The real meaning of the Fed information effects: good and bad news for Europe

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Introduction and empirical strategy

This paper

- Examines the real economic effects of CBI channel at international level: Fed news shocks $\Rightarrow$ EA production
- **How does a US economic expansion transmit to the EA via GVCs?**
- Answer depends - if European businesses trade partners or competitors to American counterparts.
- Brings forth new evidence:
  - US boom is good news for some, bad for other EA industries – does not come through observing aggregate effect;
  - distinct from Fed monetary effects;
  - transmitted cross-border via trade links (EA exporters); international prices (EA importers) & FX rates (non-trade-linked producers)

Background: foreign demand shock under study

I take the series of Jarocinski & Karadi (2020).

Literature yet to pin down what they really are, especially from an int'l macroeconomic viewpoint.

$\Rightarrow$ For these Fed info shocks to accurately proxy the state of US economy:

1. Fed needs to be correct about the state of the economy
2. markets must be able to interpret the announcement and translate it *accurately* into equity valuation

- But stock prices are noisy and prone to sentiments... low signal-to-noise ratio?
- So will **real economy follow suit** from HF stock price reactions?

A network-based measure of trade exposure to US

Forward participation

- to what extent the industry is a **supplier to the US**
- how much of its VA ends up in US via **direct and indirect trade**

Backward participation

- to what extent the industry is **supplied by US** i.e. an **ultimate importer** from the US

To deal with input-output linkages, compare industries w/ **strong one-sided exposure** to US

- compute (separate) dummies equal to 1 if the industry is among top-quarter of fw- or bw-participating in the distribution

IO table | Formula

Related literature

Fed as a global central bank

- **Global demand shocks from US**: Bernanke (2015), Miranda-Agrippino & Rey (2020), Rey (2013) – financial
- **Trade links**: Degasperi et al. (2023), Dedola et al. (2017), Iacoviello & Navarro (2019), Kim (2001), Georgiadis (2016) – MP w/ global view

Policy shock transmission in production networks

- di Giovanni & Hale (2021), Ozdagli & Weber (2017), Ghassibe (2021), di Giovanni & Rogers (2022) – MP

Central bank (non-monetary policy) shocks

- **HFI**: Miranda-Agrippino & Ricco (2021), Cieslak & Schrimpf (2019), Jarocinski & Karadi (2020)
- **Real effects**: Jarocinski & Karadi (2020), Hansen & McMahon (2016) – domestic; Jarocinski (2022), Georgiadis & Jarocinski (2023), and Pinchetti and Szczepaniak (2023) – w/o trade links
- **International effects**: Hoek et al. (2022), Jarocinski (2022), Cesa-Bianchi & Sokol (2022) – financial; Gürkaynak et al. (2021), Stavrakeva & Tang (2019) – FX;

Main empirical framework

Industry-level monthly data from 12 EA countries, from **2000:m1 to 2017:m12**

Panel local projections:

$$x_{t+h,ir} - x_{t-1,ir} = \beta_h^{\epsilon}\epsilon_t + \phi_h^{fw}\{fw_{ir}\epsilon_t\} + \phi_h^{bw}\{bw_{ir}\epsilon_t\} \ldots$$
$$+ \boldsymbol{\psi}_{sh}\boldsymbol{z}_{s,t,ir} + \tau_{h,ir} + \eta_{t+h,r} \qquad \text{for } h = 0, 1, \ldots, 35$$

where $x_{t+h,ir} \equiv$ (log) industrial production, $\alpha_{h,r} \equiv$ constant, $\epsilon \equiv$ Fed shock, bw $\equiv$ backward participation, $fw \equiv$ forward participation, $\tau_{ir} \equiv$ country-industry FE and $\eta_{t+h,r} \equiv$ residual;

$\boldsymbol{z} \equiv$ controls for financial channel, sentiments and economic activity ($+$ lags of dependent & shock). All vars

Main results:

EA response to Fed information shock

Average response to Fed information vs. monetary effects

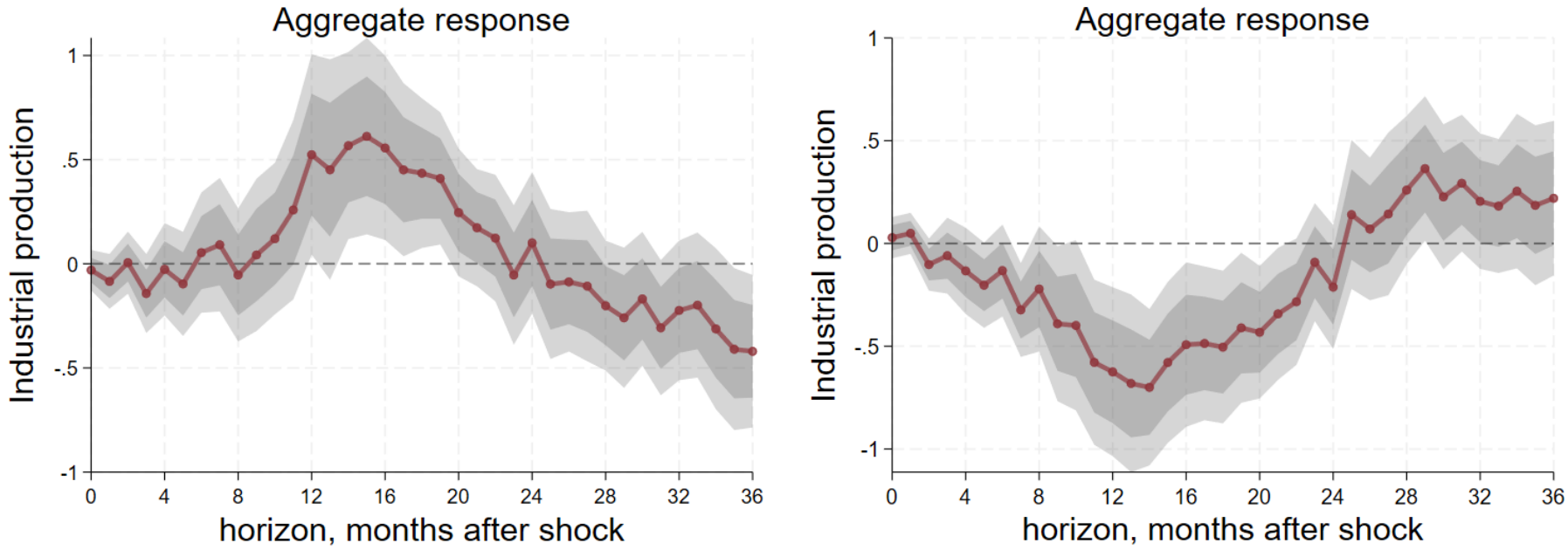
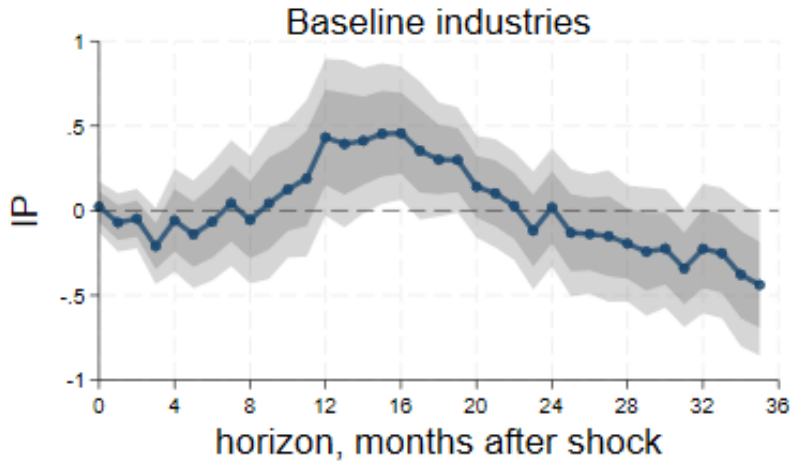


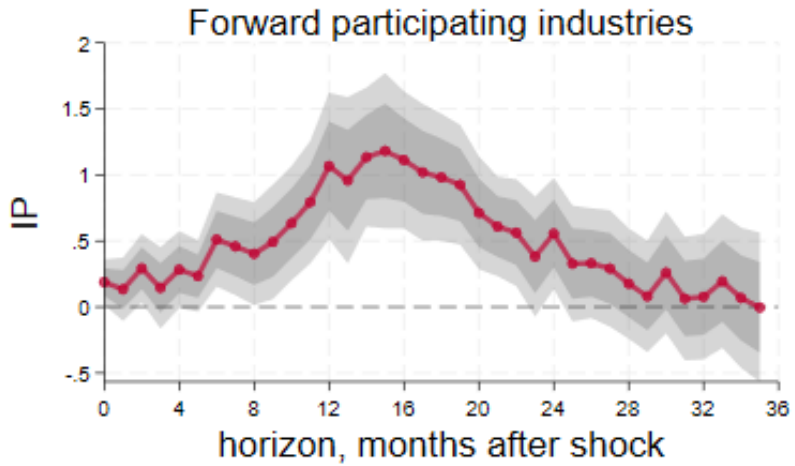
Figure: *Jarocinski-Karadi (2020) shocks*

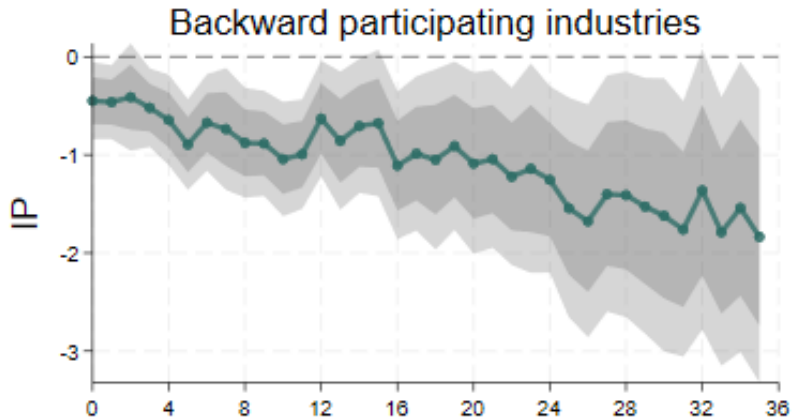
- Average response of EA production, pooling all industries;
- **Left**: Impact of 1 st. dev. Fed monetary tightening;
- **Right**: Impact of 1 st. dev. positive Fed info shock;

Overall response

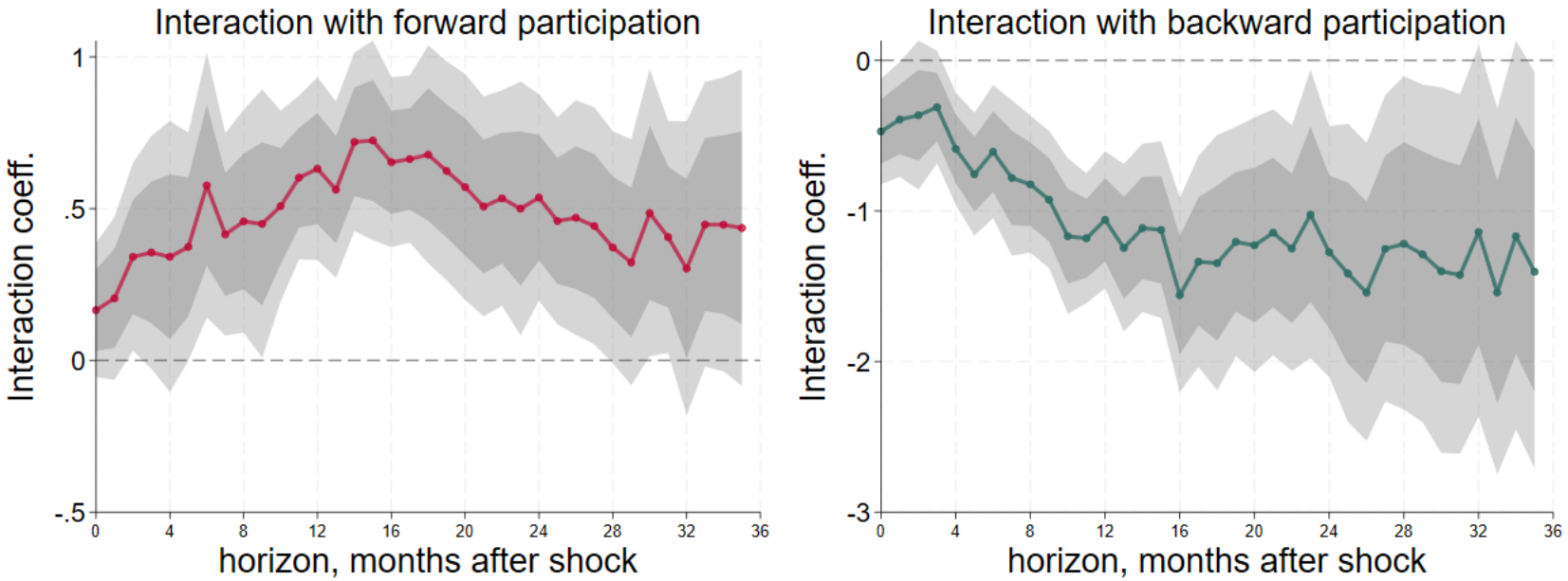
- Impact of 1 st. dev. positive Fed info shock;
- Overall effect: main term + interaction coefficients i.e. $(\beta_h^\epsilon + \phi_h)$ in LP
- 68% and 90% confidence bands (all graphs).







Interaction coefficients: Fed info x US trade exposure



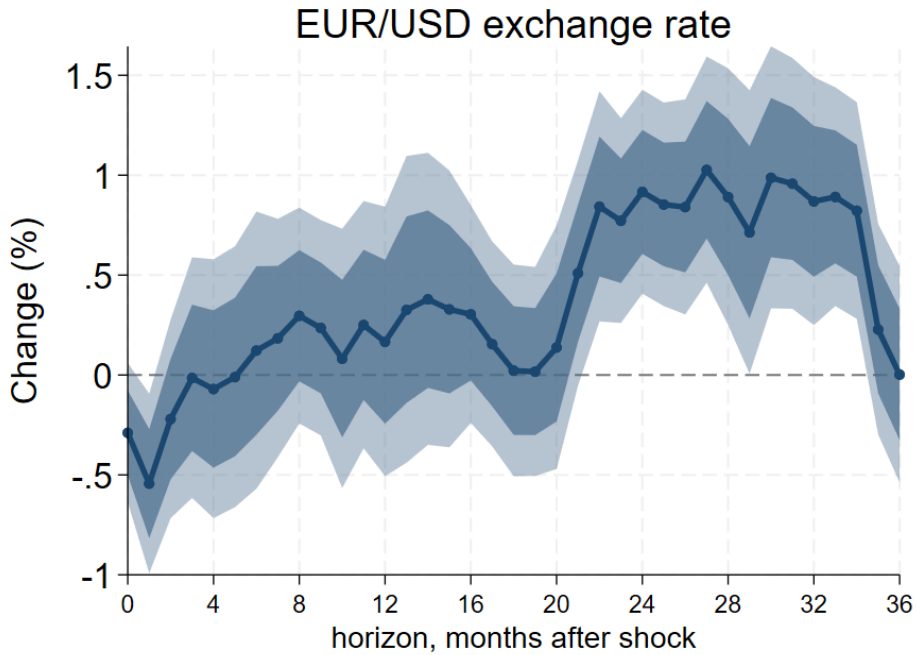
$\Rightarrow$ ultimate exporters' (left) production boosted by up to 0.75 percent

$\Rightarrow$ ultimate importers' (right) production harmed by up to 1.5 percent

- Impact of 1 st. dev. positive Fed info shock
- Interaction coefficients only (i.e. ϕ_h)

Expenditure-switching channel

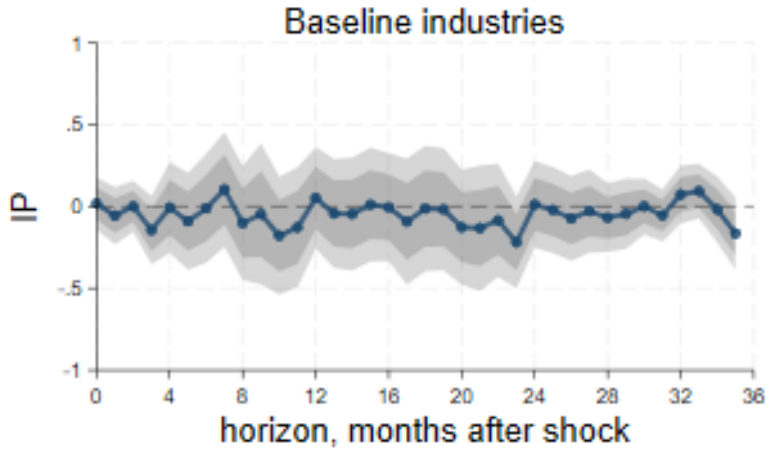
Exchange rate

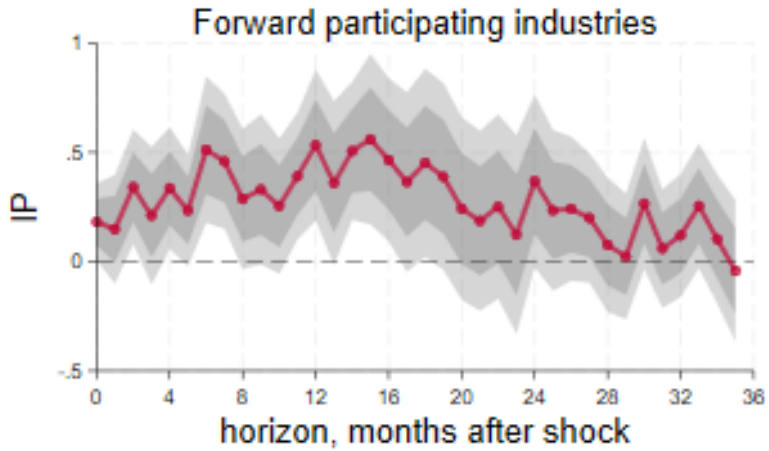


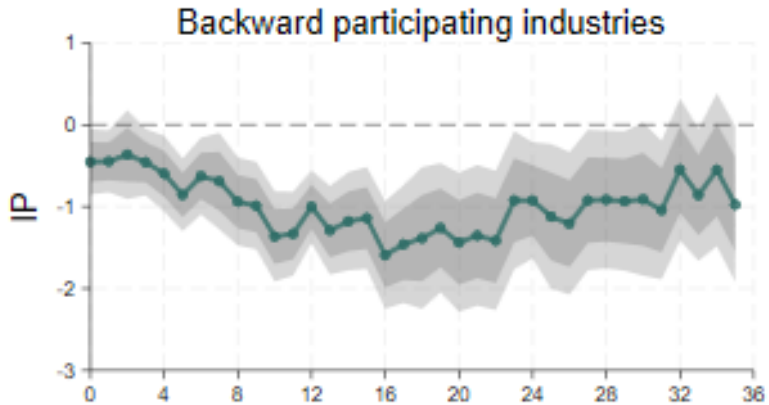
- Impact of 1 st. dev. positive Fed info shock;
- Simple lag-augmented LP of Fed info shock on EUR/USD-rate

Controlling for FX path

- USD broad value & FX(€/$)-rate added as controls;
- Non-US exposed industries no longer boosted by US economic expansion;
- Bulk of the effects on US-exposed EA industries not driven by FX response.



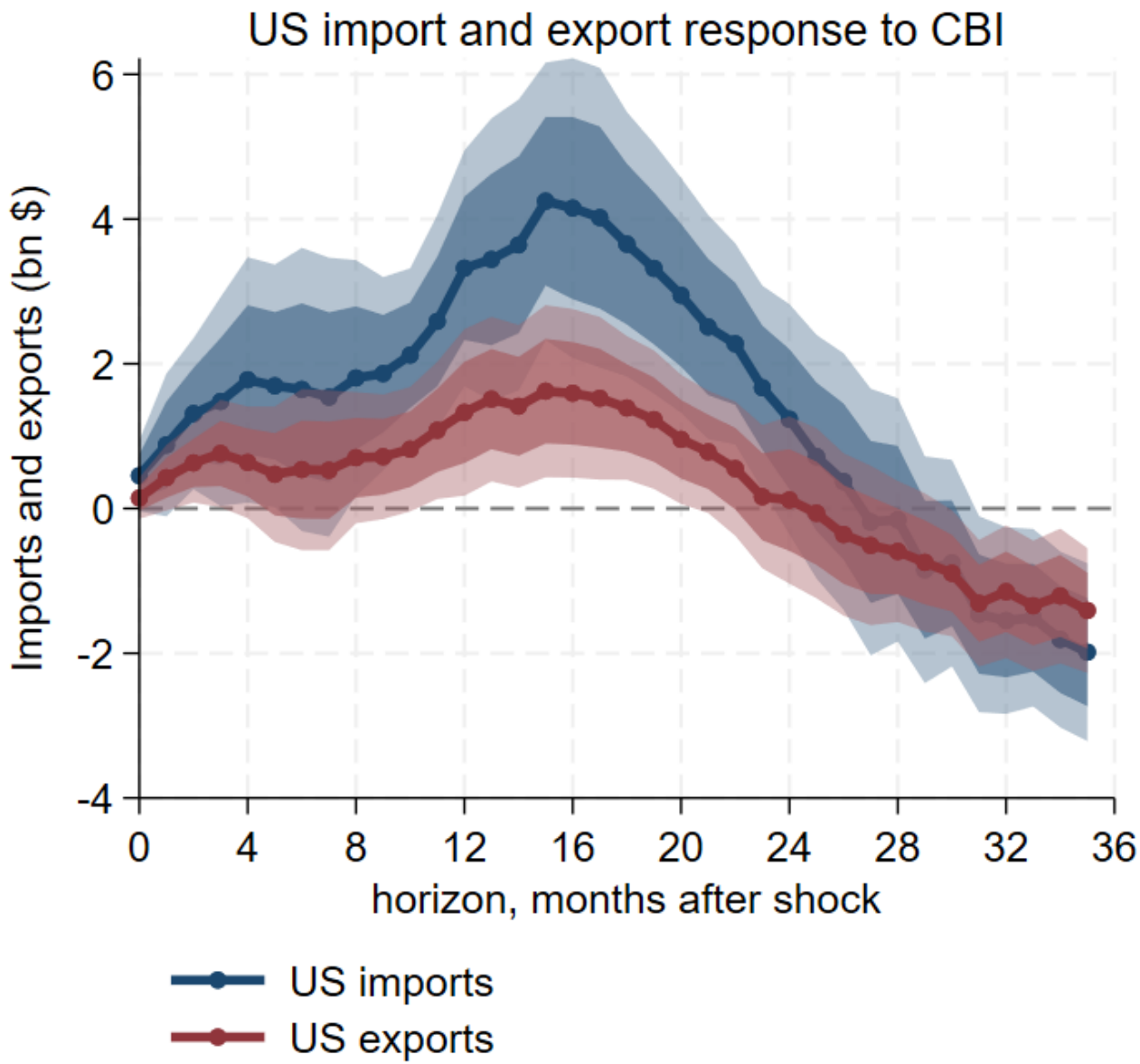




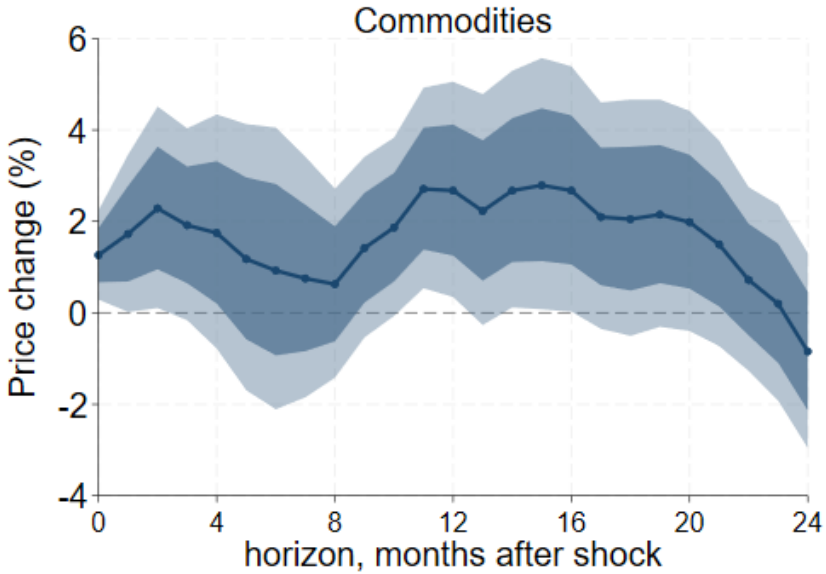
Oil price & USD value interaction

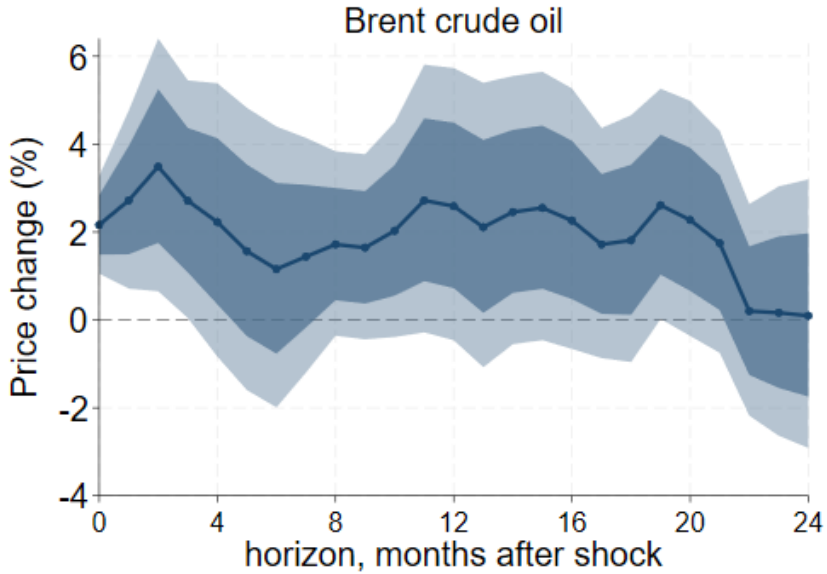
US imports and exports

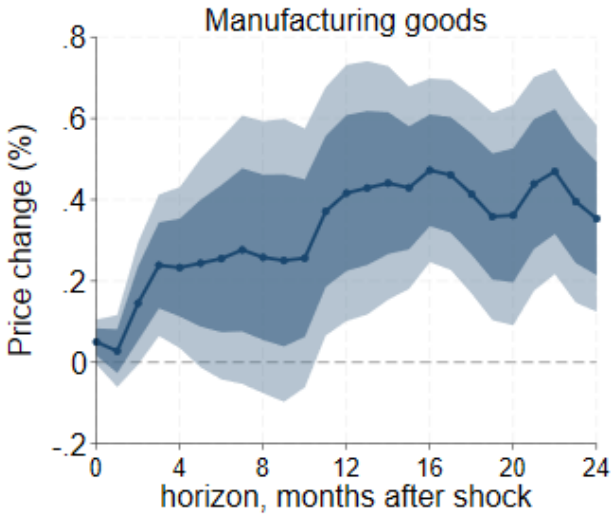
Net imports

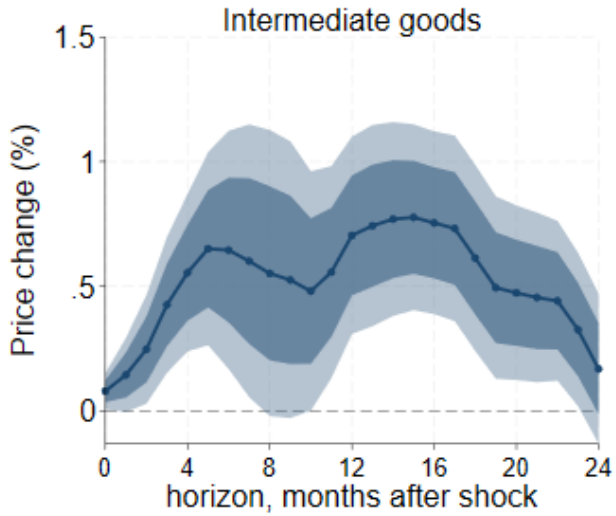


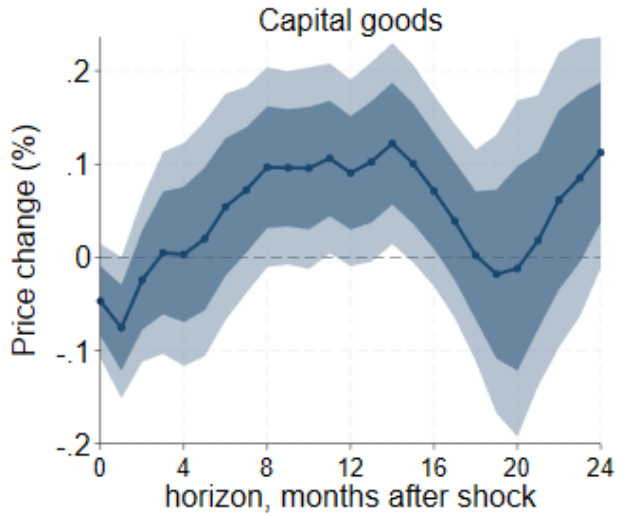
Price effects



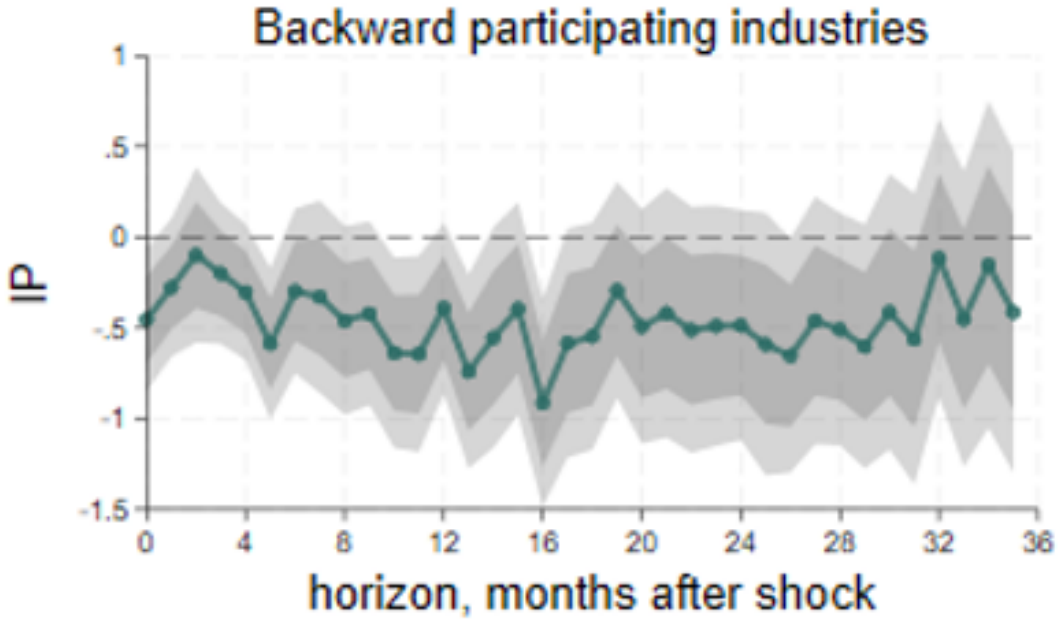








Controlling for FX & oil paths

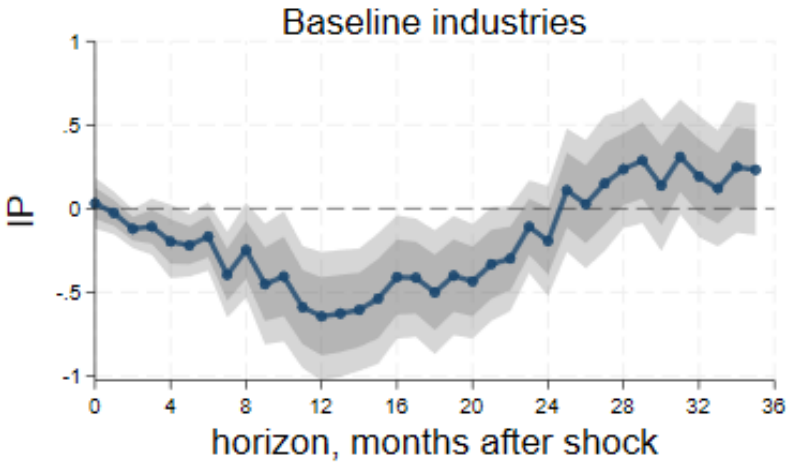


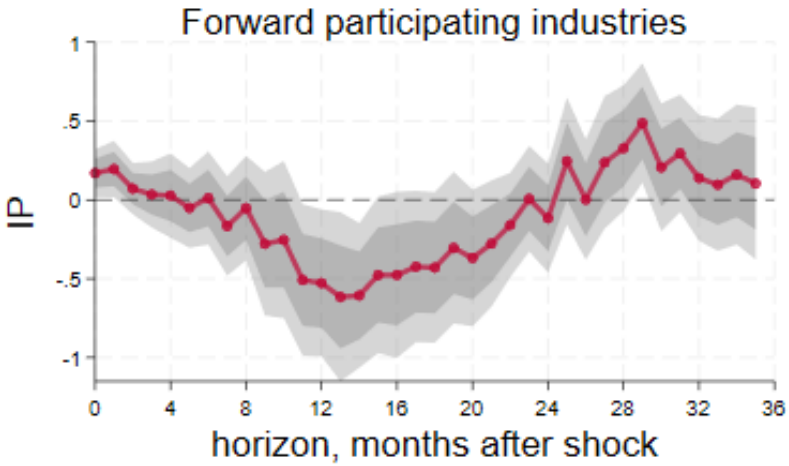
- Harmful effect of US boom on EA importers **substantially mitigated**;
- (EA exporters much the same; still boosted by US expansion);
- EA importers experience US economic expansion much like an adverse supply shock.

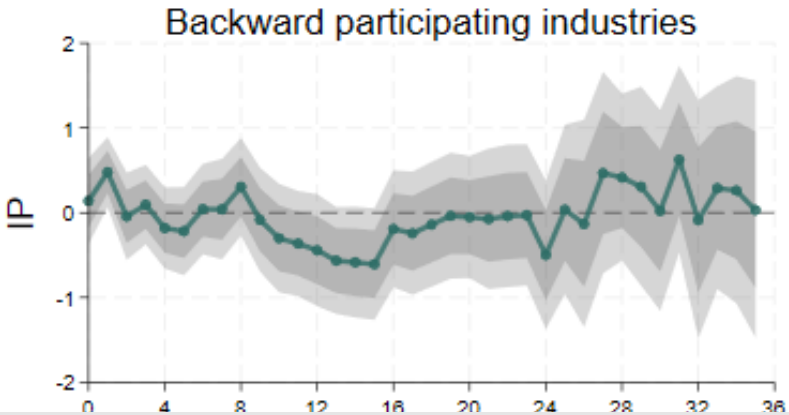
Results 3: response to Fed monetary shock

Overall response

- Impact of 1 st. dev. Fed monetary tightening on EA production;
- Overall effect: main term + interaction coefficients i.e. $(\beta_h^\epsilon + \phi_h)$ in LP
- **Less clear-cut heterogeneous effects** depending on US trade exposure.







Interaction coefficients: Fed tightening x US trade exposure

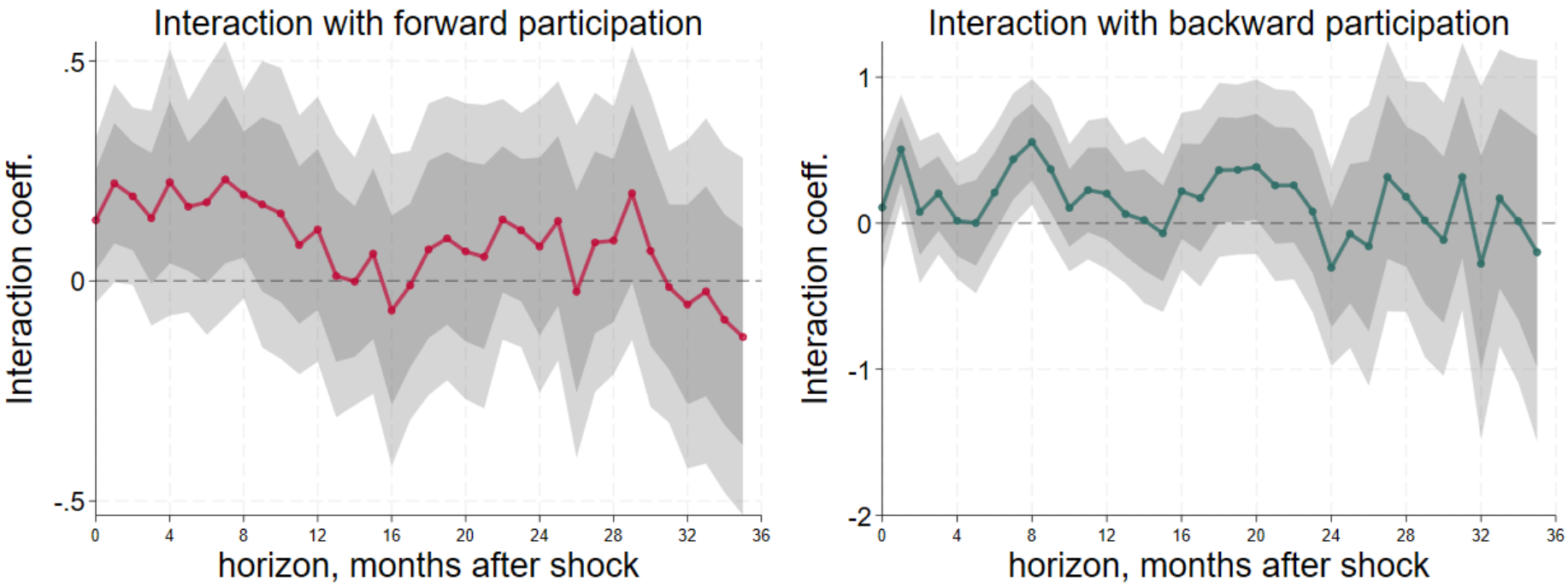


Figure: Jarocinski-Karadi monetary shocks

Interaction coefficients: Fed tightening x US trade exposure – controlling for USD value and oil price paths

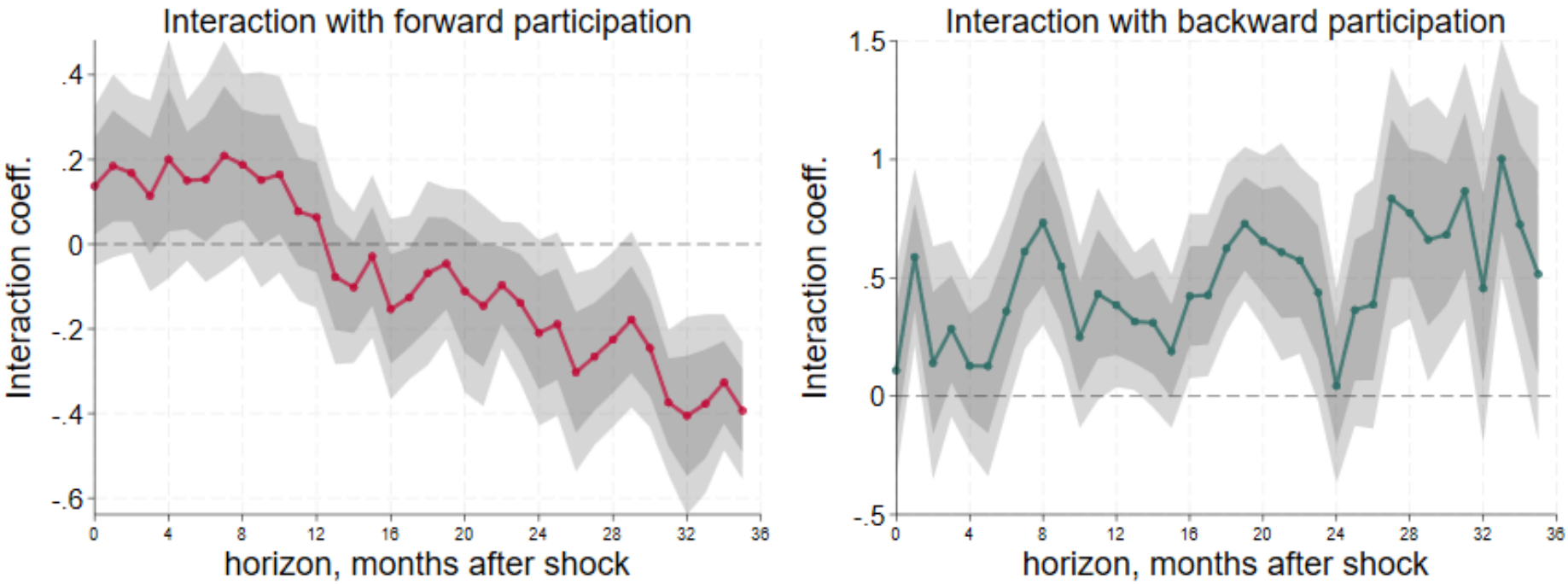


Figure: Jarocinski-Karadi monetary shocks, controlling for USD value & oil

- Opposite sign effects than pos. news about US economy;
- But **weaker and less certain** effect on EA production.

Conclusions

Conclusions

- Fed info shocks extend to real economic effects across the Atlantic – the impact **depends crucially on the trade partner's exposure to the US economy**.
  - Most EA industries benefit from US economic expansion, but the quarter who lose, feel the effect the strongest;
  - EA exporters are more directly affected by higher demanded quantities;
  - EA importers feel the US economic expansion more as a cost-push shock through input price changes;
- Fed monetary shocks take longer to materialise in international macro data and **effects less clearly linked to US trade-exposure**.
  - US monetary tightening affects EA industries more through wider price changes.

More results

Appendix

World IO table

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			Input use & value added							Final use			Total use
			Country 1			⋯	Country J			Country 1	⋯	Country J	
			Industry 1	⋯	Industry S	⋯	Industry 1	⋯	Industry S				
Output supplied	Country 1	Industry 1	Z_{11}^{11}	⋯	Z_{11}^{1S}	⋯	Z_{1J}^{11}	⋯	Z_{1J}^{1S}	F_{11}^{1}	⋯	F_{1J}^{1}	Y_1^1
		⋯	⋯	Z_{11}^{rs}	⋯	⋯	⋯	Z_{1J}^{rs}	⋯	⋯	⋯	⋯	⋯
		Industry S	Z_{11}^{S1}	⋯	Z_{11}^{SS}	⋯	Z_{1J}^{S1}	⋯	Z_{1J}^{SS}	F_{11}^{S}	⋯	F_{1J}^{S}	Y_1^S
	⋯	⋯	⋯	⋯	⋯	Z_{ij}^{rs}	⋯	⋯	⋯	⋯	F_{ij}^{r}	⋯	Y_i^r
	Country J	Industry 1	Z_{J1}^{11}	⋯	Z_{J1}^{1S}	⋯	Z_{JJ}^{11}	⋯	Z_{JJ}^{1S}	F_{J1}^{1}	⋯	F_{JJ}^{1}	Y_J^1
		⋯	⋯	Z_{J1}^{rs}	⋯	⋯	⋯	Z_{JJ}^{rs}	⋯	⋯	⋯	⋯	⋯
		Industry S	Z_{J1}^{S1}	⋯	Z_{J1}^{SS}	⋯	Z_{JJ}^{S1}	⋯	Z_{JJ}^{SS}	F_{J1}^{S}	⋯	F_{JJ}^{S}	Y_J^S
Value added			VA_1^1	⋯	VA_1^S	VA_j^s	VA_J^1	⋯	VA_J^S				
Gross output			Y_1^1	⋯	Y_1^S	Y_j^s	Y_J^1	⋯	Y_J^S	⋯			

Figure: The structure of a world input-output table from Antras & Chor (2022).

from Johnson (2018):

$$Y = F + AY = F + AF + A^2F \dots$$

$$\Rightarrow Y = [\mathbf{I} - \mathbf{A}]^{-1}F$$

Normalise to express VA required to create the amount of final absorption F:

$$VA = \mathbf{VA}^{-1}[\mathbf{I} - \mathbf{A}]^{-1}F$$

A network-based measure of trade exposure to US

Forward participation

- to what extent the industry is a **supplier to the US**

$$FW_{ij}^{r} = \frac{\sum_{s=1}^{S} F_{ij}^{rs}}{VA_{i}^{r}} + \frac{\sum_{k=1}^{K}\sum_{l=1}^{L}\sum_{s=1}^{S} a_{ik}^{rl} F_{kj}^{ls}}{VA_{i}^{r}} + \frac{\sum_{m=1}^{M}\sum_{k=1}^{K}\sum_{l=1}^{L}\sum_{t=1}^{T}\sum_{s=1}^{S} a_{ik}^{rl} a_{km}^{lt} F_{mj}^{ts}}{VA_{i}^{r}} + \ldots$$

with $i = \{\text{country in EA}\}$ and $j = \{\text{US}\}$

Backward participation

- to what extent the industry is **supplied by US**
- i.e. fix $i = \{\text{US}\}$ and $j = \{\text{country in EA}\}$

To compare industries w/ strong one-sided exposure to US (either from imports or exports):

$\Rightarrow$ compute (separate) dummies equal to 1 if the industry is among top-quarter of the distribution of fw- or bw-participating Back

Other variables

Dependent variable: EA industry-level industrial production index

Fed shocks: Jarocinski & Karadi (2020)

Controls:

- Euro stoxx 50 volatility index
- Eonia rate
- Gilchrist-Mojon corporate spreads against the bund
- EA industrial confidence, EA real activity index
- US financial variables: VIX index, 2-year US Treasury yields, Gilchrist-Zakrajsek excess bond premia (robustness)

Channels: Prices: EA import prices (outside EA) + oil & commodity price index;

US foreign demand: US net imports; FX: USD/EUR-rate & USD broader value;

US macro data: US employment & US consumer confidence Back

Additional results

Results 2: Response to US employment or US consumer confidence

US employment and consumer confidence

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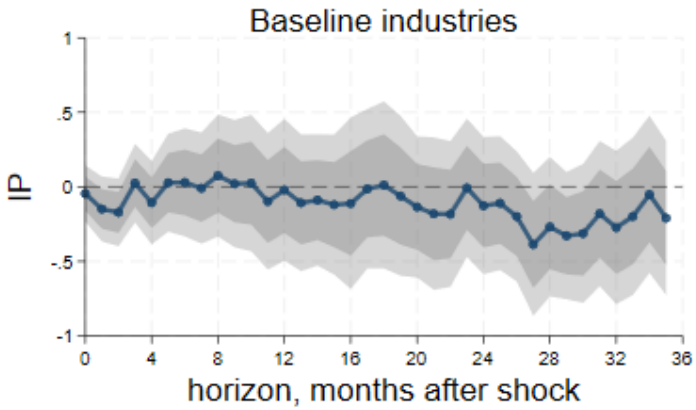

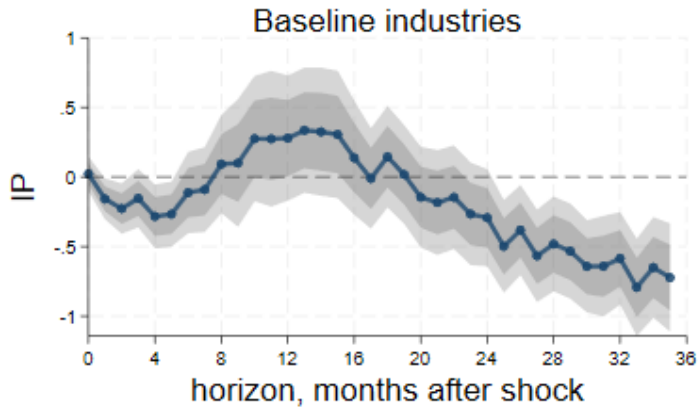

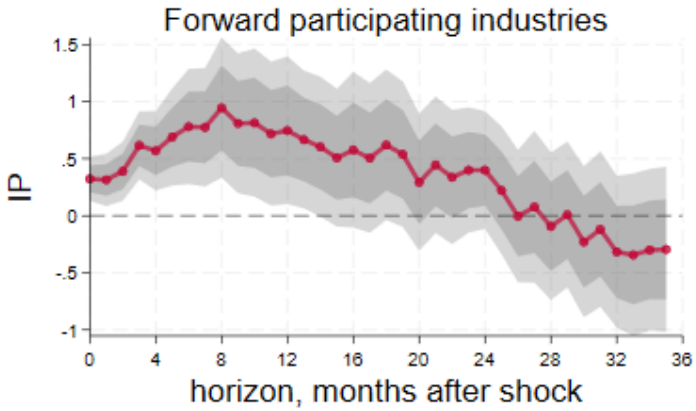

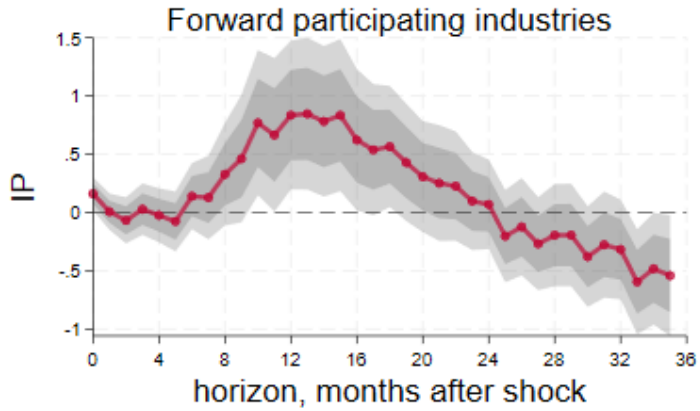

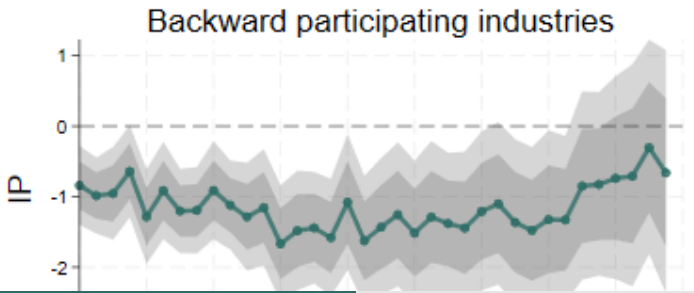

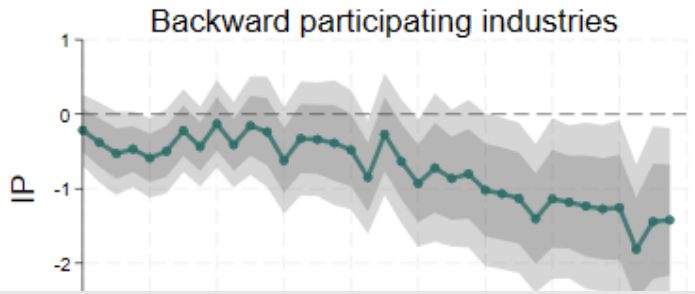

Interactions: US empl. and consumer conf.

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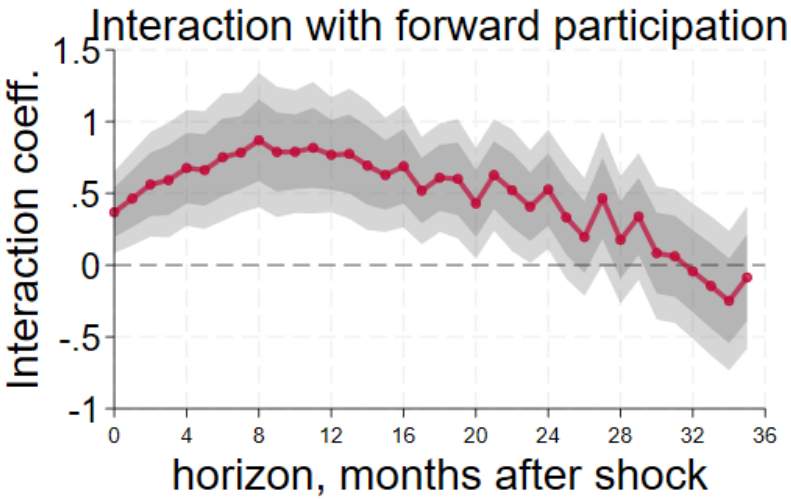
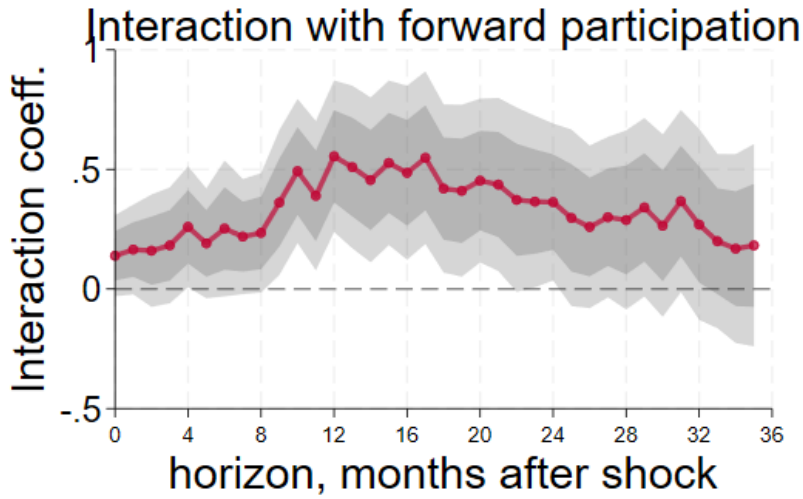
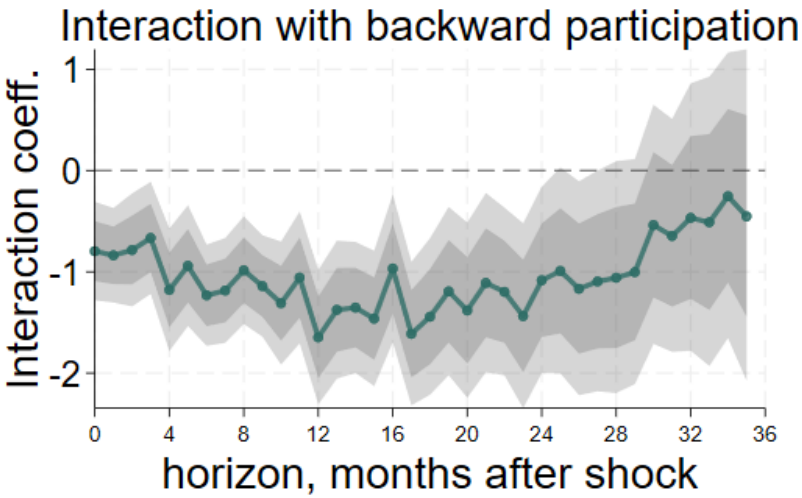






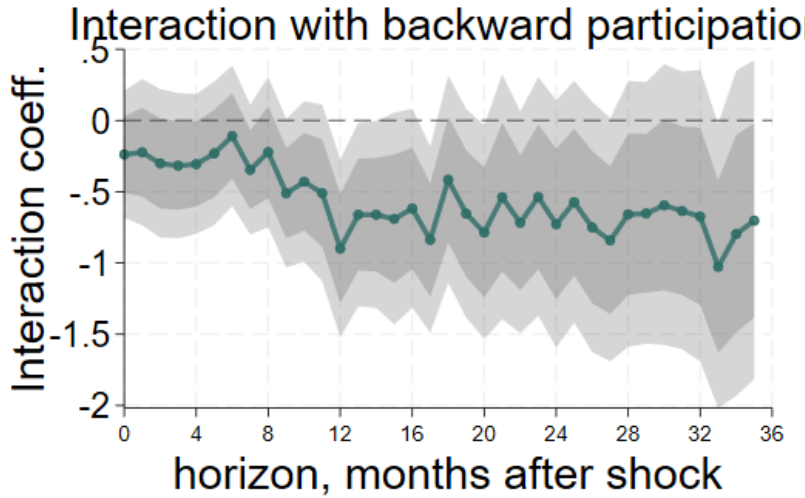
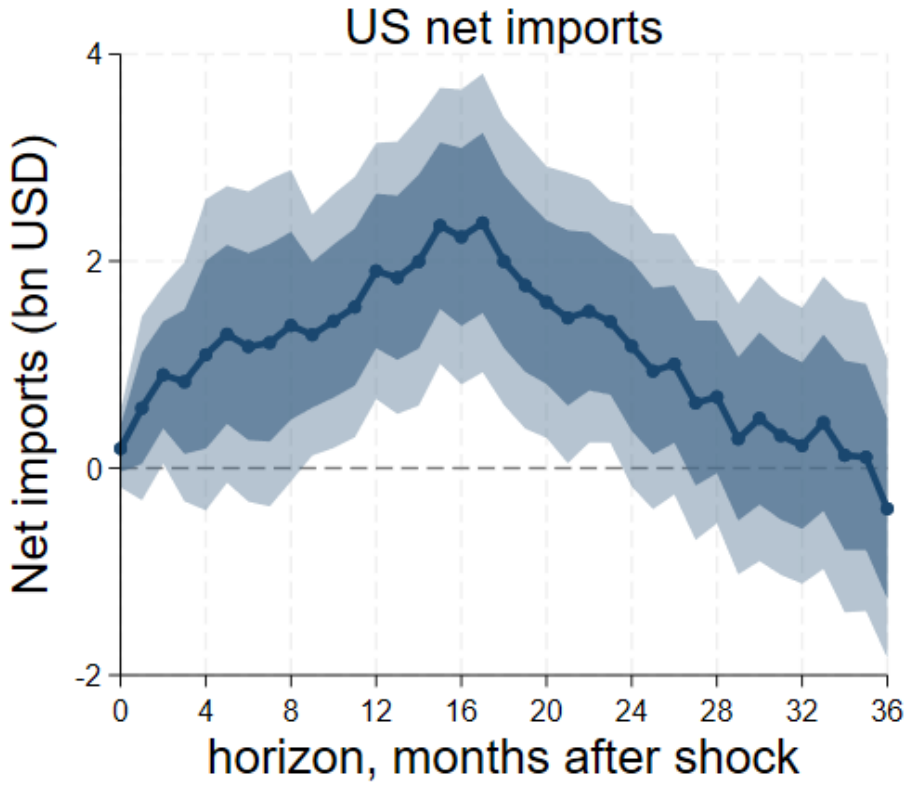


Figure: Effect of changes in US employment

Figure: Effect of changes in US cons. confid.

US net imports



- Impact of 1 st. dev. positive Fed info shock;
- Simple lag-augmented LP of Fed info shock on US net imports Back