Discussion of "Sectors, long-run restrictions, and the identification of tech. shocks" by Acconcia/Simonelli

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Context

- Huge discussion in the literature on the effects of tech. shocks on hours/unemployment (BQ [1989], Gali [1999,2004], Francis and Ramey [2002], Christiano, Eichenbaum, and Vigfusson [2003], Chang and Hong [2003])

- Common working hp: *Just one shock having* permanent *effects on* aggregate *labor productivity*. E.g. Gali [1999]:

$$\begin{bmatrix} \Delta x_t \\ \Delta H_t \end{bmatrix} = \begin{bmatrix} C(1)_{11} & 0 \\ C(1)_{21} & C(1)_{22} \end{bmatrix} \begin{bmatrix} \varepsilon_{z,t} \\ \varepsilon_{q,t} \end{bmatrix}$$

$$\text{IRFs on } y_t = C(L)\varepsilon_t : \frac{\partial H_t}{\partial \varepsilon_{z,t}} > 0 \Rightarrow \text{RBC,oth.NK}$$

Acconcia and Simonelli's research question:

Is the one-permanent shock hypothesis supported by the data?

Their strategy:

GDFA on *sectors*

Their finding:

Aggregate "non-tech." shock permanently affects sector-specific productivities

$\Rightarrow$ Doubts on the commonly assumed uniqueness of the permanent shock!

Economic framework

2-sector model (Greenwood et al [1997] 'manipulated)

$$C_t = Z_t F_C(K_t, L_t), I_t = Q_t Z_t F_I(K_t, L_t)$$

$$\ln Z_t = g_z + \ln Z_{t-1} + \varepsilon_{z,t}, \ln Q_t = g_q + (1-\rho) g_q t + \rho \ln Z_{t-1} + \varepsilon_{q,t}$$

Long-run properties: $\lim_{\tau \to \infty} \frac{\partial X_{t+\tau}}{\partial \varepsilon_{z,t}} > 0$, $\lim_{\tau \to \infty} \frac{\partial X_{t+\tau}}{\partial \varepsilon_{q,t}} \begin{cases} > 0 if \rho = 1 \\ = 0 if \rho < 1 \end{cases}$

Prediction of the model if $\rho < 1$: Aggregate non-permanent shock should *not* affect productivity across sectors in the long run.

Econometric approach

$$\underset{[Nx1]}{x_t} = \underset{[Nxm]}{\Gamma(B)} \underset{[mx1]}{\varepsilon_t} + \underset{[Nx1]}{\xi_t}, \Gamma(B)\varepsilon_t \perp \xi_t$$

- GDFA (Forni, Hallin, Lippi, and Reichlin [2002]): It allows to estimate the m common factors ε_t exploiting $N >> m$, and compute the (aggregate and sector-specific) IFRs to shocks to ε_t

- 2 variables per sector (labor productivity, hours), several sectors, US 2-digit SIC manufacturing industries, 1949-2000 (yearly data)

Findings

- 2 aggregate shocks explain most of the variance
- When a long-run restriction a la Gali [1999] is imposed on one of the two shocks, the authors replicate his results in aggregate terms ...
- ... but *the second aggregate shock has a positive and statistically significant effect on sector-specific productivity*! $\Rightarrow$ **Just one permanent shock hypothesis is rejected by the data (at sectoral level)!**
- Disaggregation illuminates on the underlying impact of common shocks, and cast doubts of commonly employed working hypothesis

My reaction

Nice paper, clear and well executed! Just a couple of questions ...

- Economic model (vs. econometric framework): No ξ_t! Any possibility of embedding sector-specific shocks?

- Common components: What are they? Correlations might help (Gali [2004]) ... e.g. technological shock if highly correlated with Gali [1999], Basu, Fernald, and Kimball [1999]; capital-income tax rate (Uhlig [2004]) if highly correlated with McGrattan [1994] ...

- Christiano, Eichenbaum, and Vigfusson [2003]: Any bias in the IRFs due to the ΔH_t vs. H_t discussion?