

# Monetary Policy and Production Networks: An Empirical Investigation

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- **Contribution.** First econometric study on the contribution of production networks to the effect of monetary policy shocks on economic activity
- **Main result.** Production networks substantially **contribute to monetary non-neutrality** in the short run and their presence accounts for **20%-45% of the effect of monetary policy shocks** on US consumption

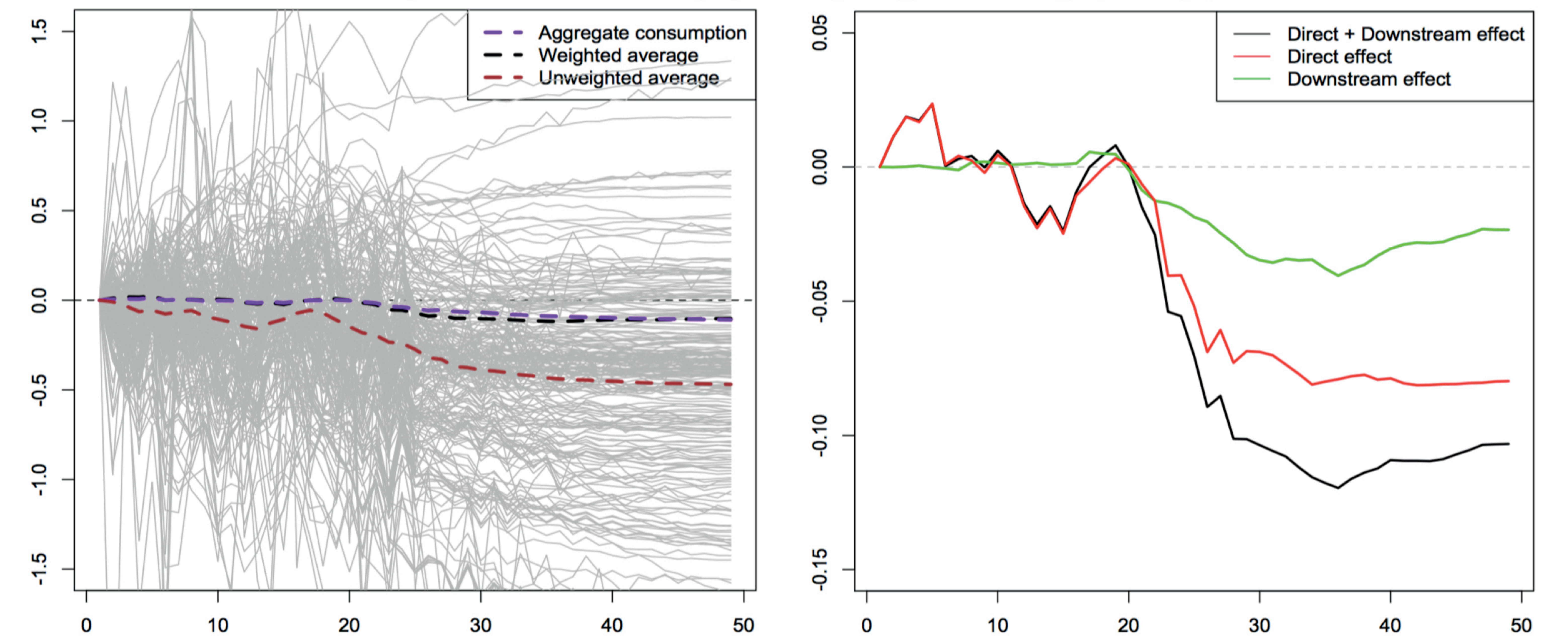
## Model: roundabout production and sector-specific price rigidity

- Production:  $Y_{kt} = L_{kt}^{1-\delta} (\prod_r Z_{kt}^{\omega_{kr}}(r))^{\delta}$ ,  $\{\omega_{kr}\}$  entries of input-output table
- Flexible prices:  $P_{kt} = \frac{\theta}{\theta-1} MC_{kt} \sim W_t^{1-\delta} (\prod_r P_{rt}^{\omega_{kr}})^{\delta}$ , suppliers' prices in MC
- Rigid prices: sector-specific probability  $\alpha_k$  of prices remaining fixed
- Monetary policy:  $M_t = NGDP_t = P_t^c C_t$ ,  $\ln M_t = \ln M_{t-1} + r_t$ ,  $r_t$  is MP shock
- Effect of MP shock  $r_t$  on final consumption in sector  $k$  (log-linearised):

$$c_{kt} = \underbrace{\alpha_k c_{k,t-1} + \alpha_k r_t}_{\text{Direct effect}} + \underbrace{(1 - \alpha_k) \delta \sum_{r=1}^K \omega_{kr} c_{rt}}_{\text{Downstream effect}}$$

(↑ in own rigidity) **Direct effect** + **Downstream effect** (↓ in own rigidity)

## Surprise monetary policy tightening (25bp)



## Econometric strategy

- Run the following regression for every sector:
- $$\Delta c_{kt} = \eta_{k0} + \sum_{j=1}^{12} \eta_{kj} \Delta c_{k,t-j} + \sum_{j=1}^{24} \phi_{kj} r_{t-j} + \sum_{j=1}^{12} \psi_{kj} \sum_{r=1}^K \omega_{kr} \Delta c_{r,t-j} + \epsilon_{kt}$$
- Estimate the **downstream effect** for every sector as the difference between **full** and **restricted** ( $\hat{\psi}_{kj} = 0, \forall j$ ) IRFs to a surprise 25bp MP shock
  - Aggregate IRFs using consumption shares as weights ( $c_t = \sum_{k=1}^K \omega_{ck} c_{kt}$ )

## Data (monthly)

- Sectoral consumption: match NIPA product consumption series to BEA sector classifications (231 sectors) for 1987:1-2007:12
- IO table: combine 2007 BEA “MAKE” and “USE” tables
- Consumption weights: 2007 BEA “USE” table
- MP shocks: Romer and Romer (2004)