Tracking Fragmentation in World Trade

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The views put forward are those of the authors and do not represent the official views of the Banque de France or the Eurosystem.

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Key Message

- Rising concerns that geopolitical tensions will lead to rifts in global trade between countries of opposing geopolitical blocs
- We build an empirical tool to assess the degree of geopolitical fragmentation in global trade, based on a standard gravity equation of trade
- We find evidence in favor of trade fragmentation between geopolitical blocs, following Russia's invasion of Ukraine. Falling trade between geopolitical blocs, and more trade within blocs ("friendshoring")
- Current and future work will look into which countries/products are driving this fragmentation
- Going forward, and depending on demand, the estimates can be regularly updated to provide a tracker of trade fragmentation.

What we do

- We run a standard gravity equation on product-level bilateral international trade data, augmented by dummies for geopolitical alignment
  - Countries are sorted into geopolitical blocs (East, West, Neutral), where bloc affiliation is taken from a recent ECB contribution
  - A flow is characterized as either inter-bloc (East-West), intra-bloc (within East, or within West), or neither (all flows involving neutral countries)
- We estimate this equation quarter-by-quarter, and study the evolution of inter-bloc and intra-bloc trade over time
- Our results indicate that inter-bloc trade has fallen, and intra-bloc trade has grown since Russia's invasion of Ukraine. Both results are *relative* to trade involving neutral countries

Data

Trade Flows

- Quarterly bilateral trade data from Trade Data Monitor (TDM), currently 2017Q1 - 2023Q3, aggregated at the HS4 product level (roughly 1,600 products).
- Data from 55 reporting countries, including all major countries (US, CN, DE, JP, KR, FR, etc.) and 221 partner countries.
- Russia (and Belarus) stopped reporting their flows in early 2022. They are included as partner countries

Political Alignment

- Index of geopolitical alignment by the ECB (den Besten et al, 2023)
- Based on four proxies, for each country:
  1. # was sanctioned by Russia/China - # sanctioned by the US (Global Sanctions Database)
  2. % military imports from Russia and China - % military imports from the US (SIPRI databse)
  3. Whether it participates in the *Belt and Road Initiative* (BRI)
  4. Vote in the United Nations Resolution of March 2, 2022
- Use the index to construct three geopolitical blocs: West (81 countries), East (53), Neutral (95). ▸ Detail

Countries' affiliation

Countries for which we have trade data in blue (**List not complete**).
"Connector" countries (Gopinath et al. 2024; Bloomberg, 2024) are reported in a box.

East	Bangladesh Pakistan	Belarus Russia	China Venezuela	Iran Yemen	Myanmar Zimbabwe
Neutral	Argentina Indonesia Niger South Africa	Brazil Kazakhstan Nigeria Thailand	Chile Malaysia Saudi Arabia Turkey	Colombia Mexico Singapore Uruguay	India Morocco Senegal Viet Nam
West	Australia Czechia Greece Japan Norway Slovakia Taiwan	Austria Denmark Hungary Latvia Poland Slovenia USA	Belgium Finland Ireland Lithuania Portugal Spain Ukraine	Bulgaria France Israel Netherlands Rep. of Korea Sweden United Kingdom	Canada Germany Italy New Zealand Romania Switzerland

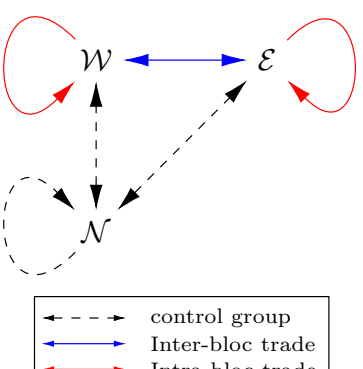
▸ World Map

Interbloc and Intrabloc Trade

We construct dummies that vary at the country-pair level. For an exporter i and an importer j:

$$Interbloc_{ij} = \begin{cases} 1 & \text{if } (i \in \mathcal{W}, j \in \mathcal{E}) \text{ or } (i \in \mathcal{E}, j \in \mathcal{W}) \\ 0 & \text{otherwise} \end{cases}$$

$$Intrabloc_{ij} = \begin{cases} 1 & \text{if } (i,j \in \mathcal{W}) \text{ or } (i,j \in \mathcal{E}) \\ 0 & \text{otherwise} \end{cases}$$



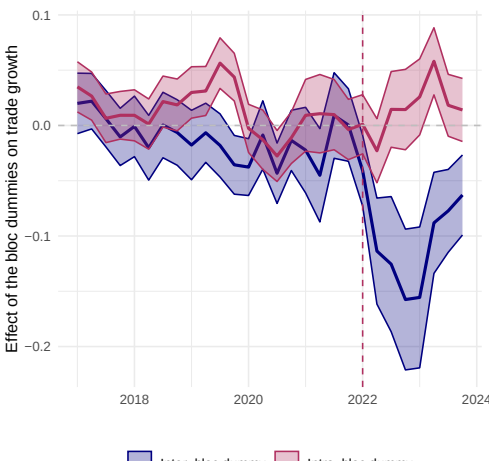
Econometric Specification

$$\Delta \ln Export_{ijkt} = \beta_t Interbloc_{ij} + \alpha_t Intrabloc_{ij} + \gamma_t X_{ij} + FE_{ikt} + FE_{jkt} + u_{ijkt}$$

- i : exporting country
- j : importing country
- k : HS4 product category
- t : quarter
- $\Delta \ln Export$: y-o-y variation in log exports
- X : log distance, contiguity, common language, colonial link, common religion, fta , common legal system, common colonizer

Interbloc VS Intrabloc VS Neutral

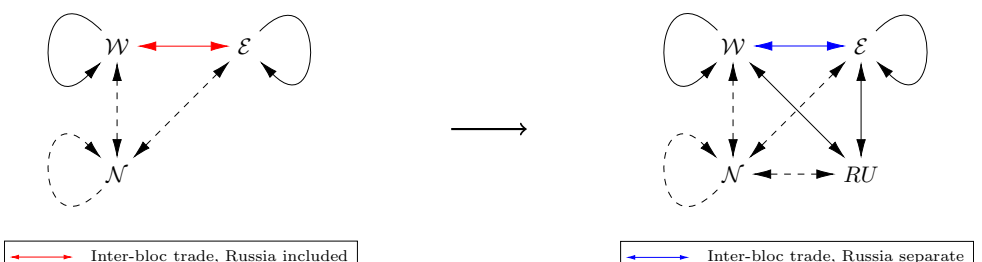
$$\Delta \ln Export_{ijkt} = \beta_t Interbloc_{ij} + \alpha_t Intrabloc_{ij} + \gamma_t X_{ij} + FE_{ikt} + FE_{jkt} + u_{ijkt}$$



- Decline of roughly 10% in inter-bloc trade on average in 2022. But at least partly driven by outright sanctions on trade with RU.
- Do we observe trade fragmentation beyond trade with RU?

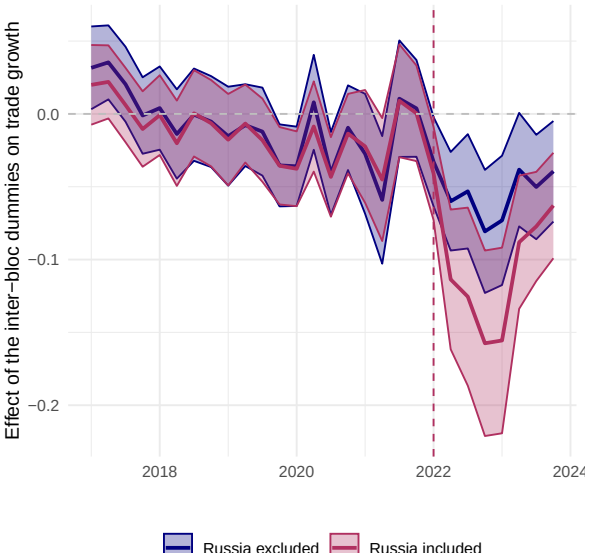
Unpacking Eastern Countries

We re-run the same estimation but considering Russian trade separately from the rest of Eastern Trade.



$$\begin{cases} \Delta \ln Export_{ijkt} = \beta_t Interbloc_{ij} + \alpha_t Intrabloc_{ij} + \quad + \gamma_t X_{ij} + FE_{ikt} + FE_{jkt} + u_{ijkt} \\ \Delta \ln Export_{ijkt} = \beta_t Interbloc_{ij} + \alpha_t Intrabloc_{ij} + \rho_t \mathcal{W}\text{-RU}_{ij} + \eta_t \mathcal{E}\text{-RU}_{ij} + \gamma_t X_{ij} + FE_{ikt} + FE_{jkt} + u_{ijkt} \end{cases}$$

Unpacking Eastern Countries



- Fragmentation is twice smaller when we exclude Russia
- However, there is still a substantial slow down in inter-bloc trade in 2022.

Unpacking Eastern Countries, continued

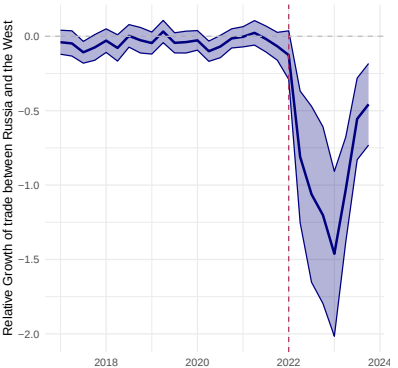


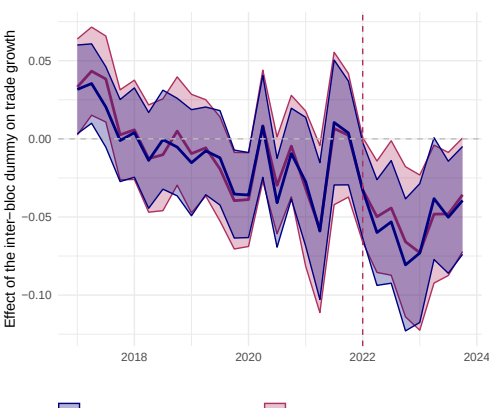
Figure (1) Growth of trade between Russia and the West

Note: The country groups considered in the regression are $\mathcal{W}$, $\mathcal{E}$, $\mathcal{N}$ and Russia. Control group: Trade with Neutral countries.

- Flip side of the previous picture: Trade between West and Russia decreases massively.
- Growth rate reduced by 80p.p in 2023.

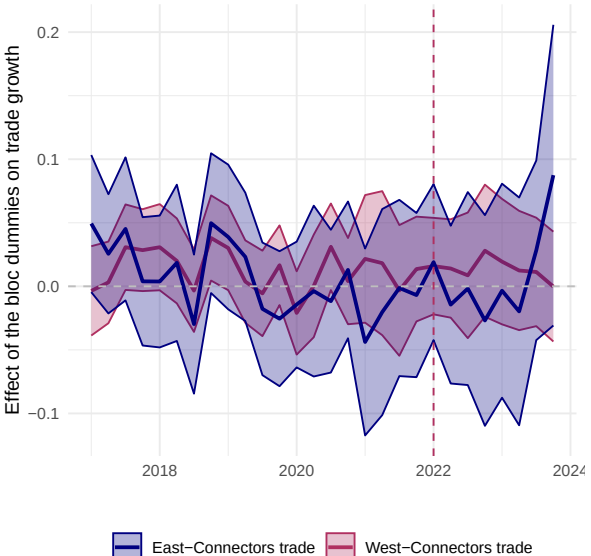
The Role of "Connector" economies

- All the effects so far are relative to trade with Neutral countries
- It might be that the decrease in inter-bloc trade is simply an increase of trade with Neutral countries, via "connector" countries.
- Does trade fragmentation remain if we put connectors as a separate group?



Note: Beside "connectors", the country groups considered in the regression are $\mathcal{W}$, $\mathcal{E}$, $\mathcal{N}$, Russia.
Control group: Trade with Neutral countries.

The Role of "Connector" economies, continued



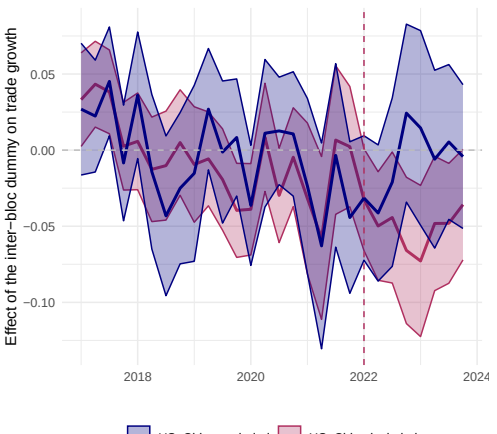
Note: The country groups considered in the regression are $\mathcal{W}$, $\mathcal{E}$, $\mathcal{N}$, Russia and Connectors. Control group: Trade with Neutral countries.

- There is no evidence of trade reallocation towards connectors

The role of US-China Trade

- How much of trade fragmentation is driven by US-China trade wars?

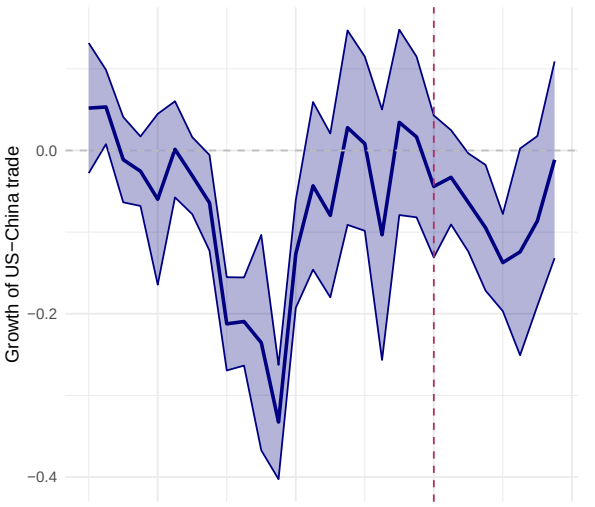
→ we re-estimate, with US and China excluded from the West and East blocs, respectively



Note: Beside the US and China, the country groups considered in the regression are $\mathcal{W}$, $\mathcal{E}$, $\mathcal{N}$, Russia and Connectors. Control group: Trade with Neutral countries.

- Once US and China are excluded from the blocs, post-2022 fragmentation is harder to detect.

The role of US-China Trade, continued

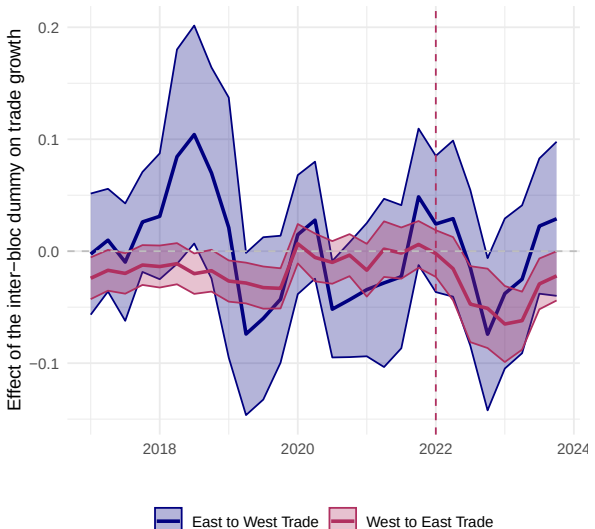


Note: The country groups considered in the regression are $\mathcal{W}$, $\mathcal{E}$, $\mathcal{N}$, Russia, Connectors, US and China. Control group: Trade with Neutral countries.

Directed effects

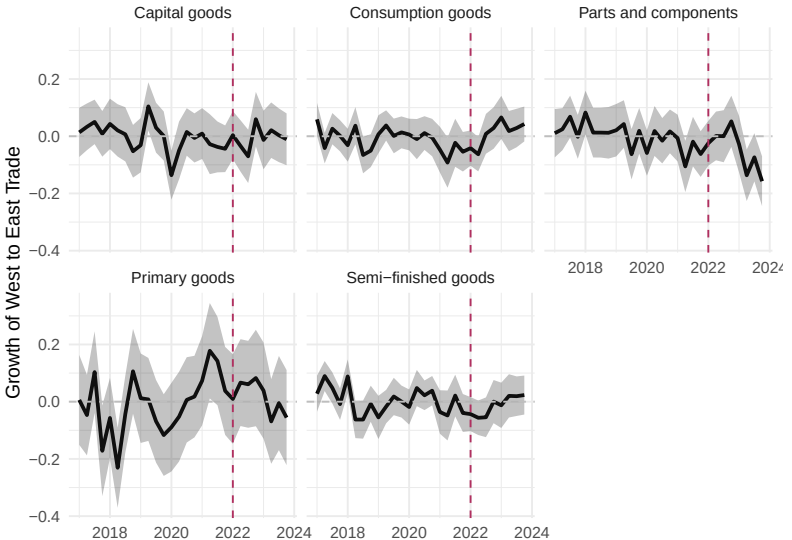
Fragmentation from West to East and from East to West

- So far we have considered undirected effects
- Is fragmentation bi-directional or uni-directional?



Note: The country groups considered in the regression are $\mathcal{W}$, $\mathcal{E}$, $\mathcal{N}$, Russia, Connectors, US and China. Control group: Trade with Neutral countries.

Geofragmentation by Broad Economic Classification



Note: The country groups considered in the regression are $\mathcal{W}$, $\mathcal{E}$, $\mathcal{N}$, Russia, Connectors, US and China. Control group: Trade with Neutral countries.

Next Steps

- Use of Δ log means we only look at intensive margin. Potentially move to PPML to include extensive margin
- Update requires manual data download. Should be automated if demand for frequent updates

Conclusion

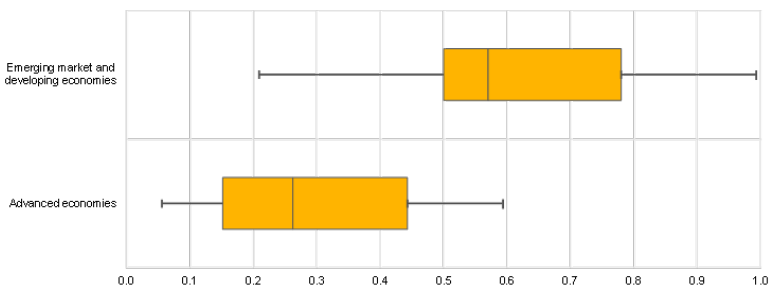
- We develop a "trade fragmentation tracker" – a tool that measures the degree of fragmentation along geopolitical lines in global trade
  - Based on structural gravity equation in international trade
  - Quarterly frequency (but can be done at monthly frequency)
  - Easy to update: Publication lag roughly 3-4 months after the end of a month or quarter
- We find evidence of trade fragmentation following Russia's invasion of Ukraine, and that fragmentation is not entirely driven by outright sanctions on trade with Russia
  - → Roughly 5% decline in inter-bloc trade (excluding Russia)
  - → Notable fall in intermediate goods trade
- Some evidence for friendshoring: Intra-bloc trade grows faster than trade with neutral countries
- Little evidence of indirect trade through connector countries

Appendix: Measuring Fragmentation

We use the index to **construct three geopolitical blocs**:

- West ($\mathcal{W}$): <0.25
- East ($\mathcal{E}$): >0.75
- Neutral ($\mathcal{N}$):between 0.25 and 0.75

- Advanced economies tend to be closer to the US
- EMEs tend to be closer to the China/Russia, with higher dispersion



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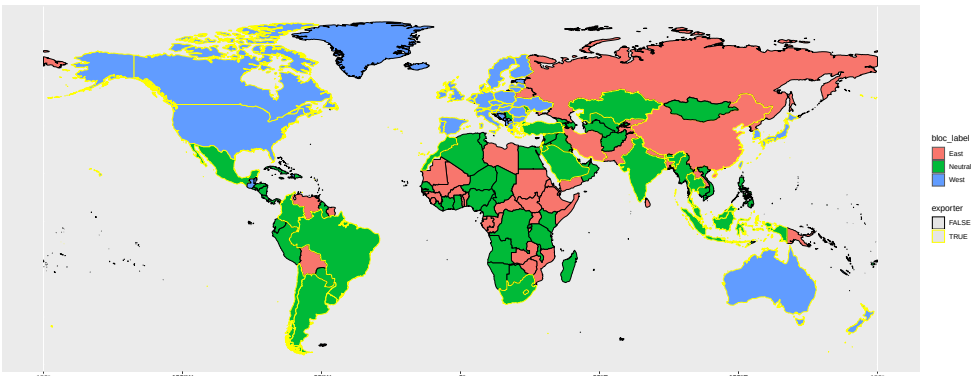
Appendix: Measuring Fragmentation



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