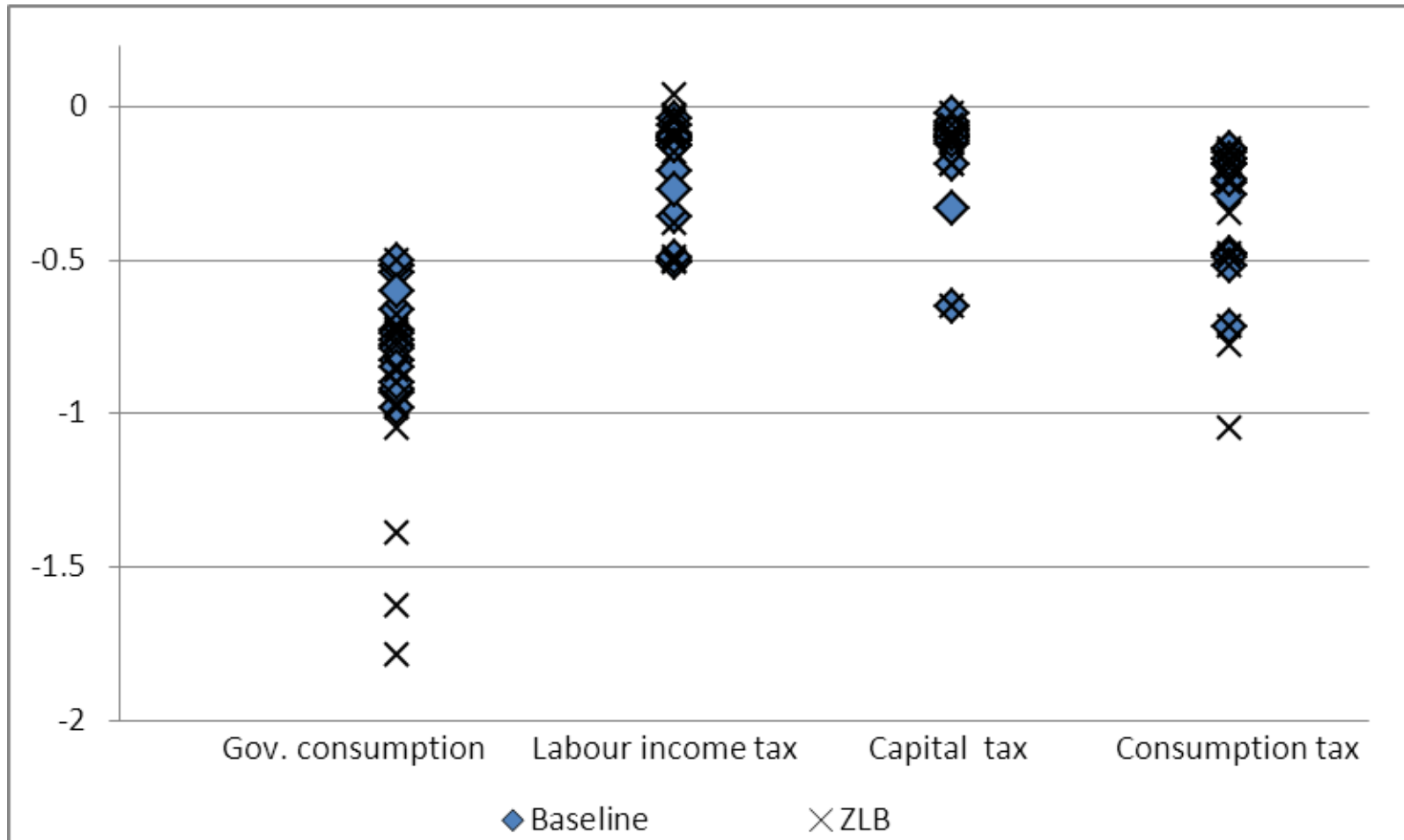
Differences in model parameterisations

There is substantial variation in the parameterisation:

- Imports-to-GDP ratio 0.17 – 0.90
- Labour income tax revenues-to-GDP 0.07-0.35
- Consumption tax revenues-to-GDP 0.04 – 0.43
- Value of the public debt-to-annualized GDP 0.45-1.20
- Share of hand-to-mouth consumers 0-0.40
- Habit persistence in consumption 0-0.90
- Investment adjustment costs 0.20 – 13.7
- Price stickiness (Calvo) 0.50 – 0.90

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Short-run multipliers: The role of the ZLB



Note: Simulations of transitory 2-year fiscal policy shocks. Shown are average multipliers for the 1st year.

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Short-run fiscal multipliers: Temporary reduction in government consumption

	No ZLB		2-year ZLB	
	Year 1	Year 2	Year 1	Year 2
Belgium	-0.93	-0.90	-0.97	-0.95
Czech Republic	-0.54	-0.54	-1.79	-1.57
Estonia	-0.83	-0.66	-0.98	-0.77
Euro area	-0.98	-0.91	-1.39	-1.30
Finland*	-0.78	-0.76	-0.78	-0.76
France	-0.92	-0.71	-1.05	-0.87
Germany	-0.52	-0.48	-0.72	-0.68
Greece*	-0.90	-0.73	-0.90	-0.73
Italy	-0.79	-0.67	-0.86	-0.73
Malta	-0.73	-0.49	-0.73	-0.49
Netherlands*	-0.74	-0.72	-0.74	-0.72
Portugal*	-0.76	-0.23	-0.76	-0.23
Portugal* (ff)	-0.85	-0.37	-0.85	-0.37
Slovenia	-0.66	-0.48	-0.68	-0.50
Spain	-0.50	-0.29	-0.50	-0.29
Sweden	-0.60	-0.63	-1.63	-2.07

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Short-run fiscal multipliers: Temporary increase in labour income tax rate

	No ZLB		2 year ZLB	
	Year 1	Year 2	Year 1	Year 2
Belgium	-0.04	-0.10	-0.03	-0.10
Czech Republic	-0.36	-0.40	-0.38	-0.28
Estonia	-0.21	-0.43	0.04	-0.22
Euro area	-0.11	-0.19	-0.04	-0.12
Finland*	-0.10	-0.13	-0.10	-0.13
France	-0.13	-0.30	-0.09	-0.25
Germany	-0.10	-0.09	-0.15	-0.14
Greece*	-0.50	-0.77	-0.50	-0.77
Italy	-0.06	-0.13	-0.05	-0.12
Malta	-0.09	-0.20	-0.09	-0.20
Netherlands*	-0.11	-0.15	-0.11	-0.15
Portugal*	-0.51	-0.91	-0.51	-0.91
Portugal* (ff)	-0.49	-0.86	-0.49	-0.86
Slovenia	-0.10	-0.19	-0.10	-0.19
Spain	-0.13	-0.11	-0.13	-0.11
Sweden	-0.27	-0.31	0.56	0.88

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Short-run fiscal multipliers: Temporary increase in capital income tax rate

	No ZLB		2 year ZLB	
	Year 1	Year 2	Year 1	Year 2
Belgium	-0.06	-0.08	-0.06	-0.08
Estonia	-0.10	-0.11	-0.10	-0.12
Euro area	-0.12	-0.10	-0.19	-0.17
Finland*	-0.10	-0.12	-0.10	-0.12
France	-0.07	-0.08	-0.09	-0.10
Germany	-0.05	-0.08	-0.11	-0.14
Greece*	-0.65	-1.06	-0.65	-1.06
Italy	-0.08	-0.11	-0.09	-0.12
Malta	-0.02	-0.04	-0.02	-0.04
Portugal*	-0.10	-0.01	-0.10	-0.01
Portugal* (ff)	-0.19	-0.15	-0.19	-0.15
Slovenia	-0.11	-0.11	-0.12	-0.12
Spain	-0.09	-0.07	-0.09	-0.07
Sweden	-0.33	-0.50	-2.18	-3.14

Short-run fiscal multipliers: Temporary increase in consumption tax rate

	No ZLB		2 year ZLB	
	Year 1	Year 2	Year 1	Year 2
Belgium	-0.19	-0.43	-0.20	-0.43
Czech Republic	-0.19	-0.09	-0.15	-0.03
Estonia	-0.25	-0.08	-0.25	-0.08
Euro area	-0.48	-0.62	-0.78	-0.92
Finland*	-0.72	-0.70	-0.72	-0.70
France	-0.14	-0.23	-0.18	-0.29
Germany	-0.17	-0.22	-0.17	-0.17
Greece*	-0.48	-0.56	-0.48	-0.56
Italy	-0.29	-0.36	-0.35	-0.41
Malta	-0.15	-0.18	-0.15	-0.18
Portugal*	-0.49	-0.38	-0.49	-0.38
Portugal* (ff)	-0.52	-0.43	-0.52	-0.43
Slovenia	-0.24	-0.25	-0.24	-0.25
Spain	-0.14	-0.19	-0.14	-0.19
Sweden	-0.17	-0.21	-1.05	-1.45

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Fiscal multipliers: Permanent reduction in government consumption

Fiscal rule:	lump-sum transfers			labour income tax		
	Year 1	Year 2	long run	Year 1	Year 2	long run
Belgium	-0.95	-0.90	-0.63	-0.93	-0.83	0.70
Czech Republic	-0.25	-0.21	-0.43	--	--	--
Euro area	-0.83	-0.62	-0.61	-0.46	-0.29	0.34
Estonia	-0.65	-0.61	-0.68	-0.32	-0.22	0.84
Finland*	-0.40	-0.31	-0.63	-0.33	-0.25	0.91
France	-0.97	-0.76	-0.82	-0.82	-0.48	1.28
Germany	-0.62	-0.40	-0.24	-0.61	-0.51	0.06
Greece*	-0.87	-0.74	-1.05	-0.83	-0.81	0.53
Italy	-0.68	-0.52	-0.58	-0.51	-0.19	0.54
Malta	-0.68	-0.37	-0.51	-0.62	-0.21	0.30
Portugal*	-0.58	-0.35	-0.67	-0.62	-0.05	1.64
Portugal* (ff)	-0.67	-0.44	-0.66	-0.72	-0.20	1.55
Slovenia	-0.66	-0.41	-0.38	-0.56	-0.15	0.82
Spain	-0.57	-0.35	-0.39	-0.48	-0.38	0.31
Sweden	-0.48	-0.44	-0.60	--	--	--

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Fiscal multipliers: Permanent increase in tax rate – lump-sum taxes adjust

Tax rate:	labour income tax			capital income tax			consumption tax		
	Year 1	Year 2	long run	Year 1	Year 2	long run	Year 1	Year 2	long run
Belgium	-0.02	-0.18	-1.03	-0.29	-0.58	-2.11	-0.24	-0.49	-0.57
Czech Republic	-0.20	-0.32	-0.11	--	--	--	-0.03	-0.07	-0.03
Euro area	-0.52	-0.66	-0.87	-1.69	-2.21	-2.56	-0.40	-0.45	-0.51
Estonia	-0.56	-0.65	-0.60	-0.92	-0.76	-1.25	0.00	0.01	-0.16
Finland*	-0.79	-0.64	-1.48	-0.12	-0.99	-1.97	-0.47	-0.10	-0.74
France	-0.28	-0.63	-1.24	-0.36	-0.61	-3.27	-0.18	-0.36	-0.61
Germany	-0.19	-0.15	-0.29	-0.02	-0.11	-0.79	-0.04	-0.06	-0.13
Greece*	-0.57	-0.82	-1.41	-1.18	-2.46	-3.77	-0.39	-0.58	-0.96
Italy	-0.19	-0.38	-0.91	-0.21	-0.57	-2.50	-0.08	-0.15	-0.36
Malta	-0.14	-0.33	-0.72	-0.06	-0.16	-1.67	-0.09	-0.17	-0.31
Portugal*	-0.47	-1.04	-1.27	-0.34	-0.45	-2.01	-0.29	-0.52	-0.66
Portugal* (ff)	-0.45	-0.98	-1.27	-0.54	-0.53	-2.00	-0.28	-0.50	-0.66
Slovenia	-0.26	-0.55	-1.42	-0.48	-0.77	-3.26	-0.13	-0.23	-0.54
Spain	-0.12	-0.11	-0.53	-0.26	-0.45	-3.25	-0.16	-0.18	0.00
Sweden	-0.35	-0.50	-0.68	-0.43	-0.80	-1.81	-0.15	-0.21	-0.28

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Fiscal multipliers: Permanent increase in tax rate – labour income taxes adjust

Tax rate:	capital Income tax			consumption tax		
	Year 1	Year 2	long run	Year 1	Year 2	long run
Belgium	-0.29	-0.44	-1.04	-0.18	-0.35	0.53
Czech Republic	--	--	--	--	--	--
Euro area	-1.23	-1.82	-1.17	-0.09	-0.17	0.33
Estonia	-0.48	-0.64	-0.16	0.27	0.38	1.73
Finland*	0.13	-0.91	-1.52	-0.37	-0.28	1.07
France	-0.22	-0.41	-2.43	-0.05	-0.11	1.31
Germany	-0.14	-0.15	-0.98	-0.17	-0.20	1.41
Greece*	-1.17	-2.51	-2.69	-0.35	-0.56	0.55
Italy	-0.08	-0.30	-1.92	0.10	0.20	0.66
Malta	-0.02	-0.08	-1.26	-0.02	0.01	0.47
Portugal*	-0.34	-0.17	-0.79	-0.30	-0.36	0.58
Portugal* (ff)	-0.57	-0.30	-0.82	-0.31	-0.37	0.53
Slovenia	-0.39	-0.52	-2.36	-0.02	0.07	0.59
Spain	-0.29	-0.48	-2.79	-0.18	-0.21	0.74