



Divided We Fall: Differential Exposure to Geopolitical Fragmentation in Trade

OCTOBER 24, 2023

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Motivation

Growing concern that the global economy may fracture along geopolitical lines =
“**gloeconomic fragmentation**” (IMF, 2023)

What are the costs of gloeconomic fragmentation in trade? How are they distributed across countries?

This paper makes two contributions:

1. Estimating elasticities of sectoral trade flows to “geopolitical distance”:
 - Closer geopolitical alignment is associated with lower trade barriers
 - Effect concentrated in a few sectors (transport equipment, food/beverages, other manufacturing)
2. Using these elasticities in a quantitative trade model, to discipline trade fragmentation scenarios
 - Long-run impact of fragmentation is larger for EMDEs than AEs
 - Mainly due to their smaller size and greater geopolitical distance from both the U.S. and China

Related Literature

Geoeconomic fragmentation

Cerdeiro et al. (2021); Felbermayr et al. (2022); Goes and Bekkers (2022); IMF (2023); Attinasi et al. (2023); Bolhuis et al. (2023); Campos et al. (2023); Jakubik and Ruta (2023); WEO (April 2023); WEO (October 2023)

Trade and conflict

Pollins (1989a, 1989b); Mansfield and Bronson (1997); Morrow, Siverson, and Taberes (1998, 1999); Mansfield and Pevehouse (2000); Barbieri and Levy (1999); Anderton and Carter (2001); Keshk et al. (2004); Martin et al. (2008); Glick and Taylor (2010)

Gravity Equations and Quantitative Trade Modelling

Anderson and van Wincoop (2003); Anderson and van Wincoop (2004); Arkolakis et al. (2012); Head and Mayer (2014); Costinot and Rodríguez-Clare (2014); Ossa (2015); Caliendo and Parro (2015); Ravikumar et al. (2019); Cuñat and Zymek (2023)

Outline

1. Empirical Estimates of Sensitivity of Trade (Barriers) to Geopolitical Alignment

- Empirical methodology
- Data sources
- Regression results

2. Quantitative Model and Fragmentation Scenarios

- Model description
- Fragmentation scenarios
- Real income effects of trade fragmentation across countries

3. Summary and Conclusions

Empirical Methodology

STEP 1: Estimate (with Poisson Maximum Likelihood):

$$M_{sn'n} = \exp\{\Omega_{sn'} + \Pi_{sn} + \delta_{sn'n}\} \times \zeta_{sn'n},$$

where $M_{sn'n}$ is the value of imports by country n from n' in sector s ; $\Omega_{sn'}$, Π_{sn} , $\delta_{sn'n}$ are dummies.

STEP 2: Estimate (with OLS):

$$-\tilde{\delta}_{sn'n}/\theta_s = \beta_s^0 + \sum_i \beta_s^i x_{n'n}^i + \varepsilon_{sn'n},$$

where θ_s is trade elasticity from the literature, and $\{x_{n'n}^i\}_i$ are country-pair characteristics (such as bilateral distance, contiguous, common language, colonial history, economic treaties: WTO, EU, RTA).

In addition, include a **bilateral measure of geopolitical alignment**.

Data Sources

Sector-level bilateral expenditure flows between 185 economies from the EORA global IO tables (11 broad sectors, 2017-19 average)

Standard gravity controls from CEPII gravity dataset; trade elasticities from Caliendo and Parro (2015)

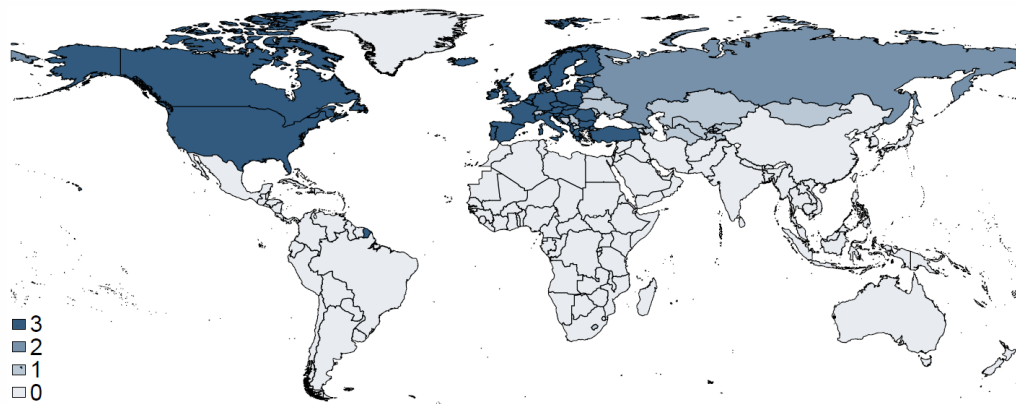
Bilateral geopolitical treaties from Alliance Treaty Obligations and Provisions (ATOP) project

- $treaty_{n'n} = 3$: defense and/or offense obligations
- $treaty_{n'n} = 2$: neutrality and/or consultation obligations (but no defense, offense obligations)
- $treaty_{n'n} = 1$: nonaggression pact (but no defense, offense, neutrality, consult. obligations)
- $treaty_{n'n} = 0$: no alliance obligation

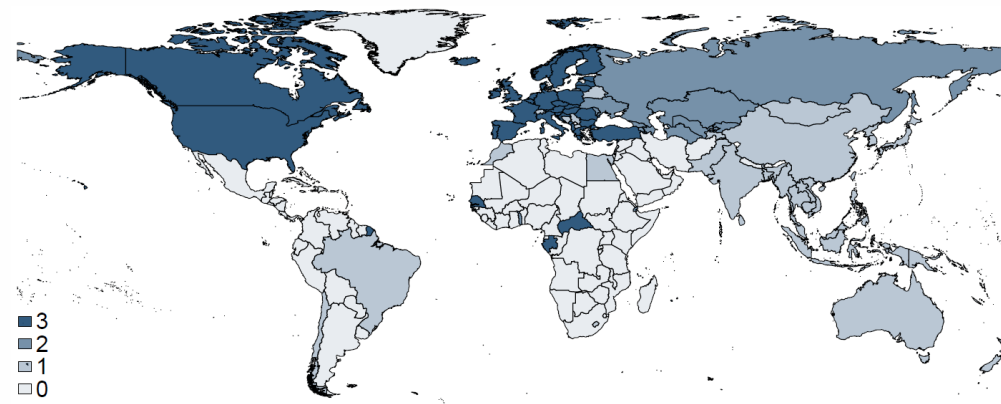
Bilateral geopolitical alignment computed based on similarity of countries' geopolitical treaty portfolios: values from 1 (most aligned; identical treaty obligations) to -1 (least aligned: opposing treaty obligations).

Countries with Similar Alliance Portfolios

Germany's alliance portfolio



France's alliance portfolio

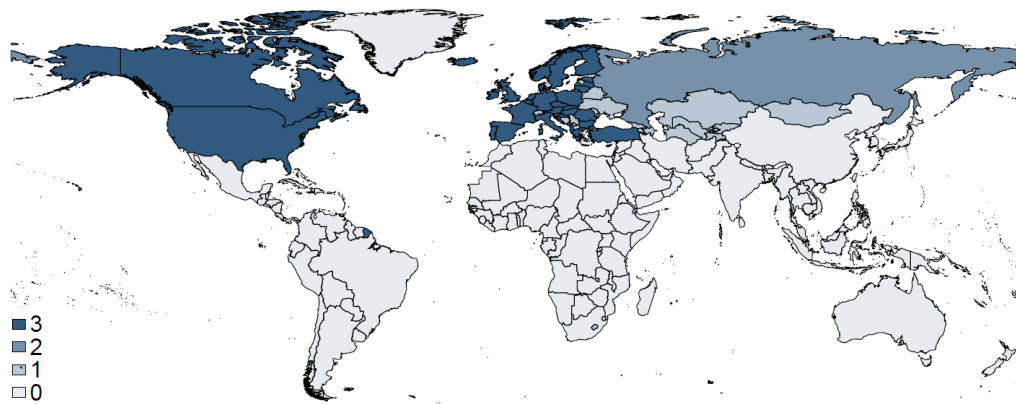


$$\text{Alignment score: } u_{n'n}^{align} = .85$$

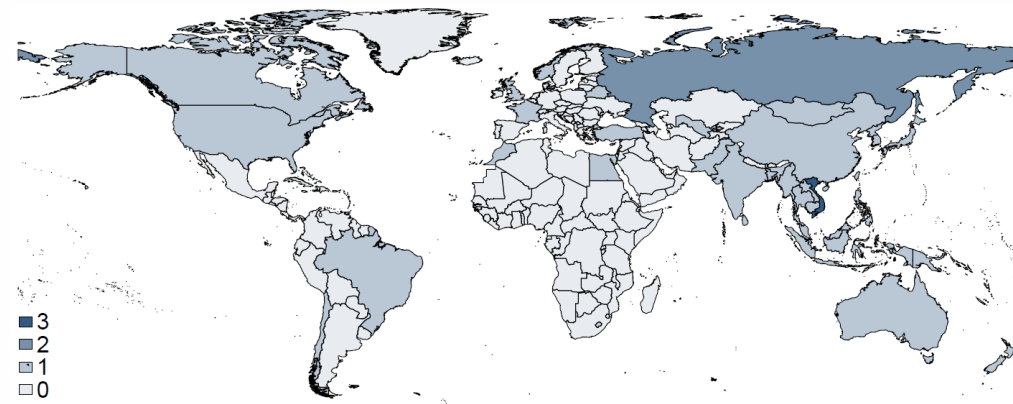
Sources: ATOP, and IMF staff calculations.

Countries with Dissimilar Alliance Portfolios

Germany's alliance portfolio



Vietnam's alliance portfolio

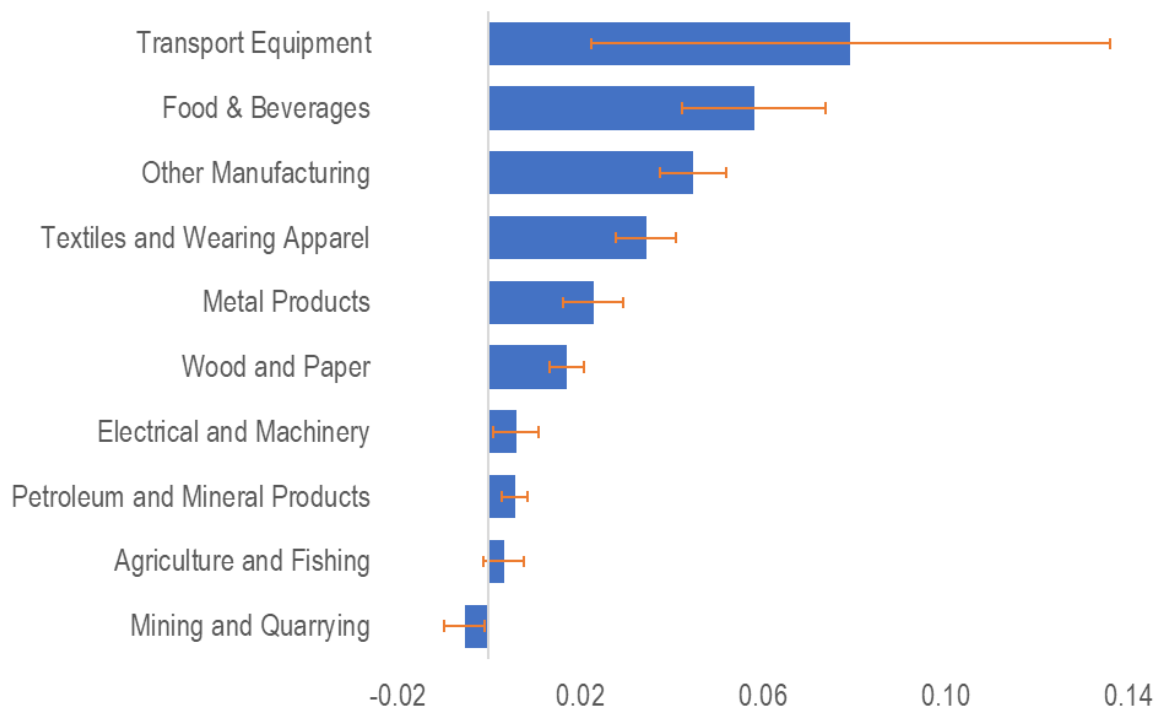


$$\text{Alignment score: } u_{n'n}^{align} = .50$$

Sources: ATOP, and IMF staff calculations.

Baseline Regression Results (1/2)

Estimated Impact on Trade Barriers of One Standard Deviation Decrease in Geopolitical Alignment



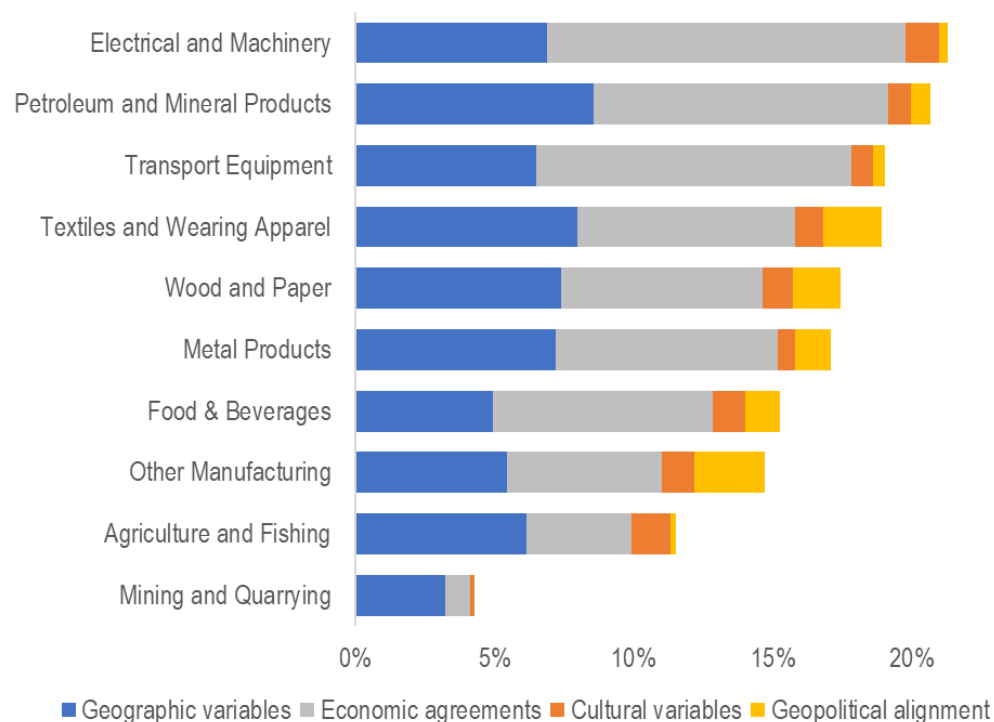
Note: Controlling for importer and exporter effects, distance, contiguity, common language, colonial history, WTO membership, RTA membership, EU membership.
Source: IMF staff calculations.

- Largest effect in **transport equipment** (0.08 log points \approx 8 percent); followed by food and beverages, and other manufacturing
- **Interpretation:** restrictions on trade in sensitive goods + higher uncertainty/lower trust trading across geopolitical divides
- **After** controlling for economic agreements!
- **Robust** to variations in sample, time period, etc.

Baseline Regression Results (2/2)

Relative Importance of Different Trade-Cost Drivers Across Sectors

(Percent of variance explained)



Note: Geographic variables: distance, contiguity; economic agreements: WTO membership, RTA membership, EU membership; cultural variables: common language, colonial history.

Source: IMF staff calculations.

- Differences in geopolitical alignment currently only account for a small share of variation in bilateral trade barriers across countries
- The quantitative importance of geopolitics is comparable with cultural variables...
- ...but less important than geography and trade agreements

Quantitative Model and Fragmentation Scenarios

We use the dynamic quantitative trade model from Cuñat and Zymek (2023):

- economies differ in their productivity in/reliance on many sectors → trade between sectors;
- goods are differentiated by origin → trade within sectors, sector-level “gravity equations”;
- agents make consumption, savings and investment decisions and can borrow/lend internationally.

Delivers **steady-state** trade patterns, per-capita capital stocks and real-incomes for given trade barriers.

Baseline fragmentation scenario:

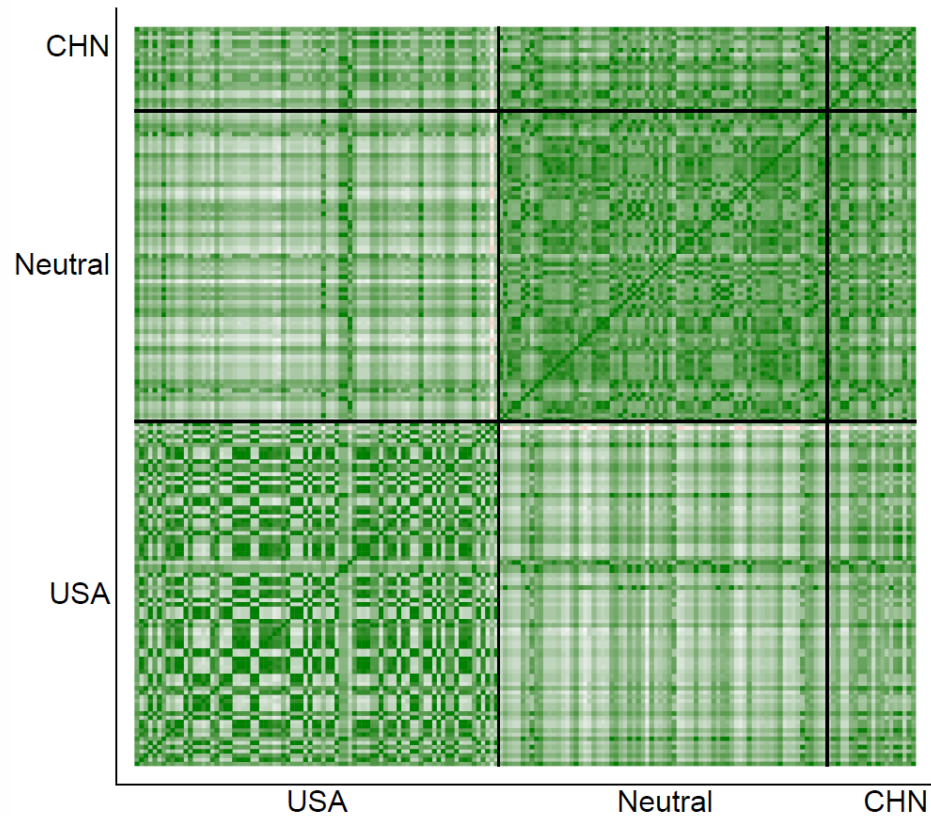
1. “Geopolitical polarization”:

Countries’ alignments rise within each of a U.S., China and Non-aligned “bloc”, but decline across.

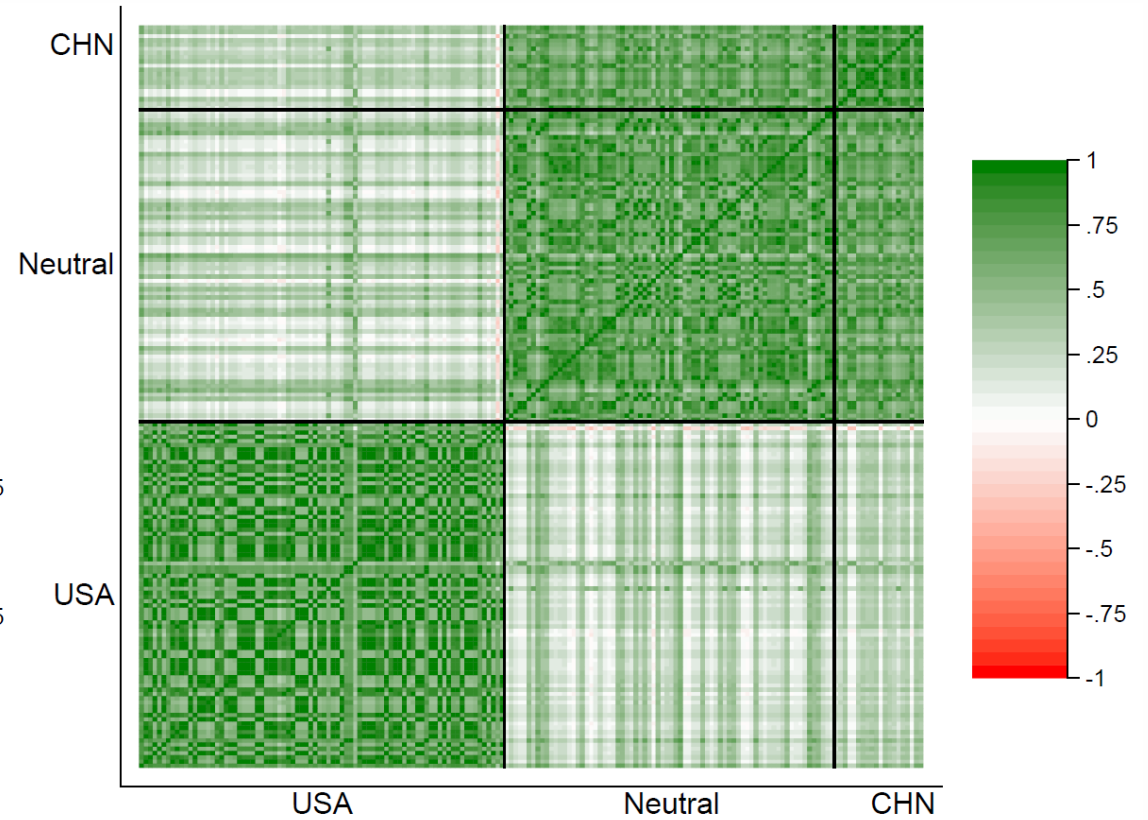
2. Increased sensitivity of trade to geopolitics:

Elasticity of trade (barriers) to geopolitical alignment rises proportionally (doubles) in each sector.

Geopolitical Polarization: Scenario



Bilateral alignment in 2018



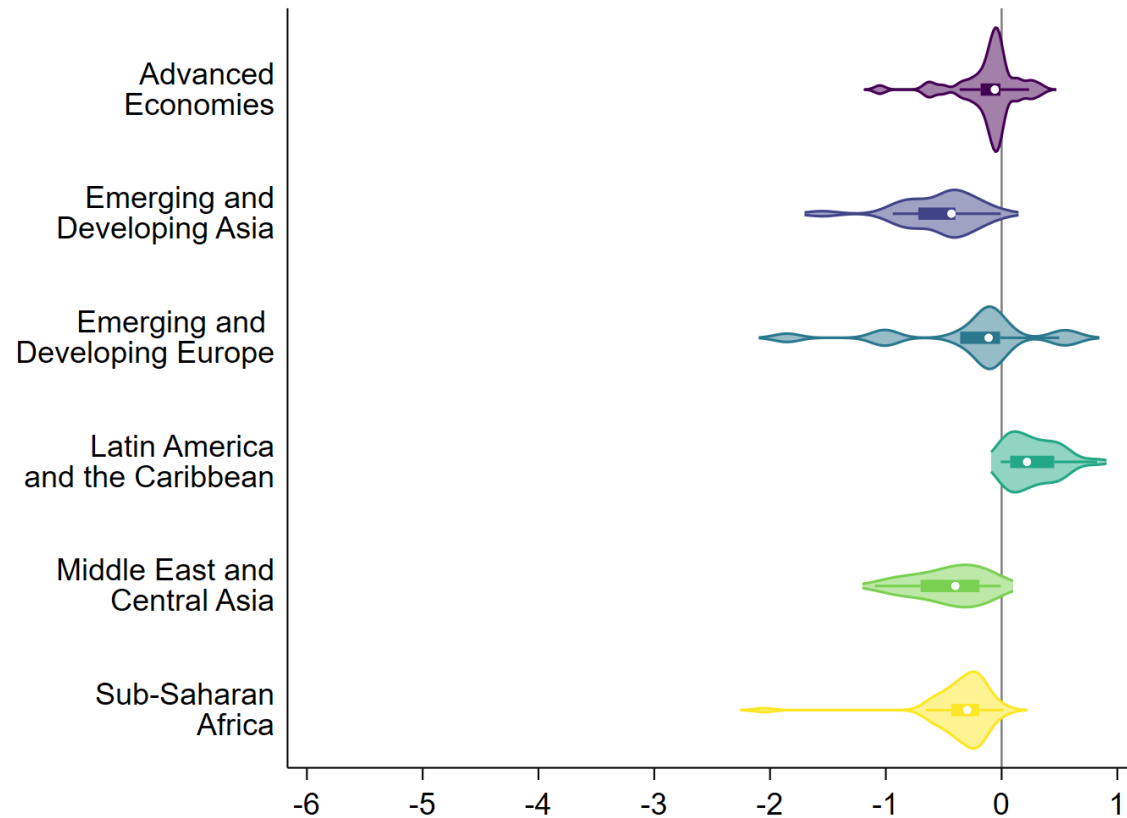
Counterfactual alignment

Note: Countries are allocated to blocs based on their 2018 geopolitical treaty strength vis-à-vis the U.S. relative to China. “USA”: stronger geopolitical treaties with the U.S. than with China; “CHN”: stronger geopolitical treaties with China than with the U.S.; “Neutral”: equal strength with both.

Source: ATOP and IMF staff calculations.

Geopolitical Polarization: Impacts

Change in steady-state real income per capita (Percent)

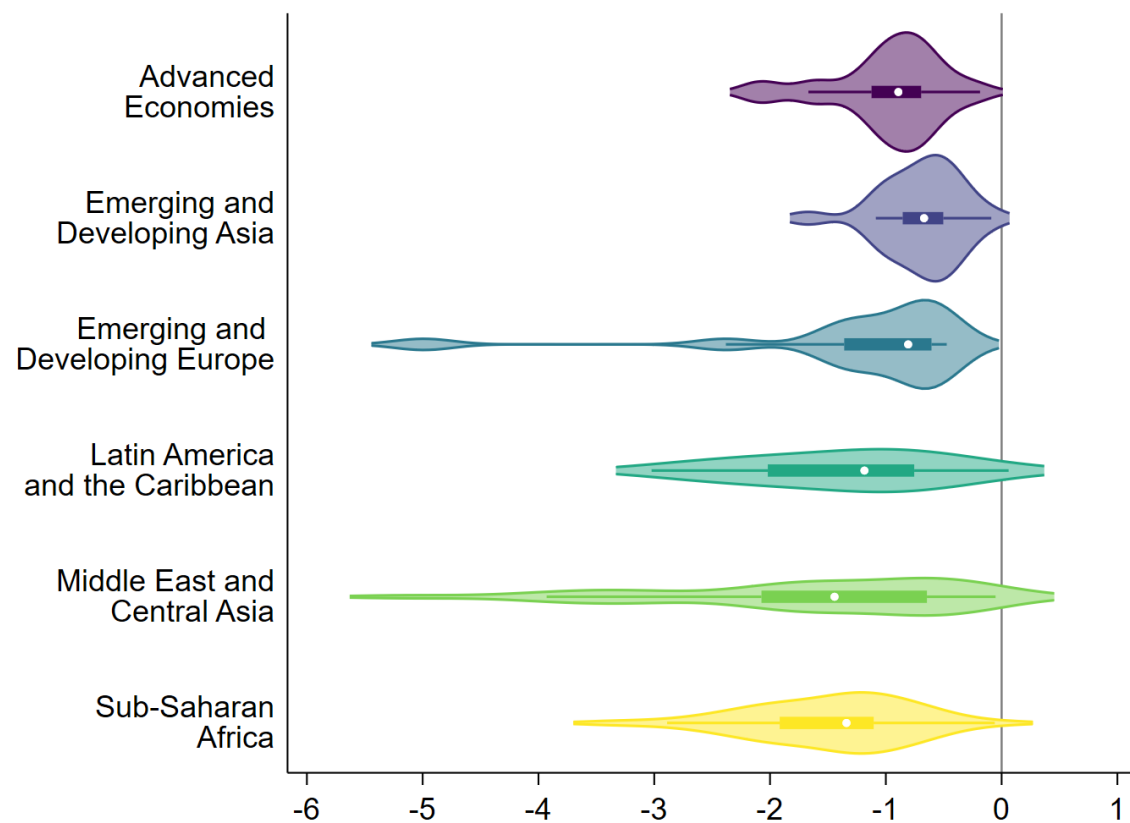


Note: Excludes outside values.
Source: IMF staff calculations.

- **Small losses overall:** median economy steady-state real income per capita declines by 0.2 percent.
- **Some economies gain:** reduction in trade barriers within blocs outweigh increases between blocs (e.g., Latin America and Caribbean).

Increased Geopolitical Sensitivity: Impacts

Change in steady-state real income per capita (Percent)

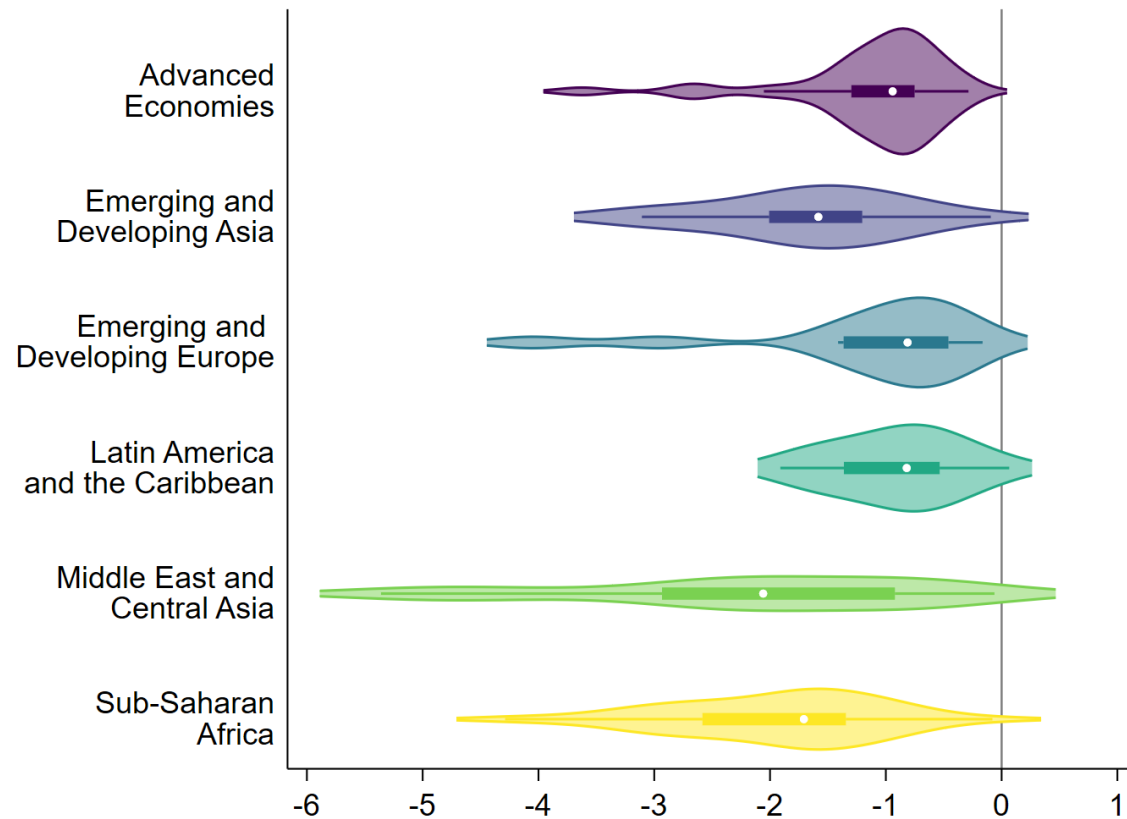


Note: Excludes outside values.
Source: IMF staff calculations.

- **Larger overall losses:** median economy steady-state real income per capita declines by 1 percent.
- **Almost all economies lose:** due to more uniform rise in trade barriers.
- Median income losses for different regions range from 0.7 percent to 1.5 percent.

Polarization + Increased Sensitivity: Impacts

Change in steady-state real income per capita
(Percent)



Note: Excludes outside values.
Source: IMF staff calculations.

- **Largest overall losses:** median economy steady-state real income per capita declines by 1.4 percent.
- Advanced Economies lose least.
- Median income losses in Middle East and Central Asia, and Sub-Saharan Africa are more than twice as large as for Advanced Economies.
- One quarter of economies in these regions see losses > 3 percent.

Sources of Heterogeneity in Income Effects

Share of Variation in Baseline Income Effects Captured by “Partial” Fragmentation Counterfactuals

(Approximate percent of variance explained)

Size		51
Import composition		10
Geopolitical positioning	-Initial alignments	22
	-Alignment changes	14

“Size” counterfactual: uniform increase in trade barriers across country pairs. “Import composition” counterfactual: increased trade sensitivity to geopolitics, assuming same bilateral alignment across all country pairs and no change in average trade barriers. “Initial alignments” counterfactual: increased trade sensitivity to geopolitics, assuming same initial sensitivity across sectors and no change in average trade barriers. “Alignment changes” counterfactual: geoeconomic polarization, assuming same initial sensitivity across sectors and no change in average trade barriers.

- **Economy size** explains about half of the differences in exposure to geoeconomic fragmentation
- **Geopolitical positioning** (current alignment + alignment change) is the second-most important factor.
- Differences in composition of import baskets is third.
- **New trade agreements or strategic bloc membership** only partially offset the economic losses of “neutral” EMDEs.

Summary and Conclusion

We provide empirical evidence that can be used to discipline geoeconomic fragmentation scenarios:

- Current role of geopolitical alignment in sector-level trade patterns;
- Relative importance of geopolitics compared with other trade drivers.

Introducing this into a quantitative trade model, we show that

- Poor countries stand to lose disproportionately from geoeconomic fragmentation;
- Losses of “neutral” EMDEs are only partially offset by new trade/geopolitical treaties.

Policy implications

1. Avoid geoeconomic fragmentation if possible!
2. Compensate by intensifying bilateral/regional trade liberalization efforts (e.g., AfCFTA).
3. Anticipate growth headwinds from fragmentation: re-double domestic pro-growth efforts.