

# Fiscal Shocks and The Real Exchange Rate

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# Fiscal Policy in Open Economies

- Under-studied relative to monetary policy, especially non-US evidence
- EMU: FP only national-level macroeconomic policy
- Effective?
- Well timed?
- Medium-term versus cyclical impact
- Composition of government spending

- Equilibrium RER and Mix of Government Spending (Galstyan-Lane, *JMCB*, Sept.2009)
- *Fiscal Shocks and the RER*
- Complementary study: Fiscal shocks and sectoral composition of output
- Fiscal cyclicalilty
- The Crisis and FP
- “Leaning Against the Wind” and FP

# Fiscal Shocks and the Real Exchange Rate

- Question: How do increases in government spending affect the real exchange rate?
- Mundell-Fleming-Obstfeld-Rogoff: real appreciation
- Many RBC-type models: real depreciation (labour supply channel)
- VAR evidence of Perotti and others: real depreciation a 'stylised fact'

# Fiscal Shocks and the Real Exchange Rate: SVAR Analysis

- Monacelli and Perotti (2006): Q data (US, UK, Canada, Australia), real depreciation (GC)
- Beetsma et al (2007): EU14 sample, real appreciation (GC and GEXP)
- Here: Focus on Euro11 Sample but also look at Perotti sample; (GEXP, GINV, GC, WGC, NWGC)
- We find real appreciation for Euro sample but real depreciation for Perotti sample
- Also: differences across types of government spending

- $GC$  vs  $GINV$  (LR; SR)
- $WGC$  vs  $NWGC$

# Main Focus: 3-variable system

- G; GDP; RER
- Focus is on RER response but 'output multipliers' also interesting
- Ordering: fiscal spending exogenous vis-a-vis 'within the year' shocks to output and RER; output exogenous vis-a-vis 'within the year' shocks to RER
- Also look at relative price of nontradables
- (Also impact on sectoral composition of output)

## Method: panel vector autoregression

We estimate a three-variable panel-VAR for eleven EMU countries using annual data for the period 1970-2006.

- ◇ government spending (**g**)

$$\text{GEXP} = \text{GINV} + \underbrace{\text{WGC} + \text{NWGC}}_{\text{GC}}$$

GEXP: absorption

GINV: investment

GC: consumption (transfers excluded)

WGC: wage consumption

NWGC: non-wage consumption

- ◇ real GDP (**y**)

- ◇ real exchange rate (**e**)

# Annual Data versus Quarterly Data

- Broader set of countries
- Annual cycle in fiscal policy
- Diminishes impact of 'anticipation' effect

Using quarterly fiscal data for Australia, Canada, United Kingdom and United States:

- ◇ Monacelli and Perotti (2006)
- ◇ Ravn, Schmitt-Grohé and Uribe (2007)

Using annual data and EU countries:

- ◇ Beetsma, Giuliadori and Klaassen (2008)

$$A_0 Z_{i,t} = A(L) Z_{i,t-1} + C X_{i,t} + \varepsilon_{i,t} \quad (1)$$

$$Z_{i,t} = \begin{bmatrix} g_{i,t} \\ y_{i,t} \\ e_{i,t} \end{bmatrix} \quad A_0 = \begin{pmatrix} 1 & -\alpha_{yg} & -\alpha_{eg} \\ -\alpha_{gy} & 1 & -\alpha_{ey} \\ -\alpha_{ge} & -\alpha_{ye} & 1 \end{pmatrix}$$
$$X_{i,t} = \begin{bmatrix} c_j \\ t_{i,t} \\ d_t \end{bmatrix} \quad \varepsilon_{i,t} = \begin{bmatrix} \varepsilon_{i,t}^g \\ \varepsilon_{i,t}^y \\ \varepsilon_{i,t}^e \end{bmatrix}$$

$$Z_{i,t} = B(L)Z_{i,t-1} + DX_{i,t} + u_{i,t} \quad (2)$$

where  $B(L) = A_0^{-1}A(L)$   $D = A_0^{-1}C$   $u_{i,t} = A_0^{-1}\varepsilon_{i,t}$

$$u_{i,t} = \begin{bmatrix} u_{i,t}^g & u_{i,t}^y & u_{i,t}^e \end{bmatrix}'$$

To recover  $\varepsilon_{i,t}$ , we impose  $\alpha_{yg} = \alpha_{eg} = \alpha_{ey} = 0$  to matrix  $A_0$ .

# RER model: Shock to GEXP

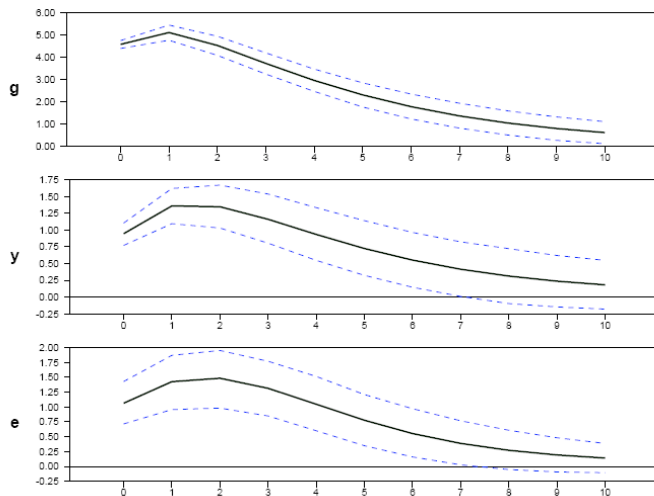


Figure: Shock to GEXP

# RER model: Shock to GINV

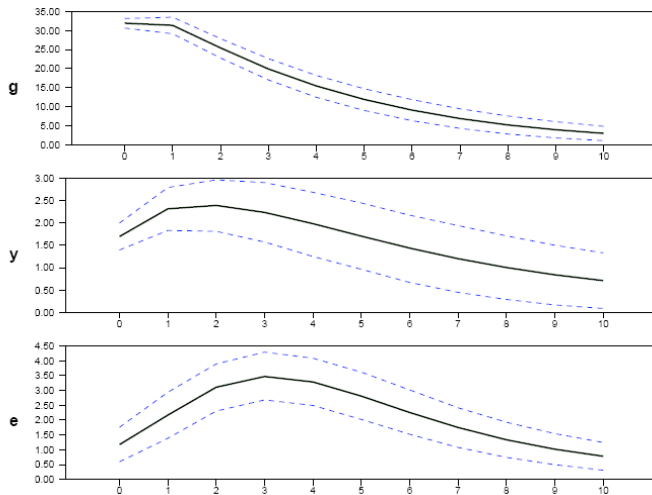


Figure: Shock to GINV

# RER model: Shock to GC

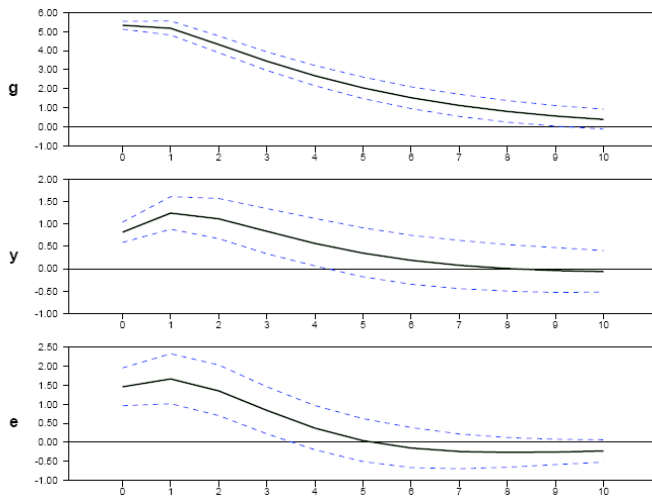


Figure: Shock to GC

# RER model: Shock to WGC

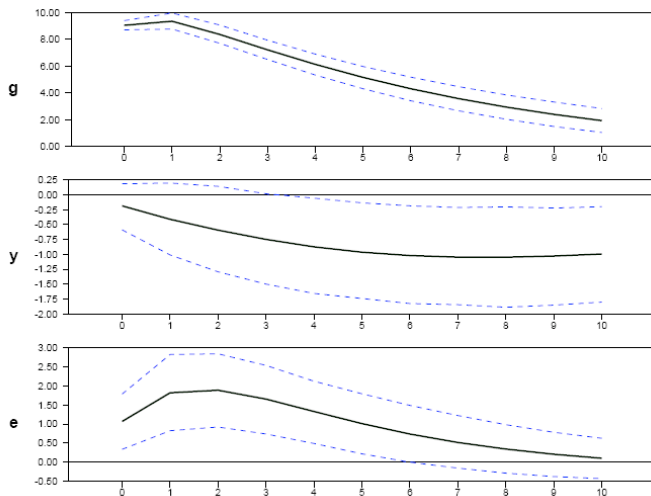
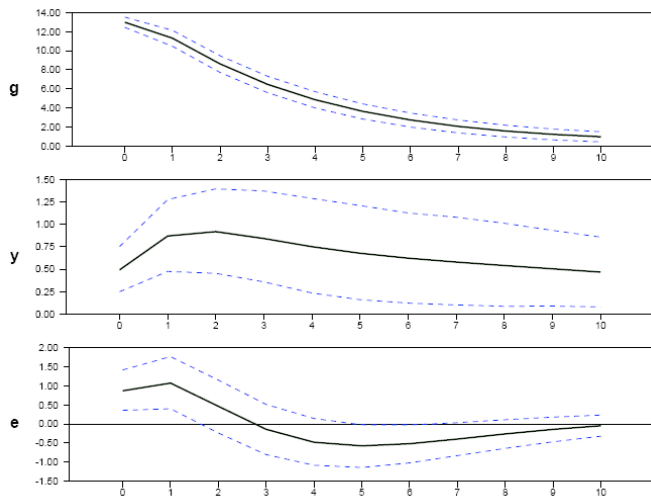


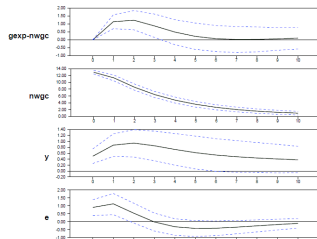
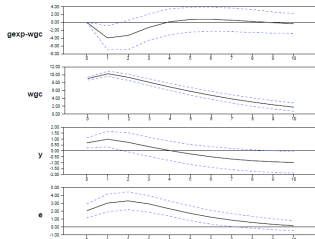
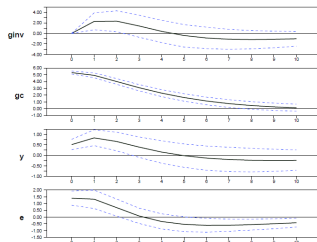
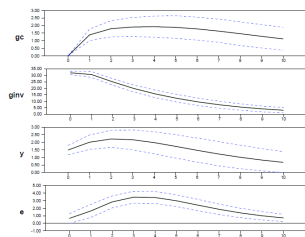
Figure: Shock to WGC

# RER model: Shock to NWGC



- ◇ increase the dimension of the VAR including a new spending variable: **GEXP-g**
- ◇ alternative sample periods
- ◇ include debt/GDP ratio as a restriction on path for GEXP

# Four-variable VAR: GINV, GC, WGC, NWGC



# Relative price of nontradables

$$\frac{Z_{i,t}}{Z_{i,t-1}} = \frac{\frac{P_{i,t}^{NT}}{P_{i,t-1}^{NT}}}{\frac{P_{i,t}^T}{P_{i,t-1}^T}} - \prod_{j \neq i} \left( \frac{\frac{P_{j,t}^{NT}}{P_{j,t-1}^{NT}}}{\frac{P_{j,t}^T}{P_{j,t-1}^T}} \right)^{\omega_{ij}} \quad (3)$$

# Relative price of Nontradables: Shock to GEXP

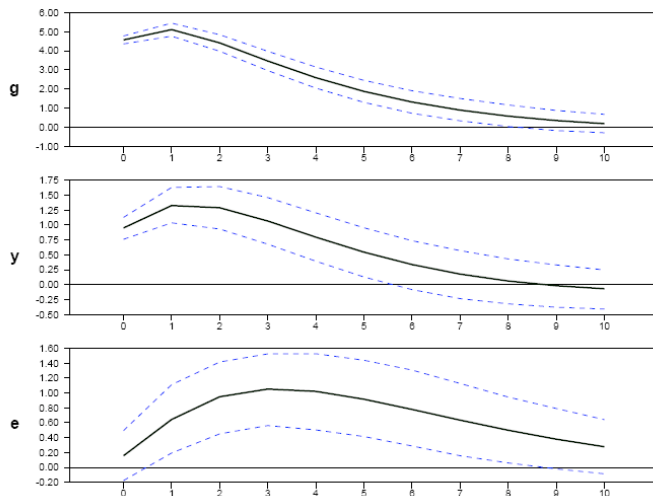
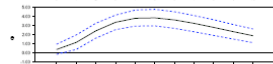
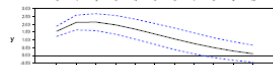
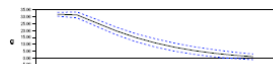
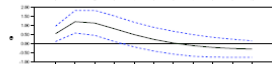
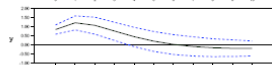
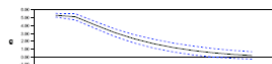


Figure: Shock to GEXP

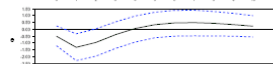
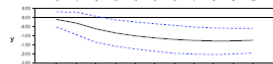
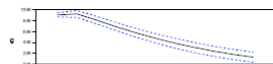
# Relative price of nontradables: Subcomponents



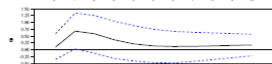
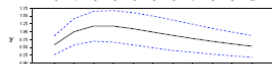
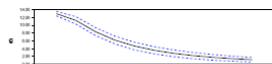
shock to GINV



shock to GC



shock to WGC

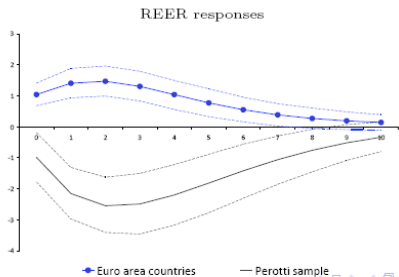
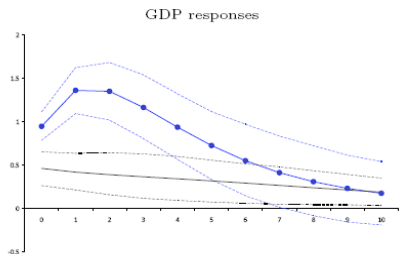


shock to NWGC

# Comparison with the existing literature

- ◇ Studies using Australia, Canada, United Kingdom and United States (The 'Perotti' sample) find real exchange rate depreciation (↓)
  - ◇ data: quarterly (absolute)
  - ◇ identification approach: Blanchard and Perotti (2002)
  - ◇ estimation: country-by-country VAR or panel-VAR
- ◇ Using EMU countries, we find real appreciation (↑)
  - ◇ data: annual (relative)
  - ◇ identification approach: Choleski ordering

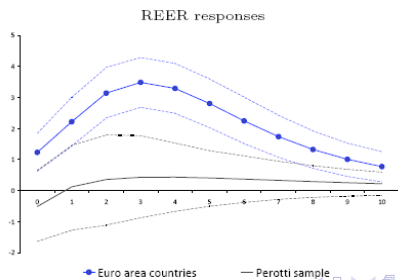
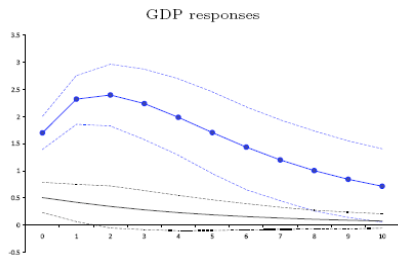
# Euro countries vs. Perotti sample: Shock to GEXP



◆ Euro area countries

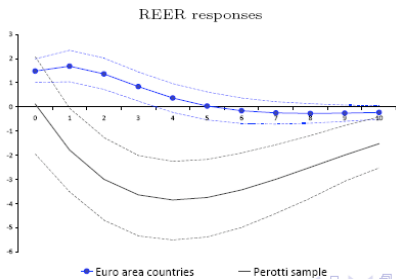
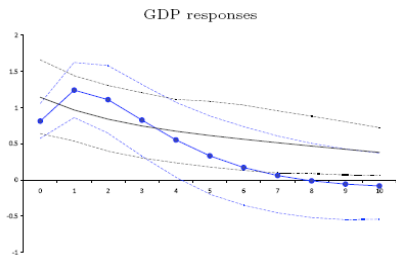
— Perotti sample

# Euro countries vs. Perotti sample: Shock to GINV



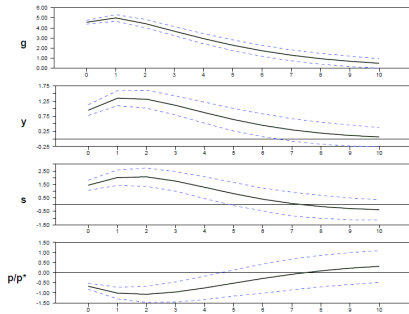
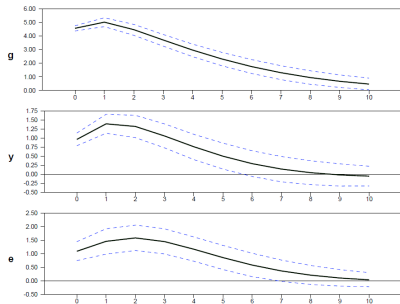
◆ Euro area countries    — Perotti sample

# Euro countries vs. Perotti sample: Shock to GC

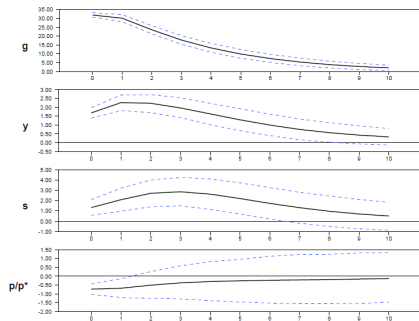
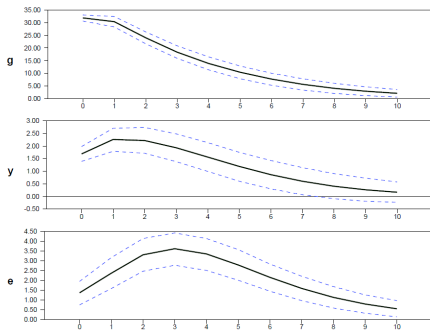


- EMU group: pre 1999 vs post 1999
- Perotti group

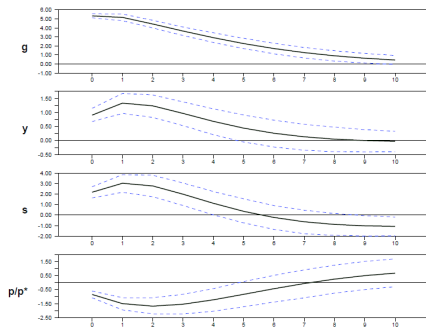
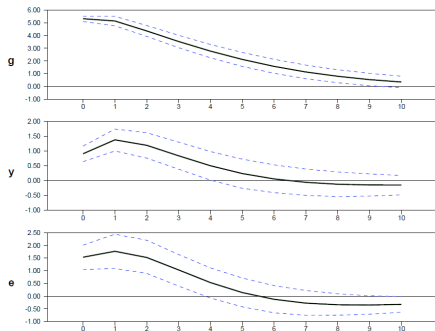
# Shock to GEXP 1970-98



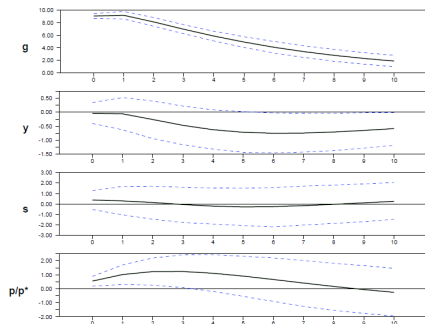
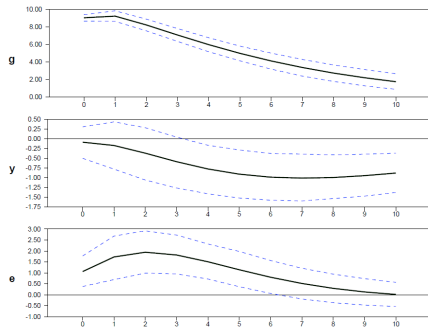
# Shock to GINV 1970-98



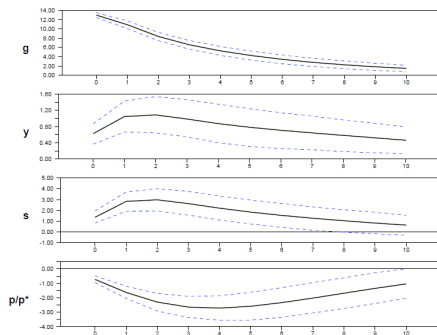
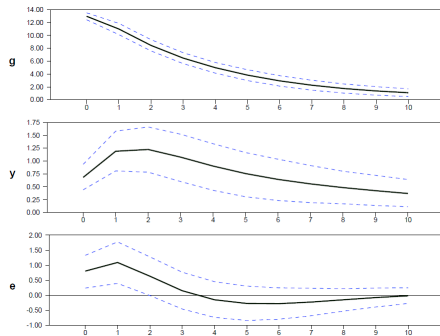
# Shock to GC 1970-98



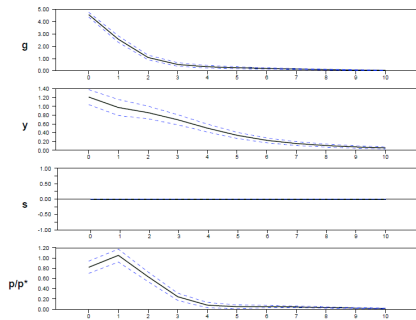
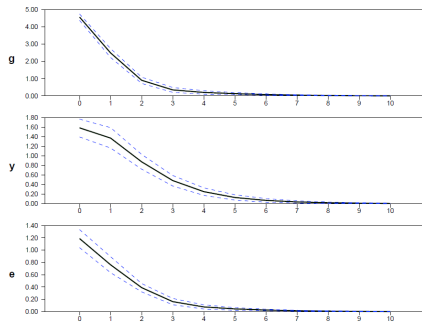
# Shock to WGC 1970-98



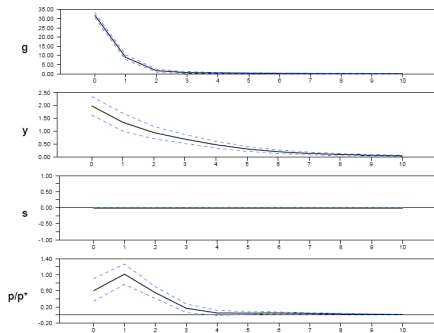
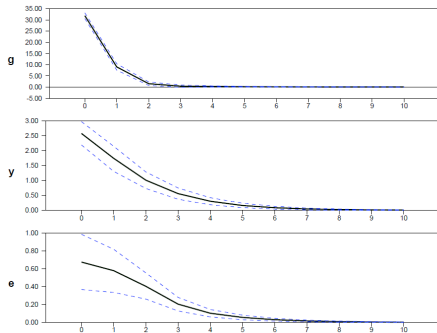
# Shock to NWGC 1970-98



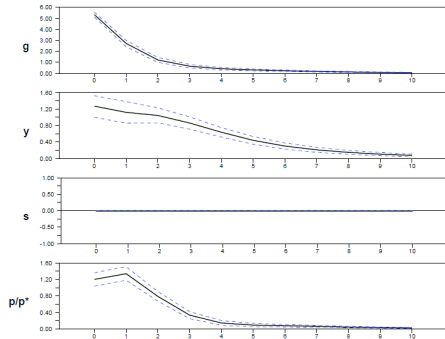
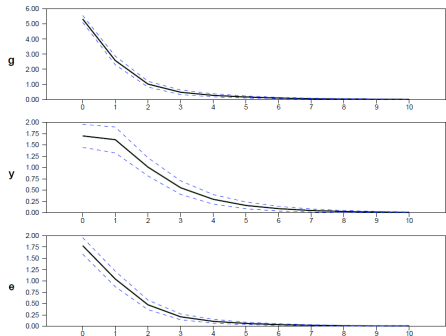
# Shock to GEXP 1999-06



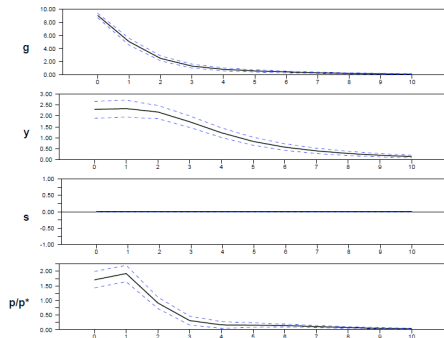
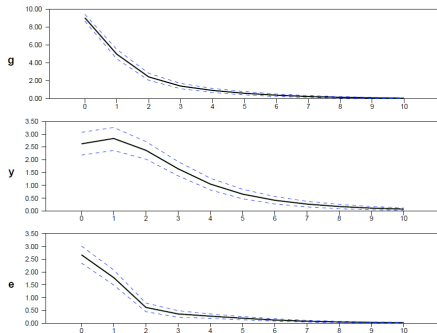
# Shock to GINV 1999-06



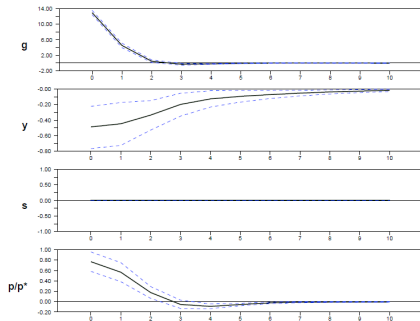
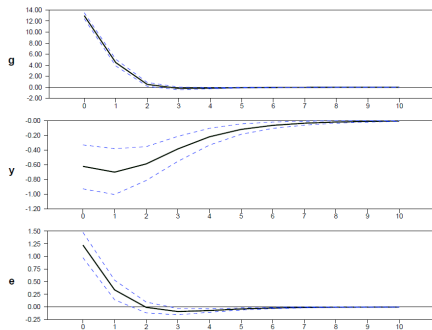
# Shock to GC 1999-06



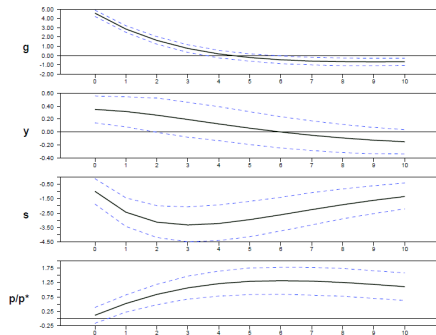
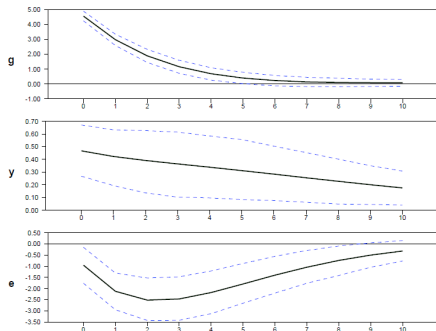
# Shock to WGC 1999-06



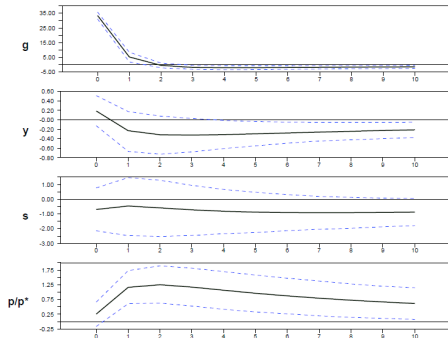
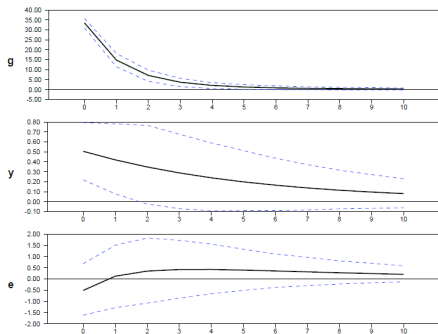
# Shock to NWGC 1999-06



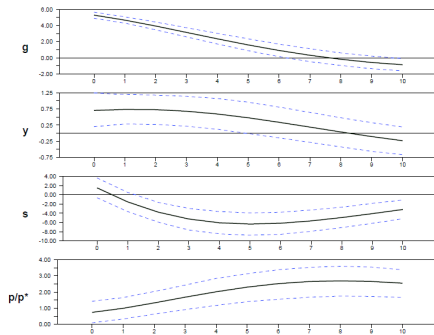
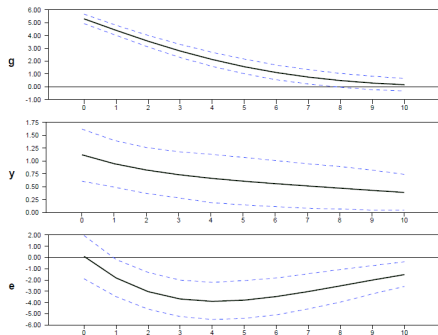
# Shock to GEXP Perotti sample 1970-06



# Shock to GINV Perotti sample 1970-06



# Shock to GC Perotti sample 1970-06



# Sectoral Composition of Output: Shock to GEXP

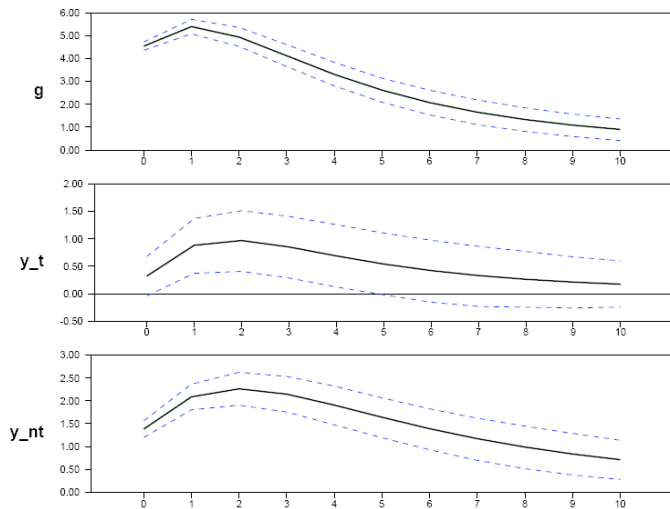


Figure: Shock to GEXP

# Sectoral Composition of Output

- Complement to sectoral relative price data
- Cross-check on transmission mechanism
- Medium-term implications of sectoral shifts in output

# Sectoral Composition of Output: Shock to GINV

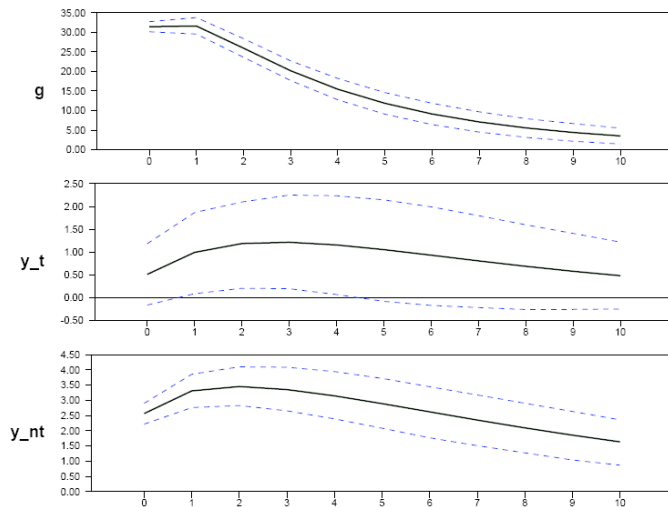


Figure: Shock to GINV

# Sectoral Composition of Output: Shock to GC

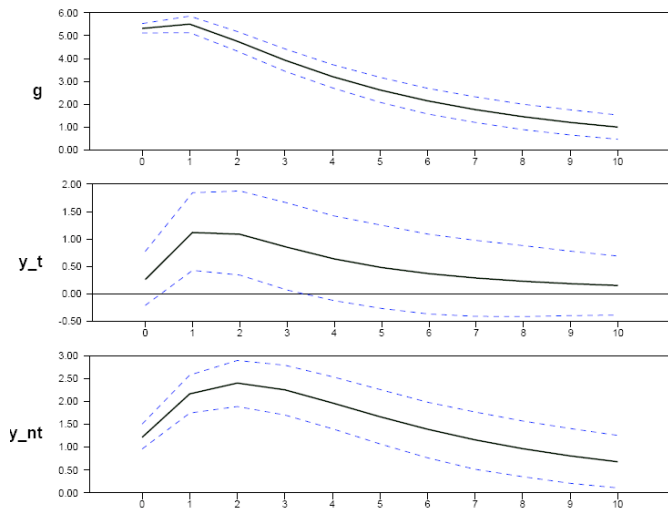


Figure: Shock to GC

# Sectoral Composition of Output: Shock to WGC

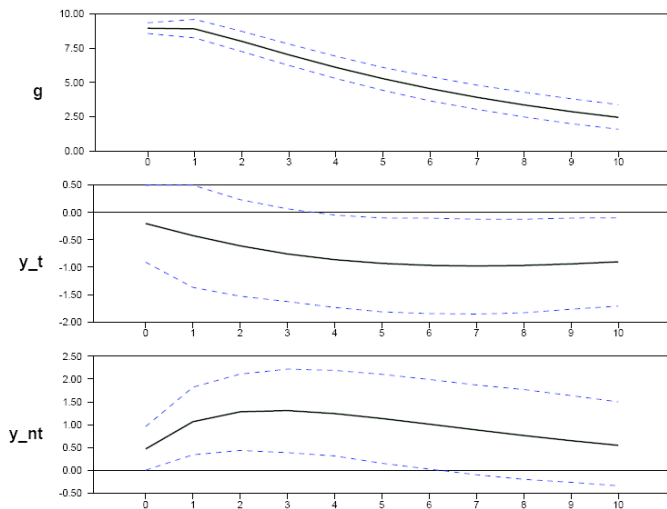


Figure: Shock to WGC

# Sectoral Composition of Output: Shock to NWGC

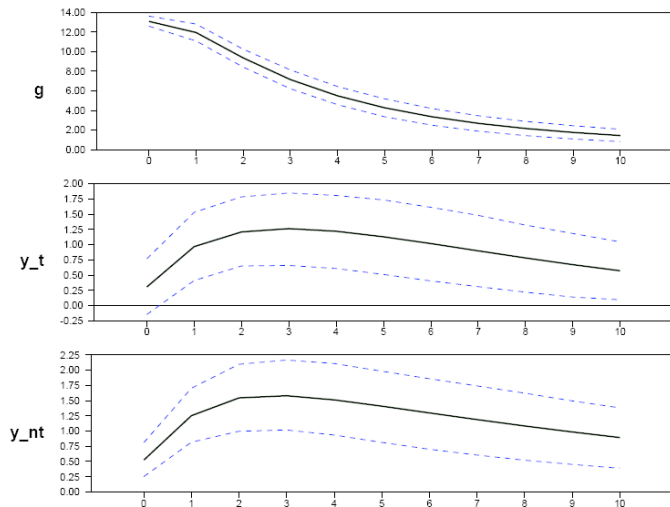


Figure: Shock to NWGC

- For EMU sample, RER typically appreciates in response to positive fiscal shock - but effect differs across types of spending
- Reconciliation with Perotti Sample: MP/ER regime
- Limits to Empirical Approach

- How to Create 'Fiscal Space'?
- Fiscal Policy and Macro Risks (External Position; Banking Stability)