Discussion of “Optimal Monetary Policy in Production Networks”
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FRBSF Conference on “Macroeconomics and Monetary Policy”

26 March 2021
Question and Results

How should a central bank conduct monetary policy in an economy with

- Nominal rigidities
- Multiple sectors
- Sectoral linkages (production network)

Main finding: Stabilize price index by assigning higher weight to sectors that

1. Are larger, stickier and more upstream
2. Have less sticky upstream suppliers but stickier downstream customers

Output gap stabilization approximates fully optimal policy
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A SSGE Model with Multiple Sectors

- Imperfectly competitive producers of varieties within each sector
  - Technology uses labor and inputs produced by other sectors
  - Sector-specific technology shocks
  - Nominal rigidity: Technology shock imperfectly observable
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- Central bank controls quantity of money (nominal demand)
What Do We Learn from This Paper?

- Compare this paper with two-sector NK model without production network in Woodford (2003)
  - Labor only input in production
  - Perfectly observable sector-specific technology shocks
  - Staggered price setting (Calvo, 1983)
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- Two dimensions
  1. Nominal rigidities as imperfect information
  2. Production network
Approximated Equilibrium Conditions

- **Sectoral Phillips curves**
  \[ \pi_{jt} = \kappa_j (x_t + \gamma_j q_t) + \beta E_t \pi_{jt+1} \]
  
  - \( q_t \rightarrow \) Price of good 2 relative to good 1 (in log-deviations from flexible-price counterpart)
    - Endogenous cost-push shock
  
  - \( \gamma_1 \propto n_2 \rightarrow \) Size of sector 2 weights importance of relative price for inflation in sector 1
    - Similarly, \( \gamma_2 \propto - n_1 \)
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- Relative price dynamics

\[ q_t = q_{t-1} + \pi_{2t} - \pi_{1t} + \Delta p^*_R \]

where \( p^*_R \) is price of good 2 relative to good 1 in flexible-price equilibrium
Loss Function

- **Per-period loss**

\[ L_t = w_1 \pi_{1t}^2 + w_2 \pi_{2t}^2 + \lambda_x x_t^2 + \lambda_q q_t^2 \]

where \( w_j \propto n_j/\kappa_j \Rightarrow \) Increasing in

- Size of sector \( j \)
- Degree of price rigidity in sector \( j \)
Loss Function

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- In general,

  - Impossible to stabilize all objectives simultaneously
Loss Function

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  - If \( q_t \) varies over time, impossible to stabilize \( \pi_1 t, \pi_2 t \) and \( q_t \) simultaneously
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- In general,

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  - If \( q_t \) varies over time, impossible to stabilize \( \pi_{1t}, \pi_{2t} \) and \( q_t \) simultaneously
  - Suboptimal to stabilize aggregate inflation (\( \pi_t \equiv n_1 \pi_{1t} + n_2 \pi_{2t} \))
Fix average price stickiness and let relative weight on sector 2 vary
Benigno (2004): Nearly optimal to stabilize

\[ \tilde{\pi}_t = \phi \pi_{1t} + (1 - \phi) \pi_{2t} \]

where \( \phi = \Phi(\alpha_1, \alpha_2) \)

Welfare losses under \( \tilde{\pi}_t = 0 \) (optimal index) virtually indistinguishable from optimal policy
Optimal Policy and Alternative Rules

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Quantitative version in Eusepi, Hobijn and Tambalotti (2011)

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where \( \phi = \Phi(\alpha_1, \alpha_2) \)

Large welfare losses under \( \pi_t = 0 \)
(consumption-based index)

Optimal Policy and Alternative Rules

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$$\tilde{\pi}_t = \phi \pi_{1t} + (1 - \phi) \pi_{2t}$$

where $\phi = \Phi(\alpha_1, \alpha_2)$

Output gap stabilization ($x_t = 0$) performs relatively well

Nature of nominal rigidities ⇒ Static versus dynamic distortions
  ▪ Stabilize price level (information friction) vs. inflation rate (Calvo)
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Does Calvo model imply excessively high costs of inflation?
  ▶ Output gap stabilization closely approximates optimal policy in this paper
  ▶ Stabilization of stickiness-weighted index not much better than CPI targeting or Domar-weighted index
Taking Stock

- **Nature of nominal rigidities** ⇒ **Static versus dynamic distortions**
  - Stabilize price level (information friction) vs. inflation rate (Calvo)

- **Does Calvo model imply excessively high costs of inflation?**
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- **Role of production network not so clear-cut**
  - Hard to fully disentangle from role of stickiness
  - Stickiness (and size) seem to prevail on upstream/downstream and connectedness