

Financial frictions across the production network and the transmission of monetary policy

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KEY CONTRIBUTION

- Introduce a multi-sector model with financial frictions.
- Show bi-directional transmission (top-down and bottom-up) of interest rate changes in the model.
- Run model-based local projections and show evidence of up-stream and downstream transmission of monetary policy.

MODEL

Setup:

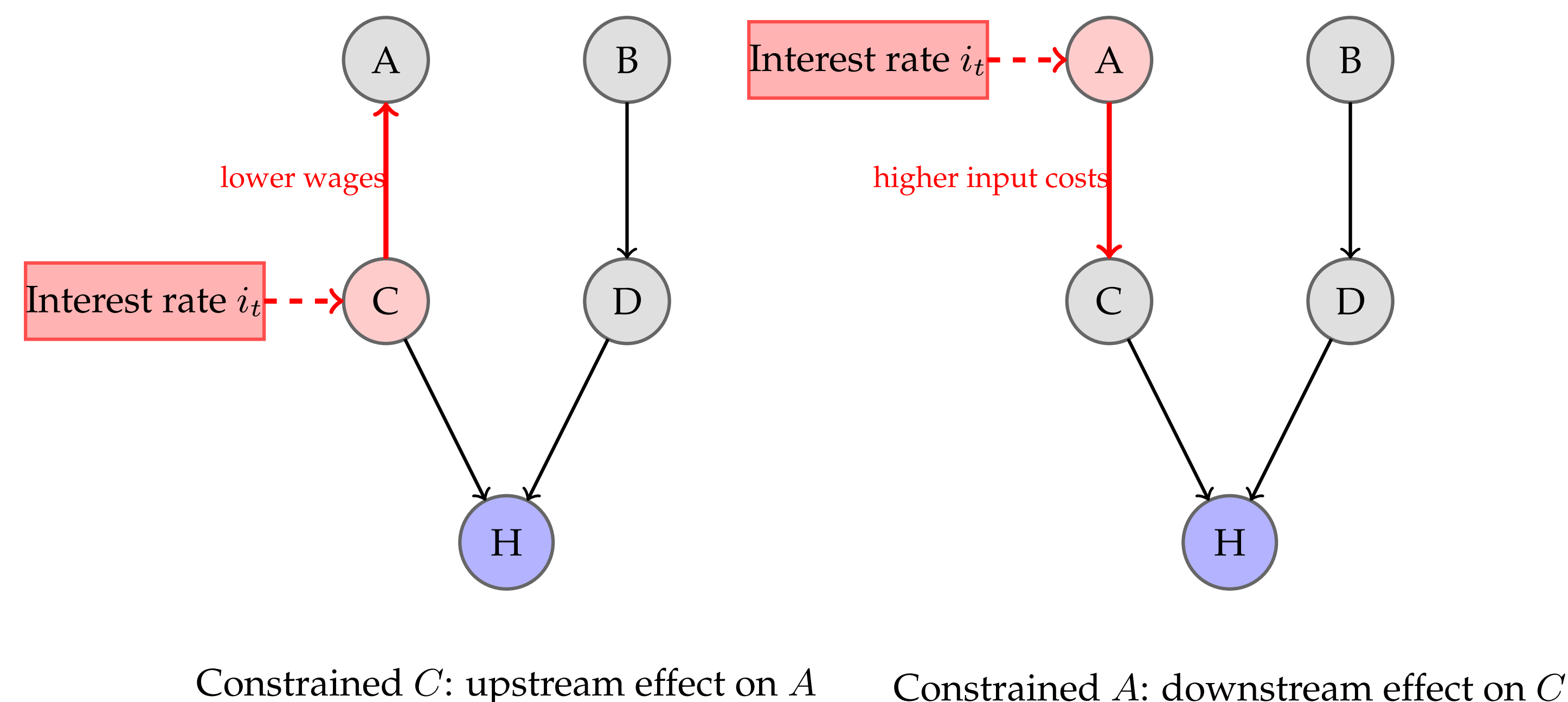
- Multi-sector production network with CES household demand and Cobb-Douglas production
- Sector k must pre-finance fraction φ_k of inputs at gross cost $1 + i_t \varphi_k$
- Sector k : labor share α_k , input-output weights $\omega_{k,j}$

Prices and revenues:

$$p_k = (1 + i_t \varphi_k) \frac{1}{A_k} w_k^{\alpha_k} \left(\prod_{j=1}^n p_j^{\omega_{k,j}} \right)^{1-\alpha_k}, \quad (1)$$

$$p_k y_k = p_k c_k + \sum_{j=1}^n \omega_{j,k} p_j y_j. \quad (2)$$

Mechanism (rate increase):



EMPIRICAL SPECIFICATION

$$\Delta_h y_{ic,t+h} = \underbrace{\beta_1^h \varphi_{ic,t_{12}-1} \times s_t}_{\text{Direct leverage effect}} + \underbrace{\beta_2^h \Phi_{ic,t_{12}-1} \times s_t + \beta_3^h \tilde{\Phi}_{ic,t_{12}-1} \times s_t}_{\text{Indirect leverage effect}} + \beta_4^h s_t + \dots + \epsilon_{ic,t+h} \quad (3)$$

$$\Phi_{ic,t_{12}} = (1 - a_{ic,t_{12}}) \sum_{j,d} 1(j \neq i, d \neq c) \omega_{ic,jd,t_{12}} \times \varphi_{jd,t_{12}} \quad (4)$$

$$\tilde{\Phi}_{ic,t_{12}} = (1 - \tilde{a}_{ic,t_{12}}) \sum_{j,d} 1(j \neq i, d \neq c) \tilde{\omega}_{ic,jd,t_{12}} \times \varphi_{jd,t_{12}}$$

- $y_{i,c,t+h}$: sectoral price or output for sector i in country c at horizon h .
- s_t : monetary policy shock.
- $\phi_{i,c,t-1}$: sectoral own financial position.
- $\Phi_{i,c,t-1} / \tilde{\Phi}_{i,c,t-1}$: upstream / downstream financial exposure.

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EMPIRICAL RESULTS

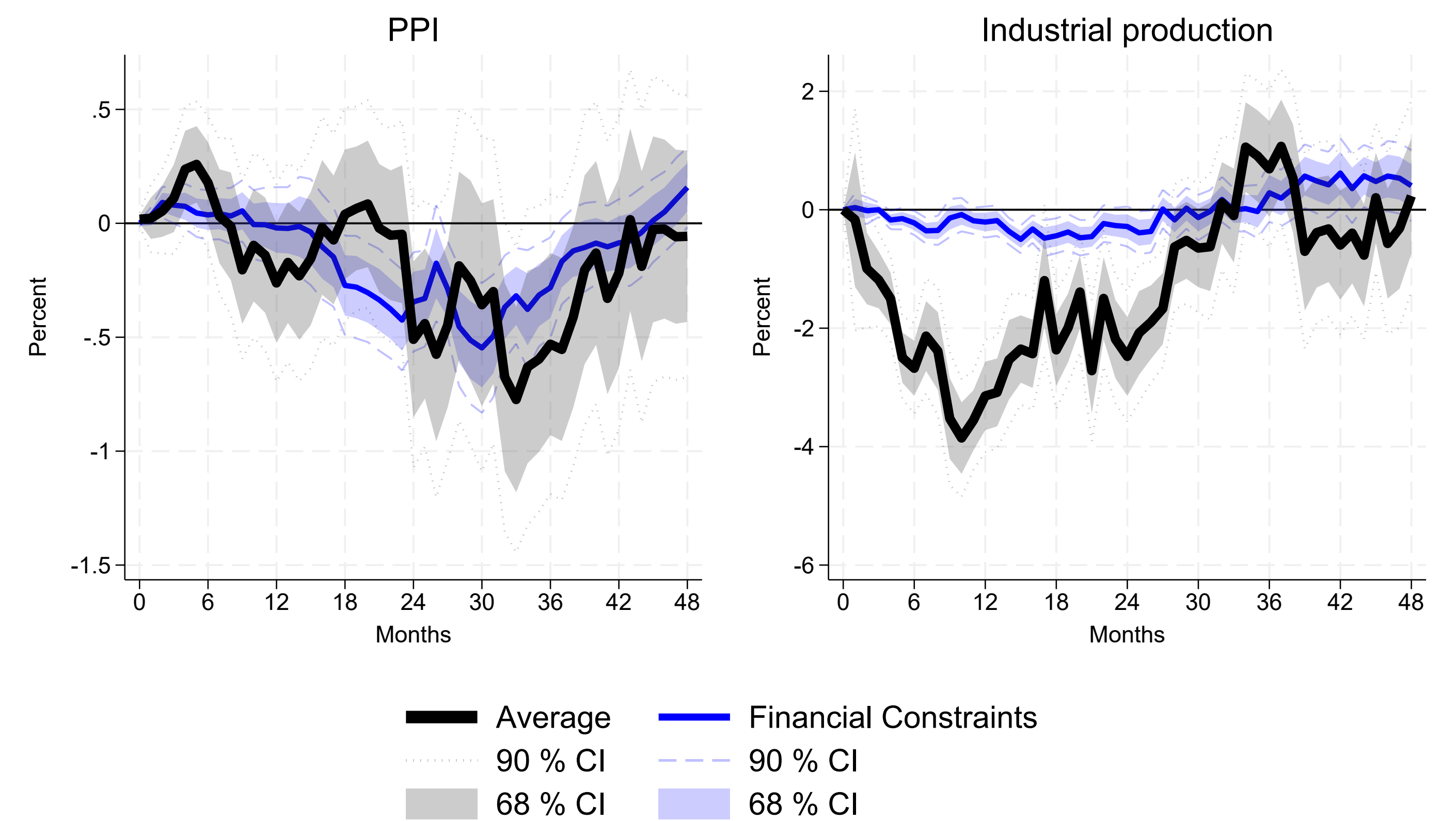


Figure 1: Impulse responses to monetary policy tightening shock

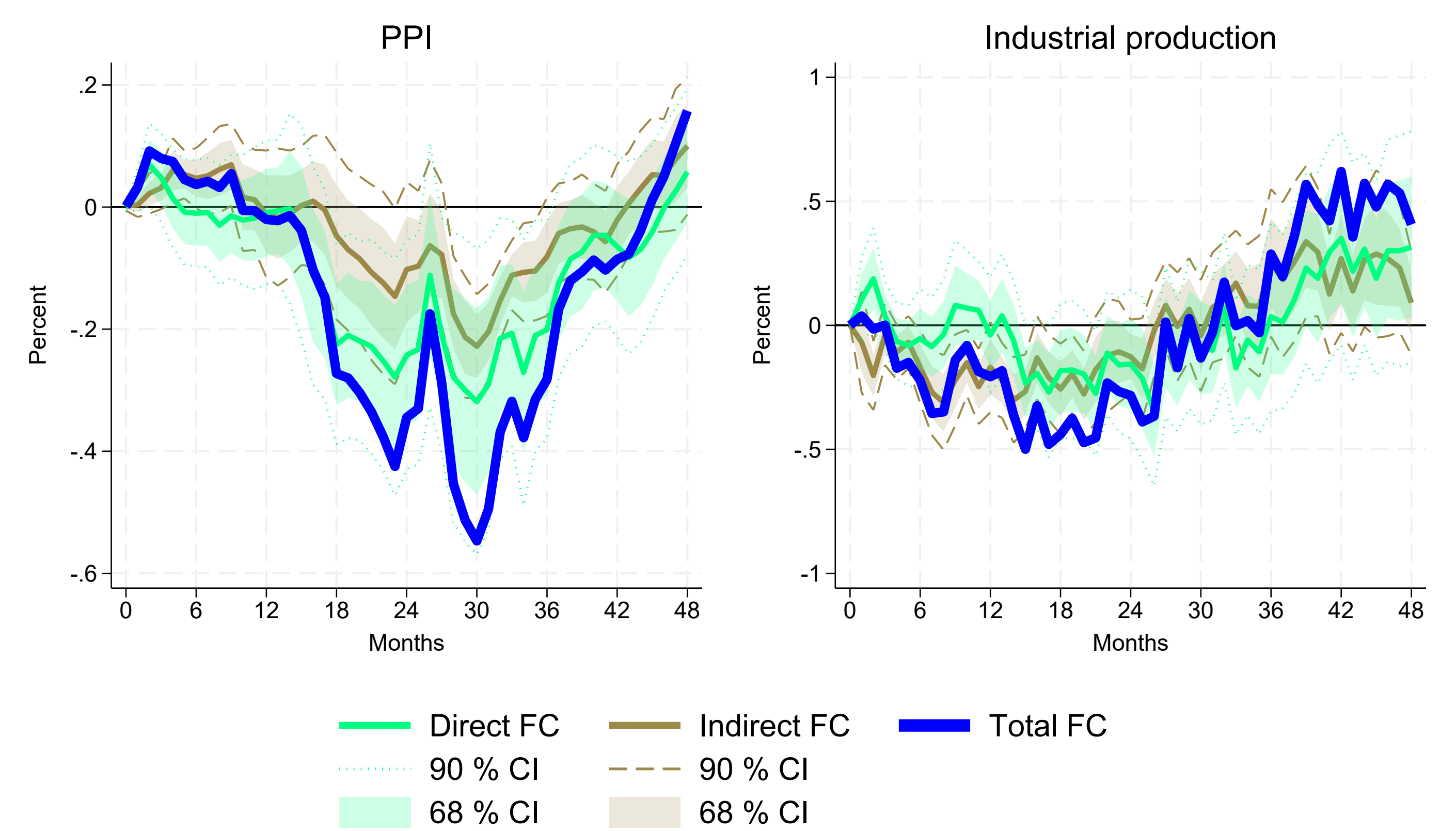


Figure 2: Own vs. network financial frictions effects

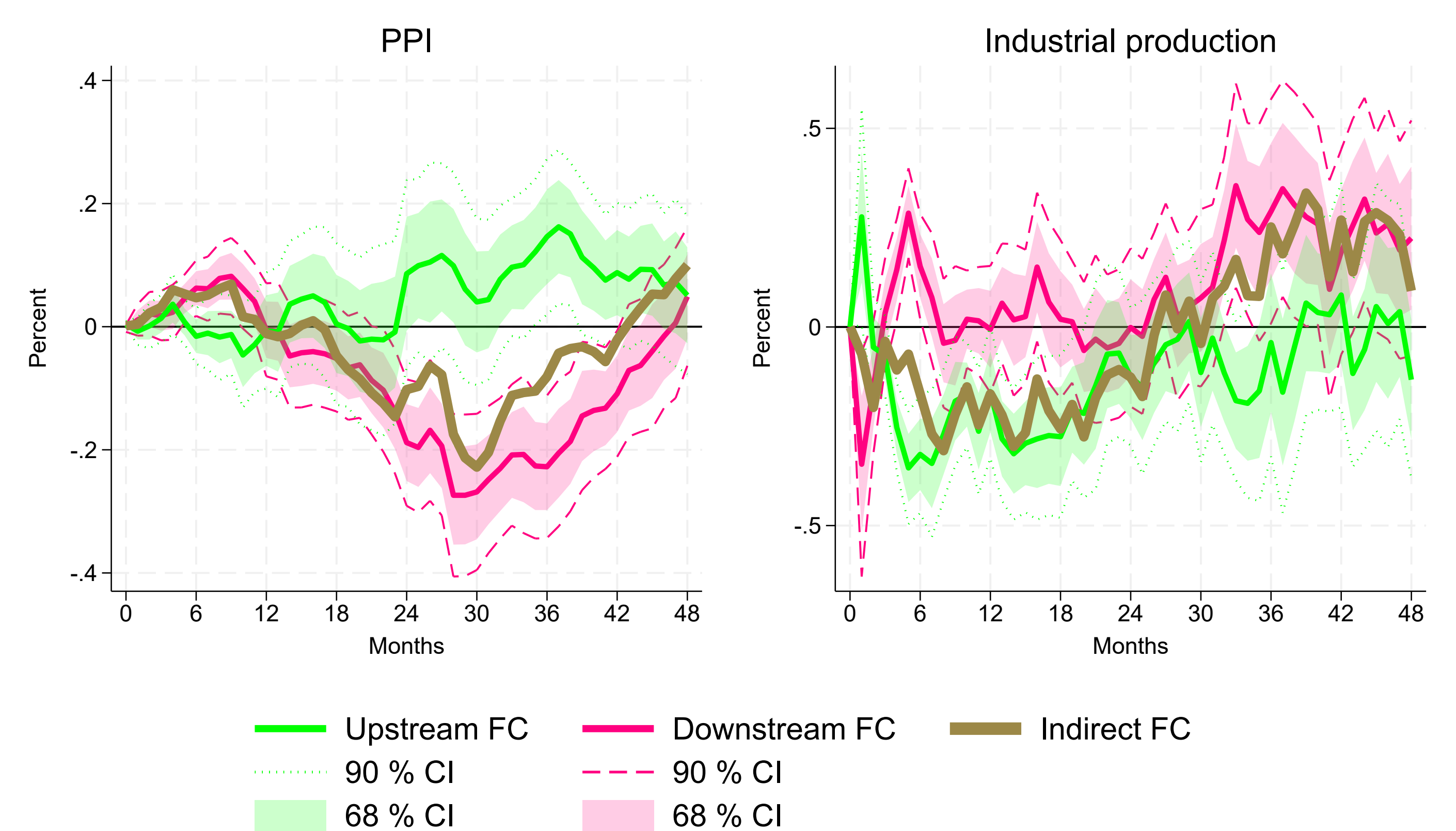


Figure 3: Upstream vs. downstream financial frictions effects

POLICY IMPLICATIONS & CONCLUSIONS

- Monetary policy impact varies across sectors due to financial positions.
- Up- and downstream leverage exposure affect prices in opposite directions.
- Central banks should account for sectoral leverage and network positions jointly when assessing transmission.