

Discussion of Riccardo DiCecio
“Comovement: It’s not a Puzzle”

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THE QUESTION

- Question: can we construct a coherent DSGE macro model that explains the comovement puzzle?
- Answer: Yes
- How: Nominal wage stickiness

THE COMOVEMENT PUZZLE

1. In a wide class of multi-sector models, TFP shocks move employment in various sectors in opposite directions

This is a puzzle given

- the empirical evidence
- the definition of business cycle

2. Intuition for the puzzle: absent frictions, resources are shifted quickly towards the sector where the returns are highest

Intuition for the solution of the puzzle: nominal wage stickiness impedes this flow of resources

Versions of this puzzle

1. Christiano, JME 1988: Inventory investment

SS return on K is higher than return on V , since inventories do not depreciate. Positive TFP shocks implies can lead to rise in K and fall in V , when K and V are substitutes

2. Christiano and Fitzgerald and Hornstein: Two-sector interpretation of the stochastic growth model

Technology can be used to produce C and K . Because of consumption smoothing reasons, C does not rise when A rises. Hence more workers produce K and few workers produce C

3. Two country RBC models

THE ANATOMY OF TWO SECTOR MODELS

1. The one sector as a two sector.

The social planner maximizes

$$E_0 \sum_{t=0}^{\infty} \beta^t u(c_t, n_{ct}, n_{it})$$

subject to:

$$c_t = Af(k_{ct-1}, n_{ct})$$
$$k_{it} + k_{ct} = Af(k_{it-1}, n_{it}) + (1 - \delta)(k_{it-1} + k_{ct-1})$$

Shocks to A generate negative correlation between n_c and n_i .

2. Greenwood and Hercowitz (JPE, 1991) and friends

“market” (non-durable) sector vs “non-market” (housing) sector

Only the producing the consumption good can produce capital.

$$E_0 \sum_{t=0}^{\infty} \beta^t u(c, h_t, l_{ct}, l_{ht})$$

subject to:

$$\begin{aligned} c_t + k_{ct} + k_{ht} - (1 - \delta_k)(k_{ct-1} + k_{ht-1}) &= y_t = F(k_{ct-1}, l_{ct}) \\ h_t &= H(k_{ht-1}, l_{ht}) \end{aligned}$$

3. Baxter (RESTAT, 1996) and friends

The sector producing durables also produces capital for the production of the consumption good (the opposite of GH).

$$E_0 \sum_{t=0}^{\infty} \beta^t u(c_t, h_t, l_t)$$

subject to:

$$y_t = f(k_{ct-1}, l_{ct}) = c_t$$

$$i_t = f(k_{ht-1}, l_{ht}) = h_t - (1 - \delta_h) h_{t-1} + k_{ct} - (1 - \delta_{kc}) k_{ct-1} + k_{ht} - (1 - \delta_{kh}) k_{ht-1}$$

IMPLICATIONS OF THIS CLASS OF MODELS

1. Because complexity grows with the square (or maybe a higher power) of sectors, anyone can search into these models for different empirical findings
2. Clear implication: sector-specific productivity shocks (obviously) and neutral productivity shocks (less obviously) tend to move inputs in the two sectors in opposite directions.

This at odds with data: job reallocation is not observed at business cycle frequencies.

Consequences?

1. Reject technology shocks as sources of business cycles OR
2. Fix the model under the null that technology shocks matter (RICCARDO'S WAY)

RICCARDO'S CHOICES

1 Model structure

Standard DSGE model with a consumption-producing sector and an investment-producing sector

wage and price rigidities a-la Calvo in both sectors (workers are not identical, goods are not identical)

Shocks: neutral technology shocks vs investment specific shocks, monetary shocks (no demand shocks)

Main finding: Wage rigidity can solve the comovement puzzle

Intuition: A positive technology shock does not change wages too much
→ less incentive to move labor from one sector to another in response to shocks

Important: Wage rigidity is not assumed a priori

2 Main comments

- Structural change and estimation period (1959-2004)
 1. The US economy is much more stable now in the aggregate (break in 1980s)
 2. Much more unstable when one looks at some components of the aggregate
 3. (1) and (2) imply that comovement has gone down

- Estimation

1. The estimation does not use data on the key model variables: INPUTS in different sectors

Hard to understand the reason for this choice

The VAR could shed light on these issues.

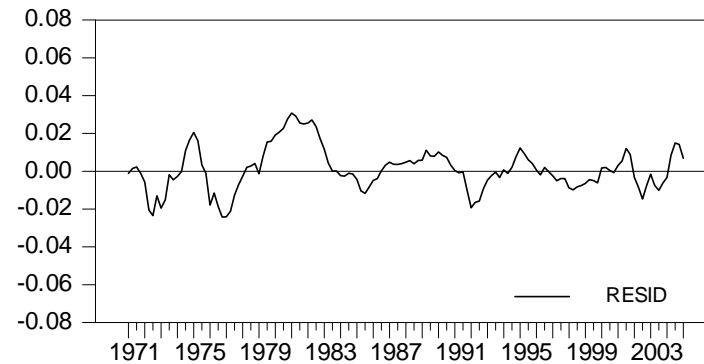
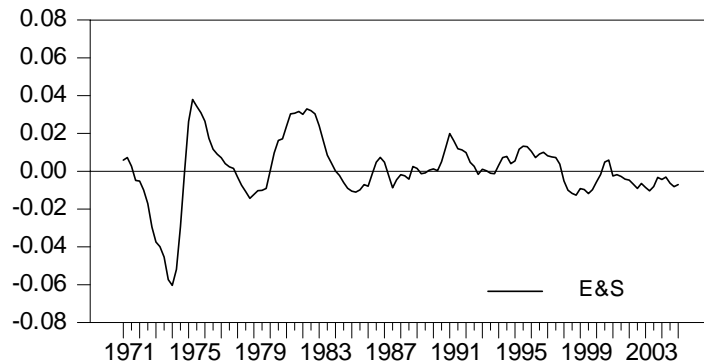
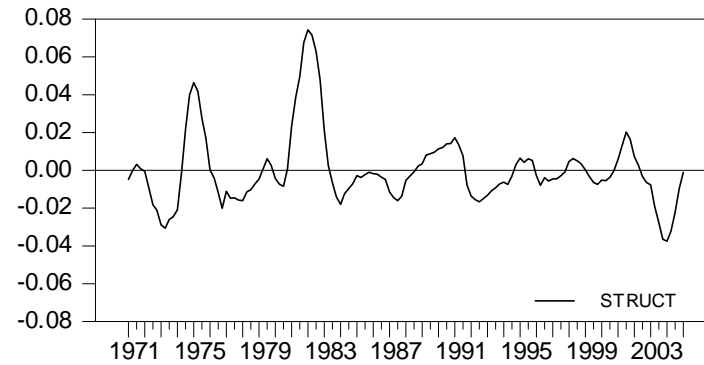
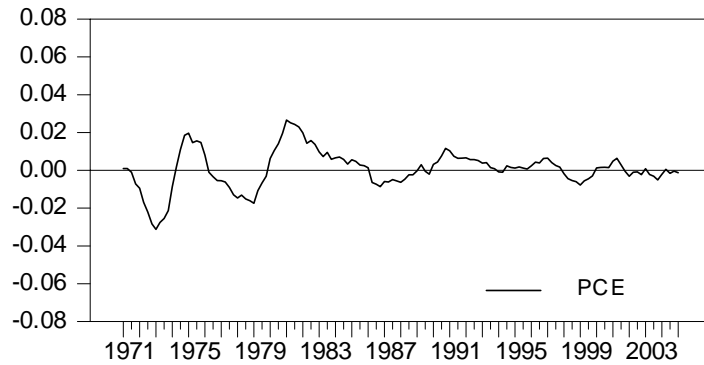
2. This is a puzzle: data on sectoral inputs should be informative in singling out sticky wages as the key vs other competing explanations

- The comovement and the nature of the shocks

1. Riccardo has strong prior on possible sources of business fluctuations, and works under the untested assumption that only shocks driving fluctuations are technology and monetary
2. Alternative approach would be to look at other shocks, that generate comovement in absence of the mechanism in his paper. For instance:
 - preference shocks
 - wealth shocks
 - news shocks
 - inflation shocks

- The properties of the estimated model

1. consumption goods prices change on average every 2 quarters
2. investment goods prices change every 4 quarters



- Band-Pass Filtered Price Indices For
- 1) Personal Consumption Expenditures
 - 2) Fixed Investment, Structures
 - 3) Fixed Investment, E&S
 - 4) Fixed Investment, Residential

3 Concluding comment

Great and well-executed paper