Discussion

A Multi-sector Production Network Model for the Euro Area

Christoffel, Dobrew, Gebauer, Höynck, Lisack, Mazelis and Müller

Javier Quintana[§]

[§] Banco de España

The views expressed in this presentation are those of the authors and **do not** necessarily represent the views of the Bank of Spain or the Eurosystem.

Overview and Motivation

- Does accounting for production networks matter for monetary policy?
- Recent inflation shocks in the euro area have been driven by sector-specific disturbances.
- These shocks propagate through input-output linkages across sectors.
- Can monetary policy be improved by incorporating this network structure?
- What is the role of sectoral heterogeneity in price and wage setting?

Model Overview

- NK model for the euro area with 8 sectors:
  - Agriculture, Energy, Food, Manufacturing, Construction, Services, Transport, Public.
- Features:
  - Sector-specific price and wage stickiness.
  - Imperfect mobility of capital and labor.
  - Production network calibrated from FIGARO IO tables.
- Monetary policy follows a Taylor-type rule, potentially responding to sectoral inflation.

Key Findings

- **Monetary shocks:**
  - Output and investment rise; inflation increases modestly.
  - Strongest sectoral responses: agriculture and energy.
- **Technology and risk-premium shocks:**
  - Mixed responses across sectors depending on factor intensities and rigidities.
- **Heterogeneity matters:**
  - Inflation dynamics are strongly influenced by network linkages and sector-specific frictions.
  - Real variables (GDP, consumption) less affected.

Monetary Policy Implications

- Optimizing the central bank's rule suggests:
  - Stronger response to output and inflation than typical calibrations.
  - Best performance when responding to **services inflation**, not headline or core.
- Services inflation provides a cleaner signal of underlying trends.
- Supports a case for disaggregated information in monetary policy design.

Comment: How Important is Aggregation in Disaggregated Models?

- 8 sectors, 2 countries
- Do results (quantitative and qualitative) change with finer disaggregation?
- In practice, only Energy and Agriculture are truly "upstream" sectors
- Differences in industrial structure across EA countries
  - Interaction with fragmented labor markets
- Relevant for calibrating substitution elasticities
- Switching-off the network: is the IO matrix already quasi-diagonal?

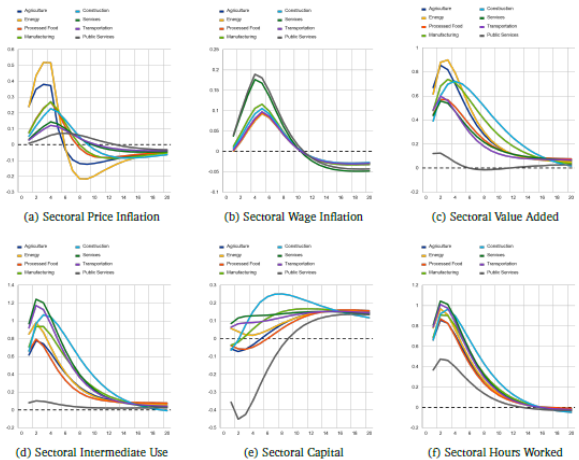


Figure 2: Propagation of an monetary policy shock. *Notes*: This figure shows the impulse responses of selected sectoral observables to an expansionary monetary policy shock ϵ_t^R. The shock decreases interest rates by 25 basis points on impact. The impulse responses are given as percentage deviations from the non-stochastic steady-state, apart from the impulse responses of the rates of inflation, which are plotted as annualised percentage point deviations.

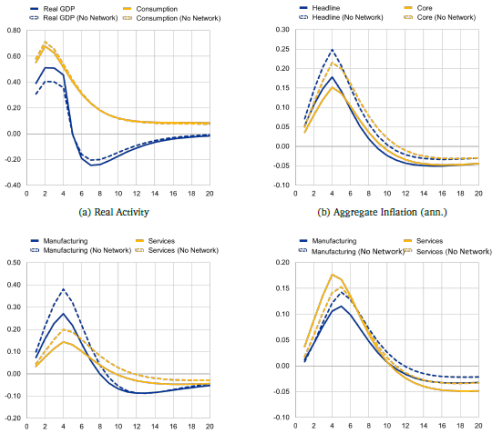
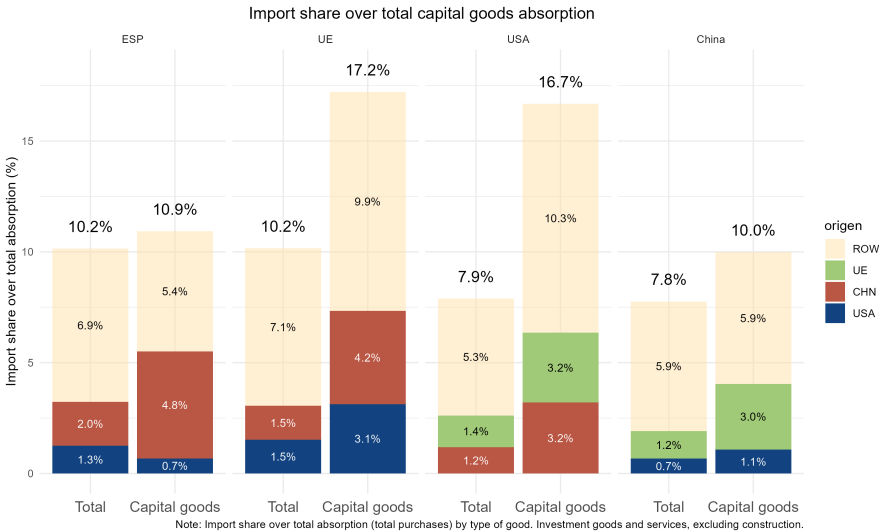


Figure 3: The Role of the Production Network. *Notes:* This figure shows the impulse responses of selected aggregate and sectoral variables to an expansionary monetary policy shock ϵ_t^R. The shock decreases interest rates by 25 basis points on impact. The solid lines represent the impulse responses of the baseline calibration. The dashed lines depict the counterfactual without intersectoral linkages in the economy. The impulse responses are given as percentage deviations from the non-stochastic steady-state, apart from the impulse responses of the rates of inflation, which are plotted as annualised percentage point deviations.

Comment: The Role of Investment

- Generic investment bundle: missing the sector-to-sector supply of capital goods? (Covarrubias et al. 2025)
- Relevant for tracing demand shocks followed by monetary policy shocks
- Ripple effects from sectoral inflation differences (real estate vs. other tangible vs. intangibles)
- Highly integrated supply chain, both within the EA and with third countries
  - Application to tariff scenarios


Import share over total capital goods absorption
ESP
UE
USA
China
Import share over total absorption (%)
0
5
10
15
10.2%
6.9%
2.0%
1.3%
10.9%
5.4%
4.8%
0.7%
10.2%
7.1%
1.5%
1.5%
17.2%
9.9%
4.2%
3.1%
7.9%
5.3%
1.4%
1.2%
16.7%
10.3%
3.2%
3.2%
7.8%
5.9%
1.2%
0.7%
10.0%
5.9%
3.0%
1.1%
Total
Capital goods
Total
Capital goods
Total
Capital goods
Total
Capital goods
origen
ROW
UE
CHN
USA
Note: Import share over total absorption (total purchases) by type of good. Investment goods and services, excluding construction.

Comment:

Minor comments:

- Role of expectations: how do sectors anticipate the arrival of staggered cost shocks?
- Are consumer prices and producer prices adjusted at the same frequency?
- Assumption of unitary elasticity between value added and the intermediate input bundle.
- Price response of the energy sector to a monetary policy shock.