

Fiscal spillovers in the Euro area

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1 Introduction

- The financial crisis has put fiscal policy back in the spotlight of academic research (e.g. Hall, 2009, Woodford, 2009, Canova and Pappa, 2011; Auerbach and Gorodnichenko, 2012).
- Important academic discussion about the effects anticipated vs. unanticipated fiscal shocks (e.g. Ramey, 2011, Leeper et al., 2012).
- Renewed institutional debate on the size of the fiscal multiplier (e.g. IMF, 2012; Mertens and Ravn 2012; Blanchard and Leigh, 2013).
- Policy debate regarding the Euro area effects of fiscal contractions in Mediterranean countries.

- Theory: effects of fiscal contractions may depend on the state of the economy, level of debt, monetary policy stance, confidence of private agents, exchange rate regime, etc.
- Empirics: still unclear what are the macroeconomic consequences of fiscal policy actions, the channels of domestic and international transmission, and the effects of a coordinated fiscal retrenchment in a situation of high debt, financial weakness and low confidence.

- Measure the spillovers of fiscal shocks in the Euro area.
 - Construct a (historical) measure of the fiscal stance.
 - Explore the domestic effects of unexpected expenditure cuts and their international transmission.
 - Measure (domestic and international) output multipliers.
 - Investigate the effects of coordinated vs. idiosyncratic changes.
 - Study the effects of expenditure reducing vs. deficit reducing policies.
 - Compare pre and post crisis transmission.

Related literature

- Auerbach and Gorodnichenko (2013), Faccini et al. (2012), Corsetti and Mueller (2012): Open economy multipliers.
- Beetsma and Giuliodori (2011): Multipliers and REE effects in the EU.
- Benassy-Quere and Cimodamo (2006); Beetsma et al. (2006), (2008) Trade effects.
- Alesina et al. (2012); Batini et al. (2012); Hall (2012): Consequences of fiscal consolidations.
- Corsetti et al. (2012), Iltzeski et al. (2012), Christiano et al. (2011), Caldara and Kemps (2012), Erceg and Linde (2012), Leeper et al. (2011), Woodford (2009): What determines the size of the multipliers?

Yesterday...

- Atif Mian: Not enough risk sharing in Europe
- Rudolfs Bems: Important expenditure switches driven by falls in income not in relative price changes.
- Jordi Gali: Internal devaluation may not be successful.
- Emmaneul Farhi: Demand externalities.

Same themes come up in this paper.

Findings

- 1) Contractionary expenditure shocks in the periphery have heterogeneous domestic effects. Trade balance (import) dynamics key to understand cross-country differences.
- 2) The effects on debt and long term yields are small or perverse: the signalling effects of contractionary measures in financial markets limited.
- 3) International transmission important also before 2008. Trade channel crucial.
- 4) Deficit cuts have larger effects than expenditure cuts, both domestic and internationally.

5) Magnitude of the spillovers in periphery changes after 2008; responses become more homogeneous.

6) Virtuous domestic effects disappear in periphery after 2008; the core seems to benefit more - redistribution shock.

2 The empirical model

Panel VAR model (e.g. Canova and Ciccarelli, 2009):

$$\begin{aligned}y_{it} &= D_i(L)Y_{t-1} + F_i(L)W_{it} + e_{it} \\ e_{it} &\sim N(0, \Sigma_i)\end{aligned}\tag{1}$$

$y_{it} : G \times 1; Y_t = (y'_{1t}, \dots, y'_{Nt})'; i = 1, \dots, N$ (countries); $t = 1, \dots, T$ (time)

- Variables are demeaned, standardized, year-on-year growth rates.
- Allows for dynamic and static interdependencies.
- Allows for cross sectional heterogeneity in dynamic relationships and the variance of the error vector.

Model (in regression format):

$$Y_t = Z_t\delta + E_t \quad E_t \sim N(0, \Omega) \quad (2)$$

- Curse of dimensionality: Factor structure for coefficients (shrinkage prior):

$$\delta = \Xi_1\theta_1 + \Xi_2\theta_2 + \Xi_3\theta_3 + \Xi_4\theta_4 + u \quad u \sim N(0, \Omega \otimes \sigma^2 I) \quad (3)$$

- θ_1 : movements in the coefficient vector which are country-specific; θ_2 : movements which are variable-specific; etc.

Kroneker structure for the variance: $\Omega = P \otimes V$, where P is $N \times N$ matrix, V is $G \times G$ matrix.

Fiscal stance indicators

An indicator of the fiscal stance in country i is

$$NFI_{jit} = Z_{t\Xi_{1i}}\theta_{1i} + Z_{t\Xi_{2i}}\theta_{2j}$$

An indicator of the aggregate fiscal stance is

$$RFI_{jt} = \sum_{i=1}^N Z_{t\Xi_{1i}}\theta_{1i} + Z_{t\Xi_{2i}}\theta_{2j}$$

- $Z_{t\Xi_{2i}}\theta_{2j}$ could be either the deficit or the debt variable. Effects of exogenous variables netted out
- Gives historical record: the stance loose if indicator is positive; it is tight if indicator is negative.

Inference

Structural changes: Rolling window estimation with 18 years of data.

Identification: Blanchard-Perotti style restrictions i.e. domestically, government expenditure is assumed to be predetermined relative to other domestic variables except for local output.

- To be changed in future versions: plan to use both sign and (relative) magnitude restrictions.

Output Multipliers: computed as in Auerbach and Gorodnichenko (2012).

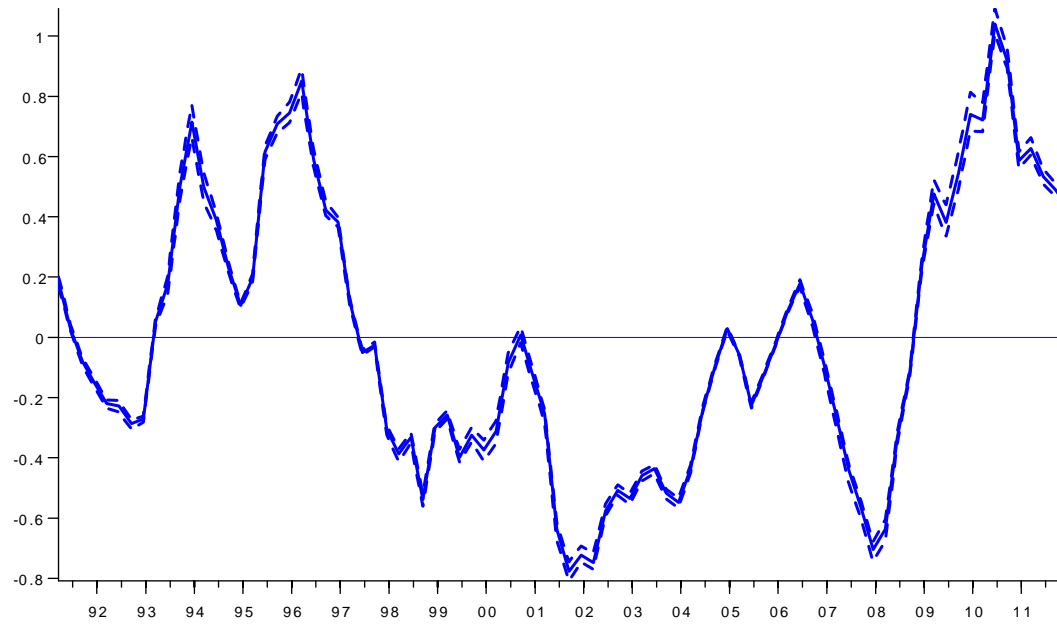
3 The data

- Seven countries (87 percent of the area GDP): Greece, Italy, Spain and Portugal (Periphery); France, Germany and the Netherlands (Core)
- Eight endogenous variables: real government consumption expenditure (G), total government revenues (T), total gross government debt (D), real gross domestic product (Y), real total private consumption (C), real total fixed investment (I), capital account (CA), and 10-years bond yields (LR).
- Six exogenous variables (short term rate, GDP and CPI in US and EA) plus G forecasts by OECD - to control for predictable components, see Ramey (2011).
- Sample: 1990:1 to 2011:4.

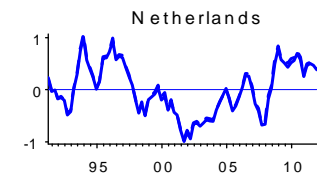
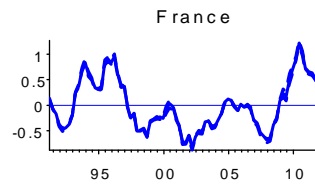
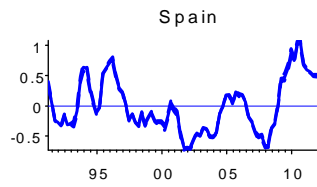
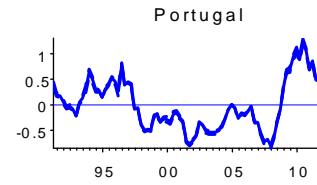
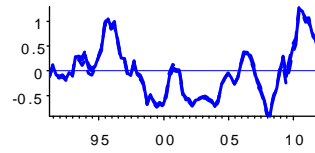
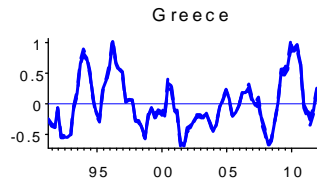
4 The Results

- **Fiscal Indicators**
- Domestic Transmission pre crisis
- Multipliers pre crisis
- International Transmission pre crisis
- Post crisis transmission/multipliers
- Government vs deficit cuts

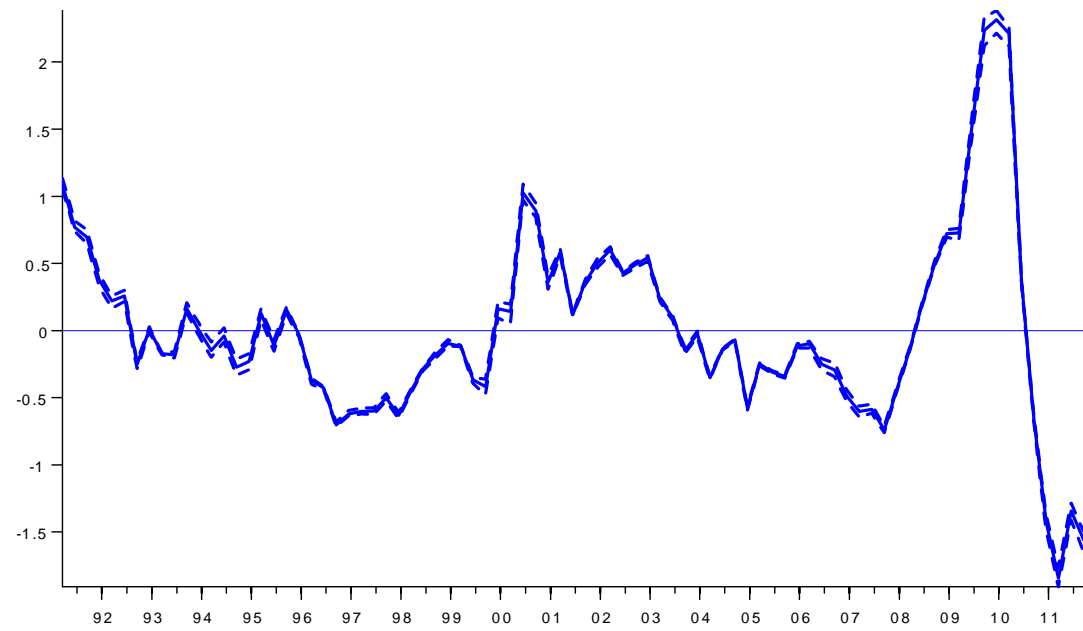
Aggregate debt-based fiscal stance



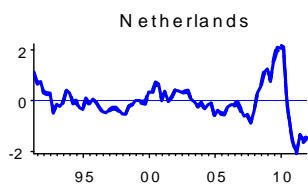
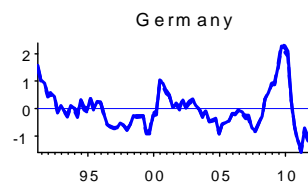
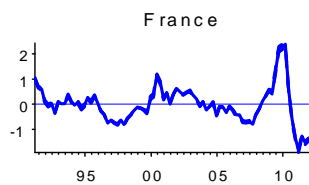
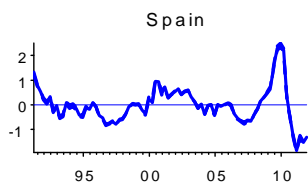
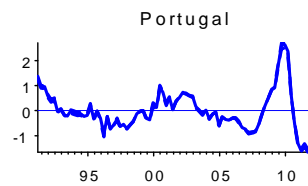
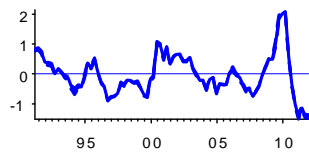
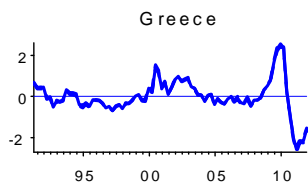
Country specific debt-based fiscal stance



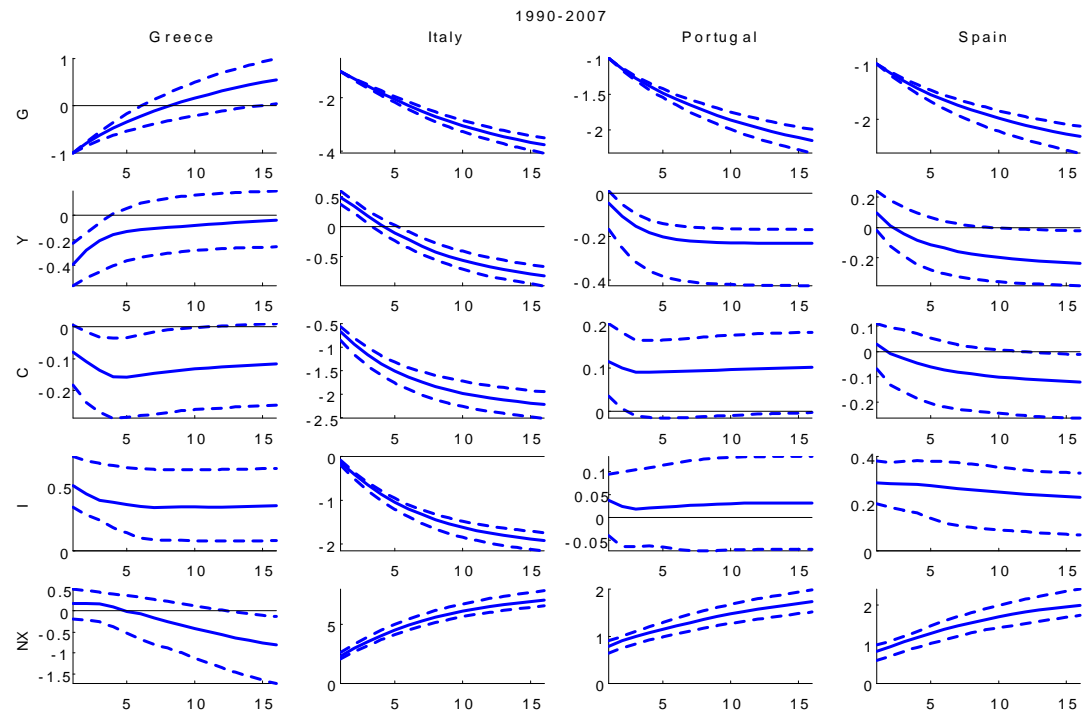
Aggregate deficit-based fiscal stance

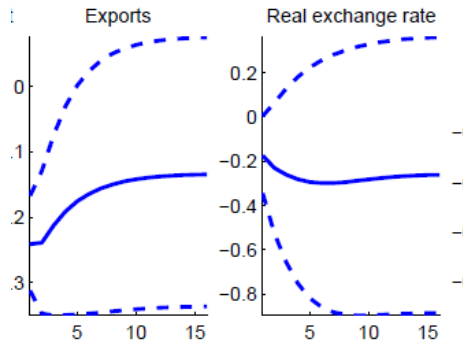


Country specific deficit-based fiscal stance

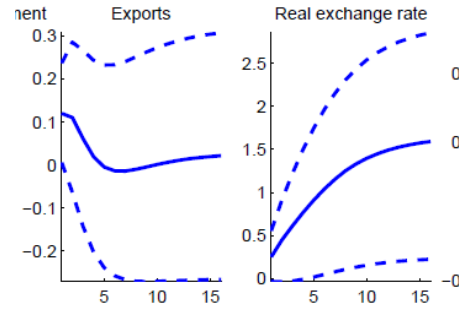


- Fiscal Indicators
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- International Transmission pre crisis
- Post crisis transmission/multipliers
- Government vs deficit cuts

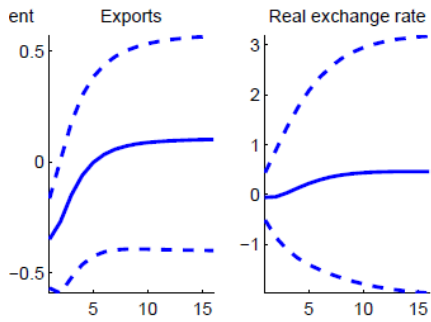




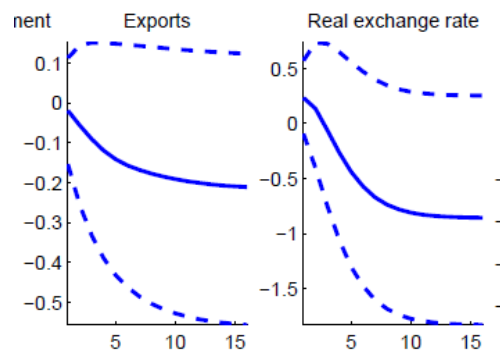
Greece



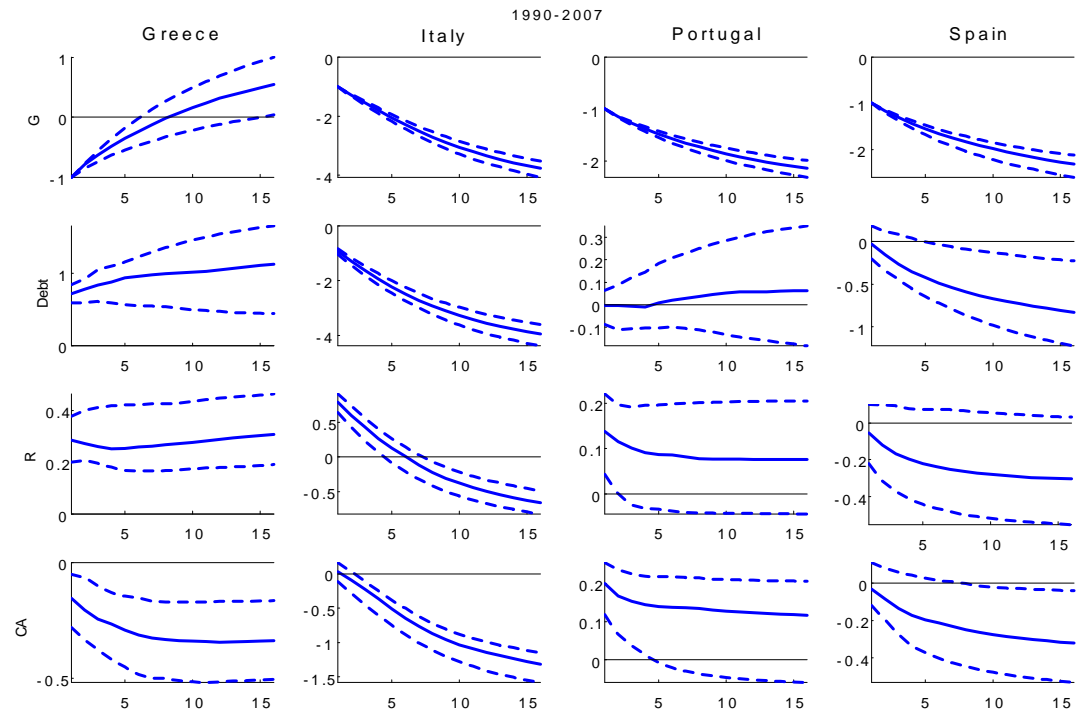
Spain



Italy



Portugal



- Large cross country heterogeneities
- Dynamics of the trade balance crucial to understand domestic effects
- Effect on long term interest rates initially perverse.

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How big are multipliers?

- Spilimbergo et al. (2009): Average (domestic) multipliers 0.5, most values above zero but below the mean.
- Gechert and Will (2012), Andres and Domenech (2012): Average (domestic) multipliers (0.5, 1.0), depending on instrument and estimation method.
- Size depends: (i) financial frictions; (ii) instrument and level of debt; (iii) nominal and real rigidities; (iv) monetary policy stance; (v) exchange rate regime; (vi) degree of openness; (vii) individual vs. coordinated actions; (viii) credibility of measure (Iltezky, et al (2012), Corsetti et al (2012), etc.).

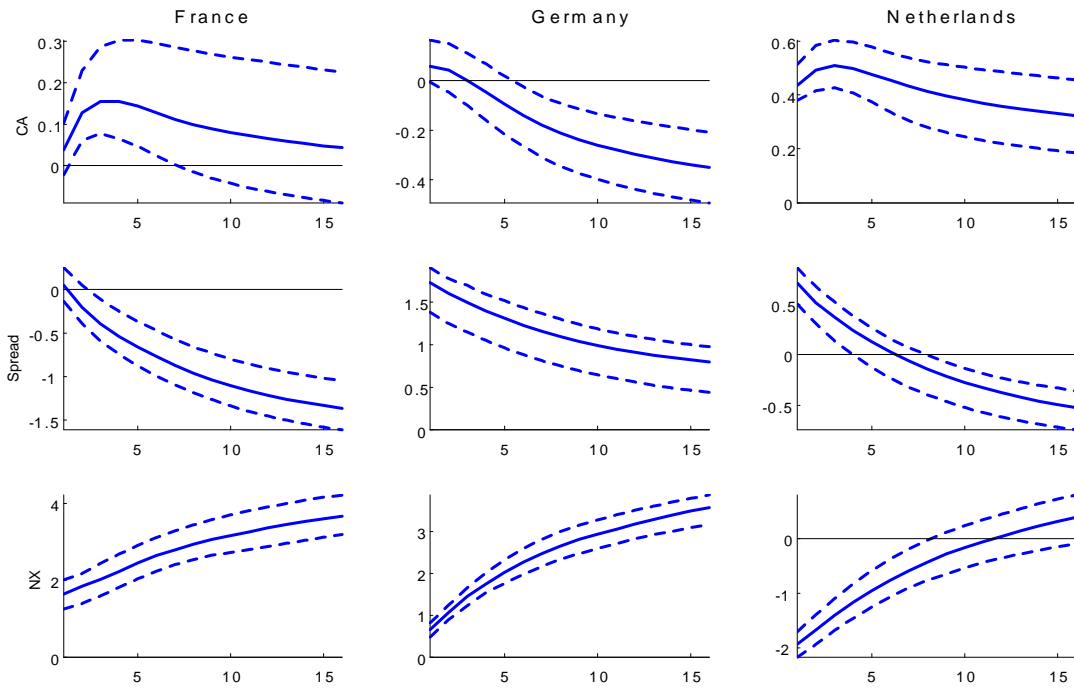
Short term multipliers (2 quarters)					
	Greece	Italy	Portugal	Spain	Common
Greece	0.35*	-0.03*	0.04*	0.03*	0.26*
Italy	0.75*	-0.27*	0.04*	0.03*	0.27*
Portugal	0.36*	-0.32*	0.09*	0.03*	0.05
Spain	-0.68*	0.24*	0.28*	-0.01	0.05
France	-2.57*†	-0.31*	0.32*	0.40*	-1.18*
Germany	-0.44*	-0.35*	0.18*	0.12	-0.34*
Netherlands	1.17*	0.77*	-0.31*	-0.06	1.17*
Medium term multipliers (12 quarters)					
Greece	0.06	0.04*	0.09*	0.08*	0.16*
Italy	-0.41	0.20*	0.12*	0.13*	0.46*
Portugal	-0.30	-0.13*	0.11*	0.05*	0.04
Spain	1.35	0.23*	0.25*	0.09*	0.24*
France	4.33	-0.12*	0.24*	0.28*	-0.46*
Germany	0.95	-0.05*	0.17*	0.15*	-0.04
Netherlands	-1.25	0.33*	-0.09*	0.01	0.54*

*=posterior credible set above 0, †=posterior credible set above 1. Sample 1990-2007

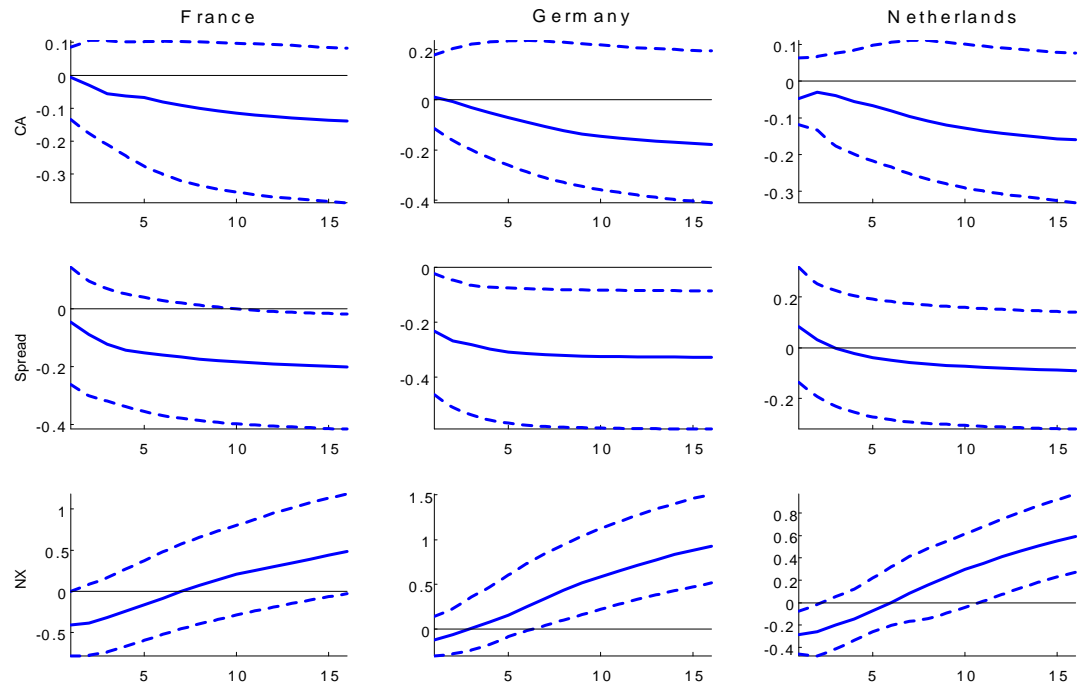
- Domestic multipliers typically less than 0.5.
- Positive short run effects in periphery from Italy consolidation.
- Spillovers to core more important than spillover to periphery.
- Medium term multipliers smaller - effect dies out.
- Multipliers for common and individual shocks similar - externalities due to second round effects small.

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Expenditure Impulse in Italy 1990-2007

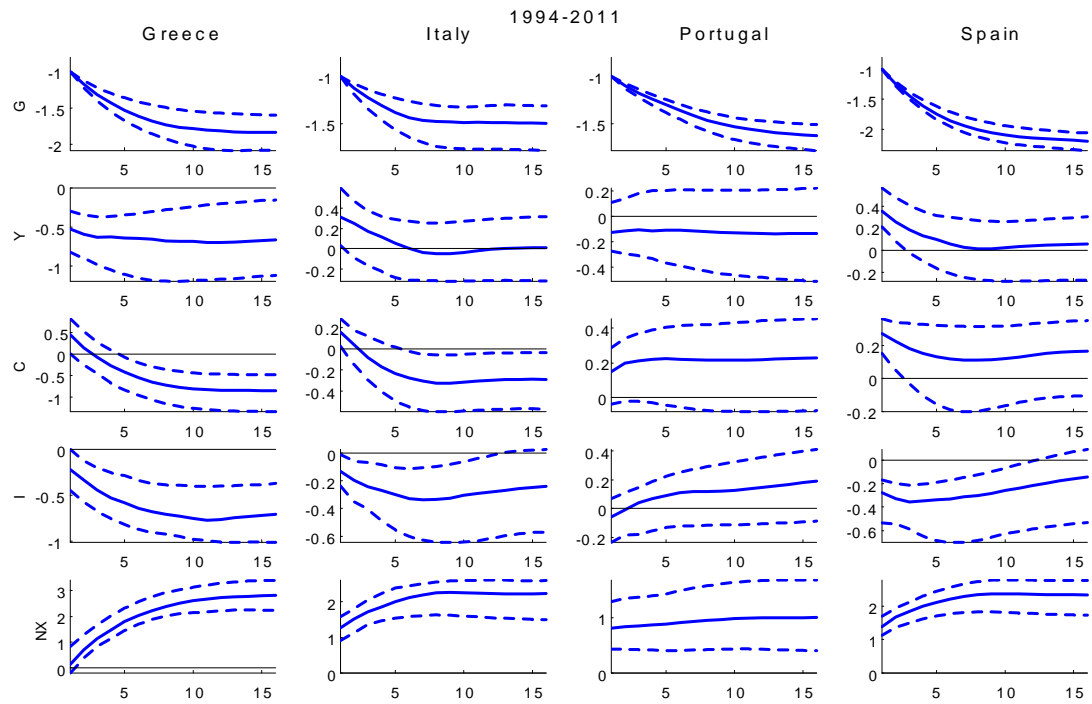


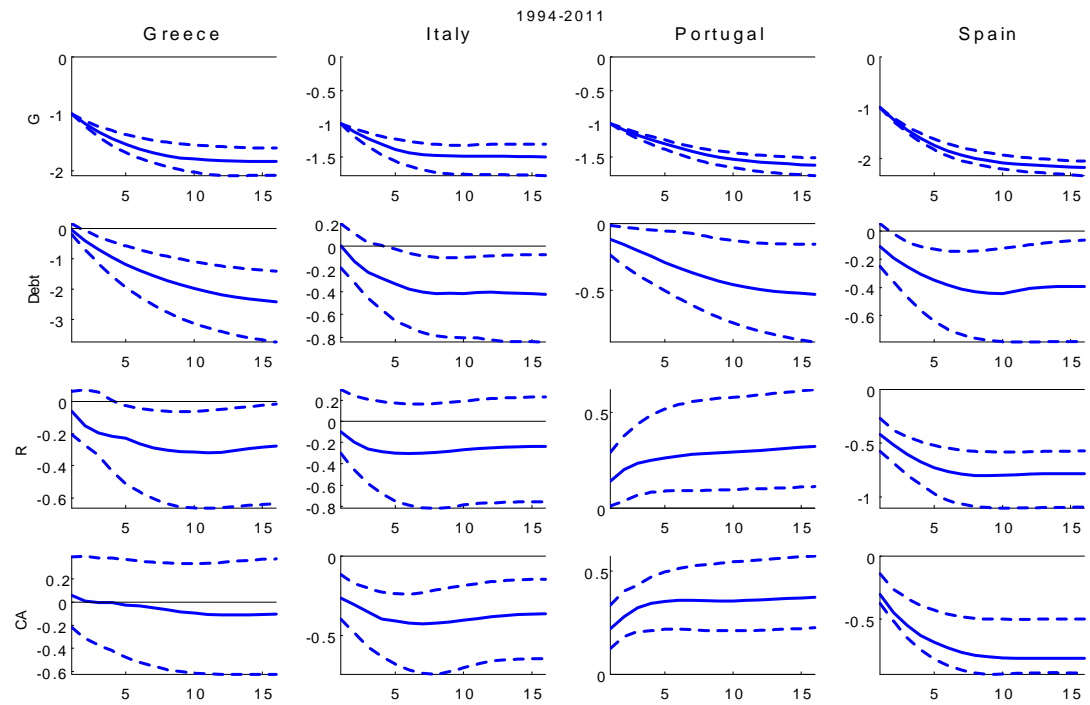
Expenditure impulse in Spain 1990-2007



- Evidence of contagion (even before 2008)
- Net export in the core generally improves.
- Current account balance mixed.

- Fiscal Indicators
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- Expenditure responses permanent everywhere.
- Virtuous output effect for outlay disappear, but appears after Spain contraction.
- Response of output still driven by NX; I generally down, C unchanged.
- Debt response sticky, declines in medium run.
- Long rate and current account dynamics mixed.

Short term multipliers (2 quarters)					
	Greece	Italy	Portugal	Spain	Common
Greece	0.50*	0.02	-0.01	0.01	0.50*
Italy	-0.00	-0.23	-0.01	0.01	-0.20
Portugal	0.56*	0.59*	0.11	0.01	1.14*
Spain	-0.99*	0.00	-0.22*	-0.21*	-1.40*
France	-0.59*	0.04	0.61*	0.25*	0.55
Germany	-0.37*	-0.36*	0.06*	-0.04	-0.64*
Netherlands	-0.67*	0.27	-0.67*	0.07	-0.88*
Medium term multipliers (12 quarters)					
Greece	0.38*	0.05	-0.01	0.03	0.42*
Italy	-0.36*	0.00	0.01	0.02	-0.33
Portugal	0.11	0.44*	0.08	0.01	0.44*
Spain	-0.79*	0.16	-0.22	-0.02	-0.74*
France	-0.55	0.05	0.48*	0.16	0.10
Germany	-0.43*	-0.24	0.06	-0.04	-0.61*
Netherlands	-0.72*	0.22	-0.41*	0.02	-0.76*

*=posterior credible set above 0, †=posterior credible set above 1. Sample 1994-2011

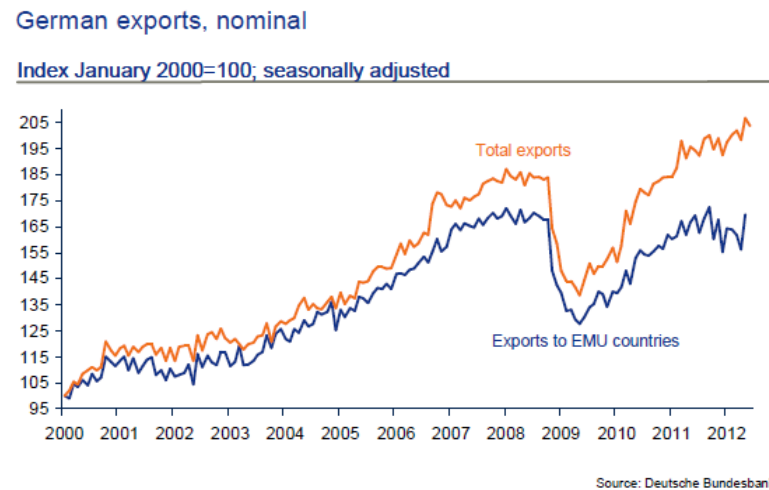
- Multipliers in the periphery generally smaller in this sample.
- Common shock multiplier much larger than individual shocks - externalities larger.
- Effect on the core countries now larger and mostly negative, especially on Germany - redistributive shock.

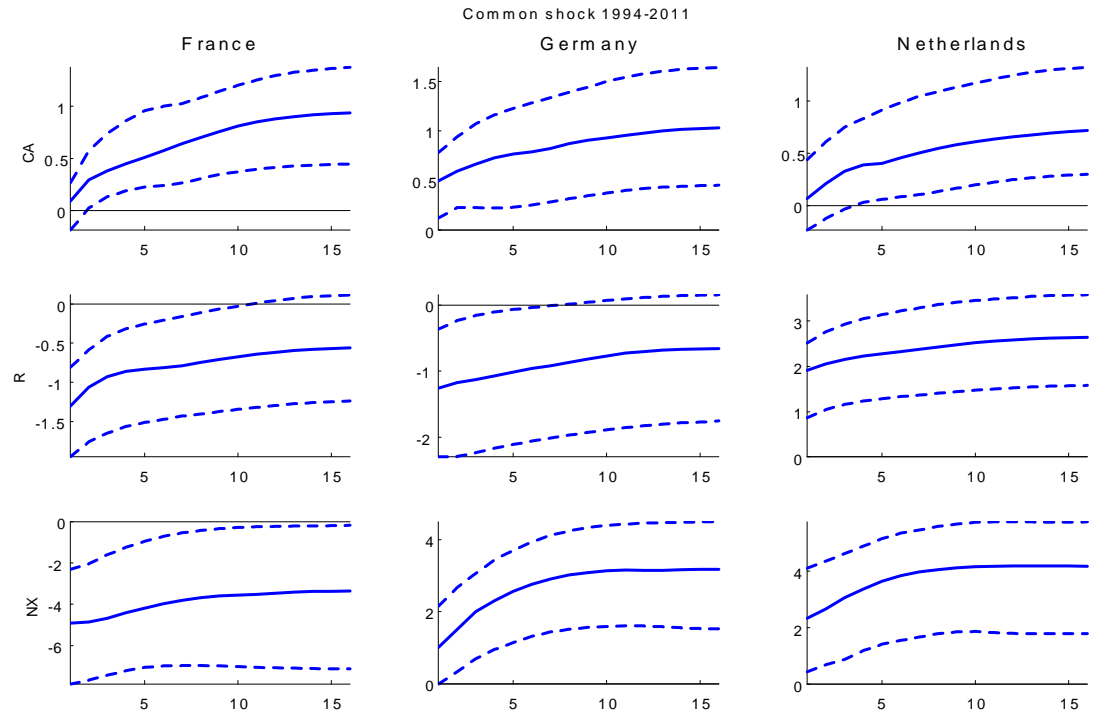
Why is the core benefitting? Euro depreciates. Germany better off more because of higher productivity and export oriented economy.

- Indirect evidence: Broyer, Petersen, Schneider, 2013: The impact of the euro crisis on the German economy, Allianz, wp 154.

i) The Euro has depreciated 15 percent since 2009

ii) Germany merchandise export: widening gap





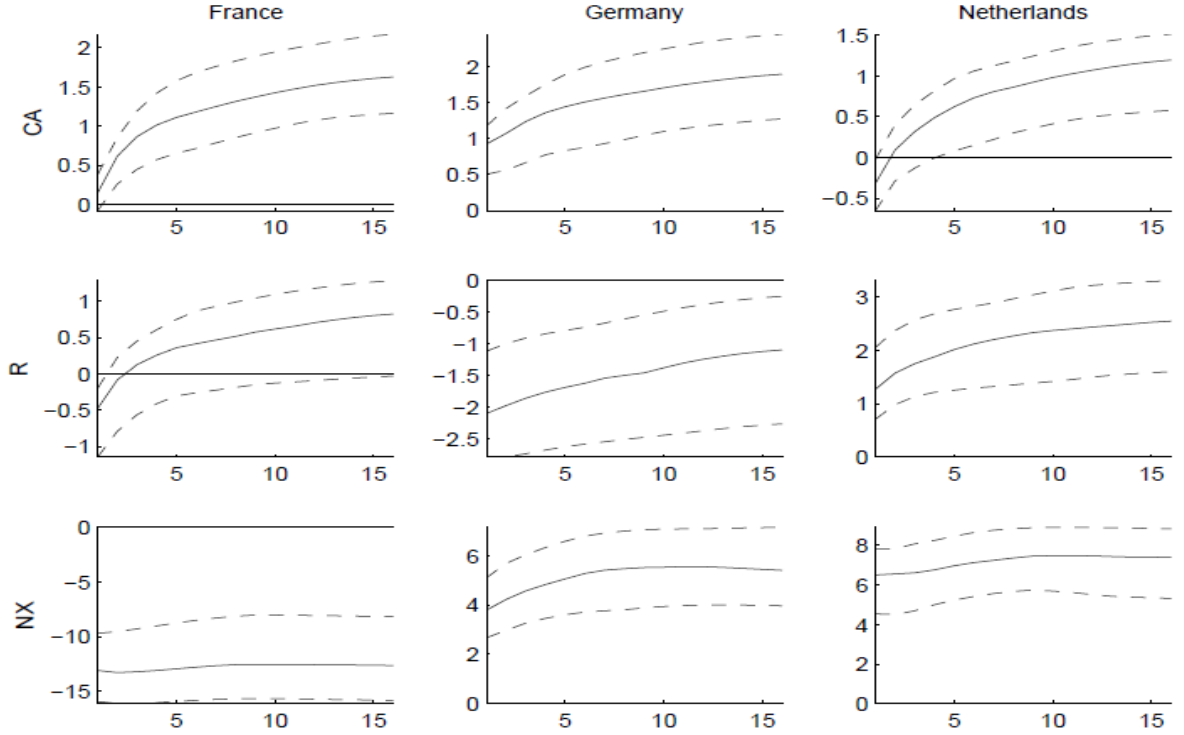
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Short term multipliers, Deficit consolidation					
	Greece	Italy	Portugal	Spain	Common
Greece	1.32*	0.08*	-0.04*	-0.03	1.26*
Italy	0.45*	-0.73*	-0.04*	-0.03	-0.38*
Portugal	0.31*	0.76*	0.05	-0.03	1.07*
Spain	-2.03*†	0.65*	-0.35*	-0.29*	-1.87*†
France	2.04*†	0.74*	0.56*	0.31*	3.67*†
Germany	-1.08*	0.11	-0.49*	-0.30*	-1.58*†
Netherlands	-2.82*†	-0.31	-0.52*	0.08	-3.47*†
Medium term multipliers, Deficit consolidation					
Greece	0.86*	0.36*	-0.21*	-0.02	0.90*
Italy	0.01	-0.06	-0.19*	-0.04	-0.26*
Portugal	-0.13	0.67*	-0.07	-0.09	0.32
Spain	-1.39*†	0.72*	-0.41*	-0.07	-1.07*
France	0.87*	0.69*	0.30	0.11	1.78*†
Germany	-0.82*	0.28*	-0.54*	-0.24	-1.02*
Netherlands	-1.93*†	0.01	-0.50*	-0.05	-2.18*†

*=posterior credible set above 0, †=posterior credible set above 1. Sample 1994-2011.

- Much larger multiplier than when expenditure is cut.
- Italy output up to Italian and common deficit cut shock.
- Spain output up to Greece, Italy, Spain and common shock.

Impulse responses: Common 1994–2011



5 Still to investigate

- Large consolidation shocks (as in Canova and Pappa, 2011).
- Labor market effects.
- Why does the trade balance of core improves after a contractionary fiscal shock in the periphery? Euro rate dynamics.
- Conditional forecasts: Consequence of debt decline by 5 percent permanently: immediate or gradual.
- Non-Euro area repercussions: UK?, Nordic countries?