



Divided We Fall: Differential Exposure to Geopolitical Fragmentation in Trade

JANUARY 5, 2024

Shushanik Hakobyan (IMF)

Sergii Meleshchuk (IMF)

Robert Zymek (IMF and CESifo)

The views expressed are those of the authors and do not necessarily reflect the views of the IMF, its management or Executive Board.

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)

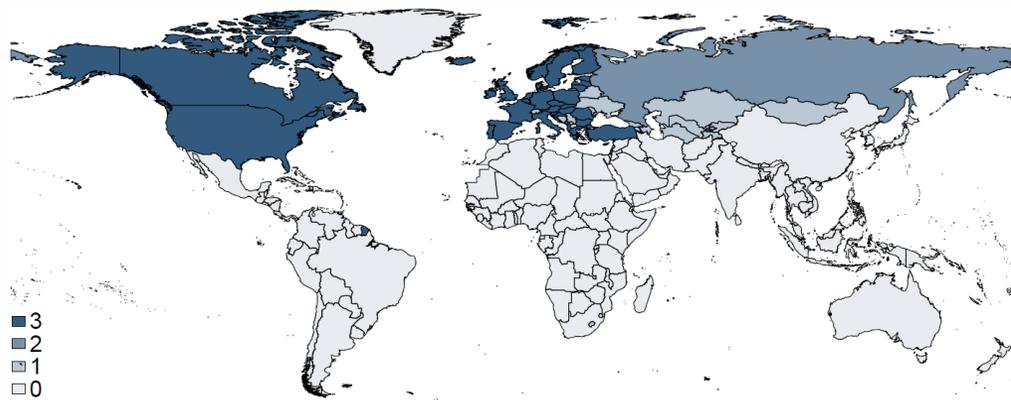
Bilateral geopolitical treaties from Alliance Treaty Obligations and Provisions (ATOP) project

- $treaty_{n'n} = 3$: 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

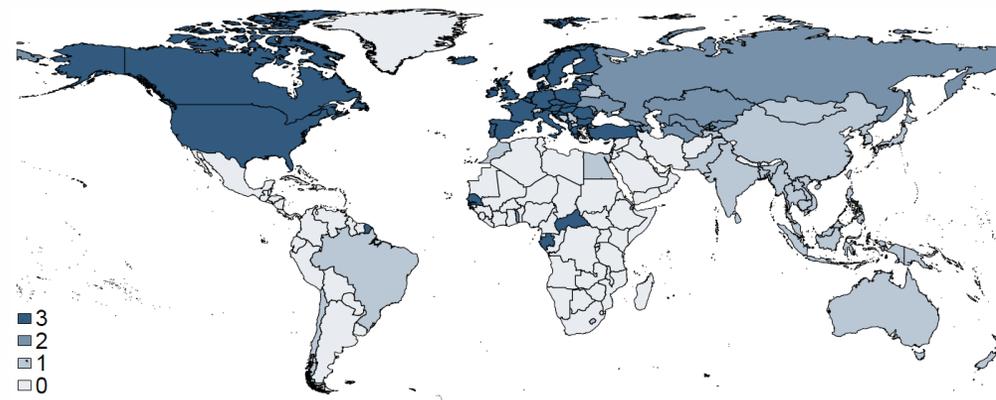
Bilateral geopolitical alignment computed based on similarity of countries' geopolitical treaty portfolios: values from 1 (most aligned; identical treaty obligations) to -1 (least aligned: opposing treaty obligations).

Countries with Similar Alliance Portfolios

Germany's alliance portfolio



France's alliance portfolio

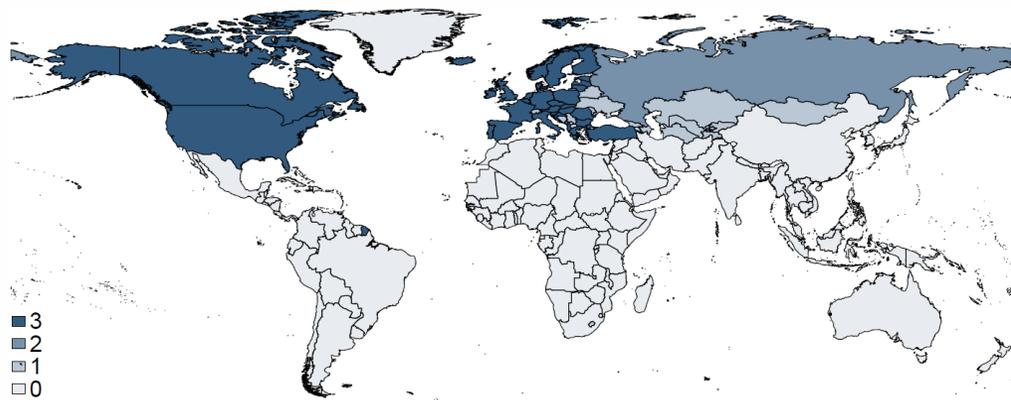


$$\text{Alignment score: } u_{n'n}^{align} = 0.85$$

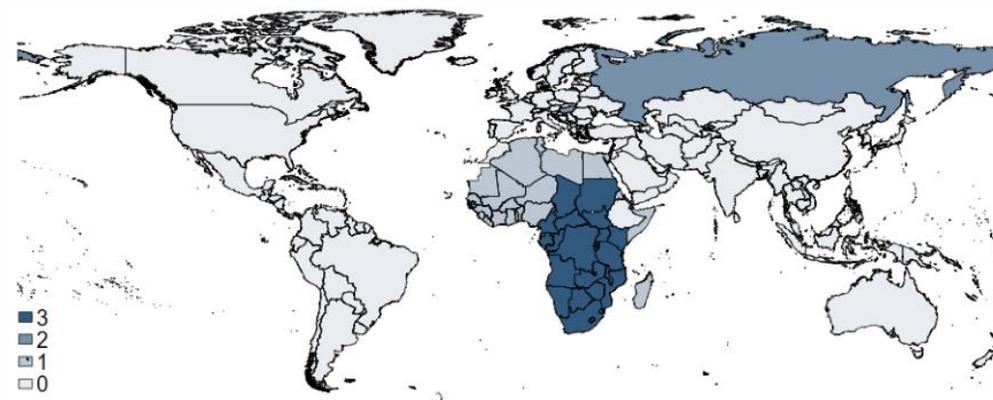
Sources: ATOP, and IMF staff calculations.

Countries with Dissimilar Alliance Portfolios

Germany's alliance portfolio



Angola's alliance portfolio

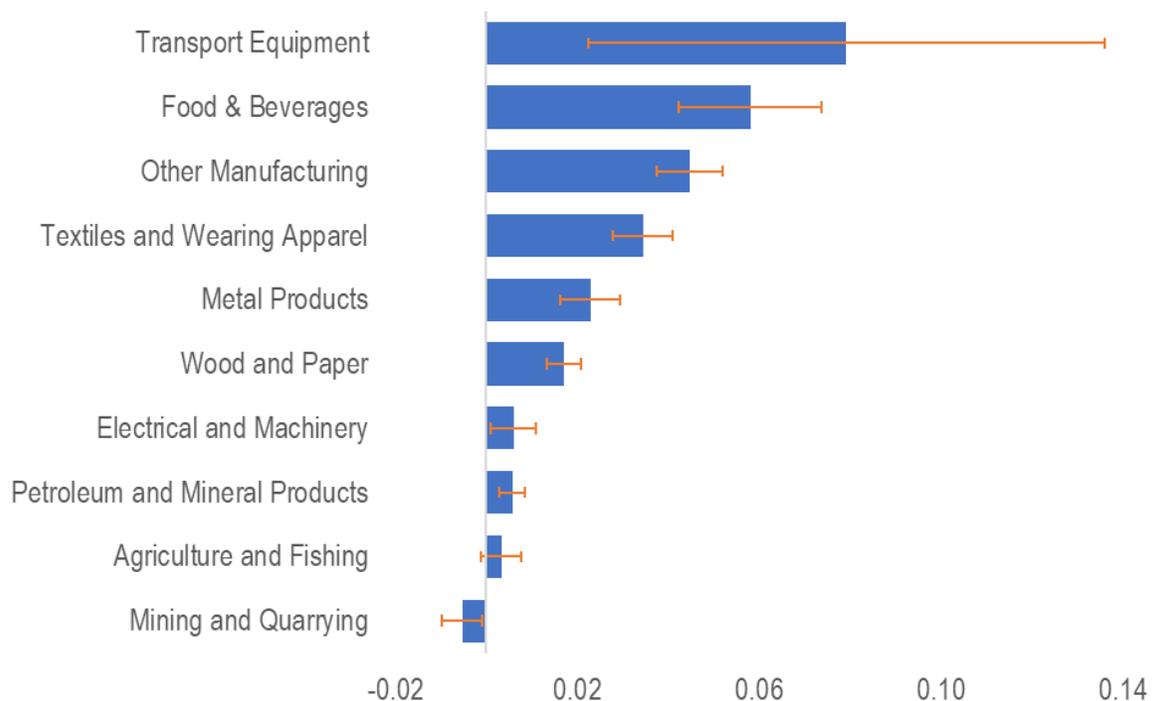


$$\text{Alignment score: } u_{n'n}^{align} = 0.21$$

Sources: ATOP, and IMF staff calculations.

Baseline Regression Results (1/2)

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



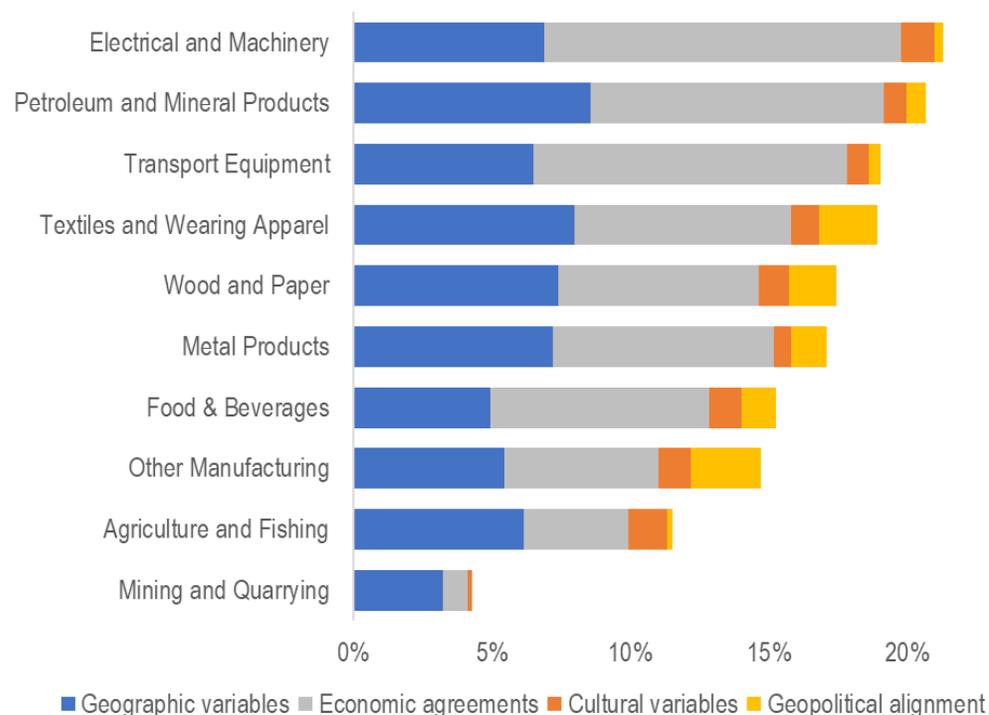
Note: Controlling for importer and exporter effects, distance, contiguity, common language, colonial history, WTO membership, RTA membership, EU membership.
Source: IMF staff calculations.

- 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:

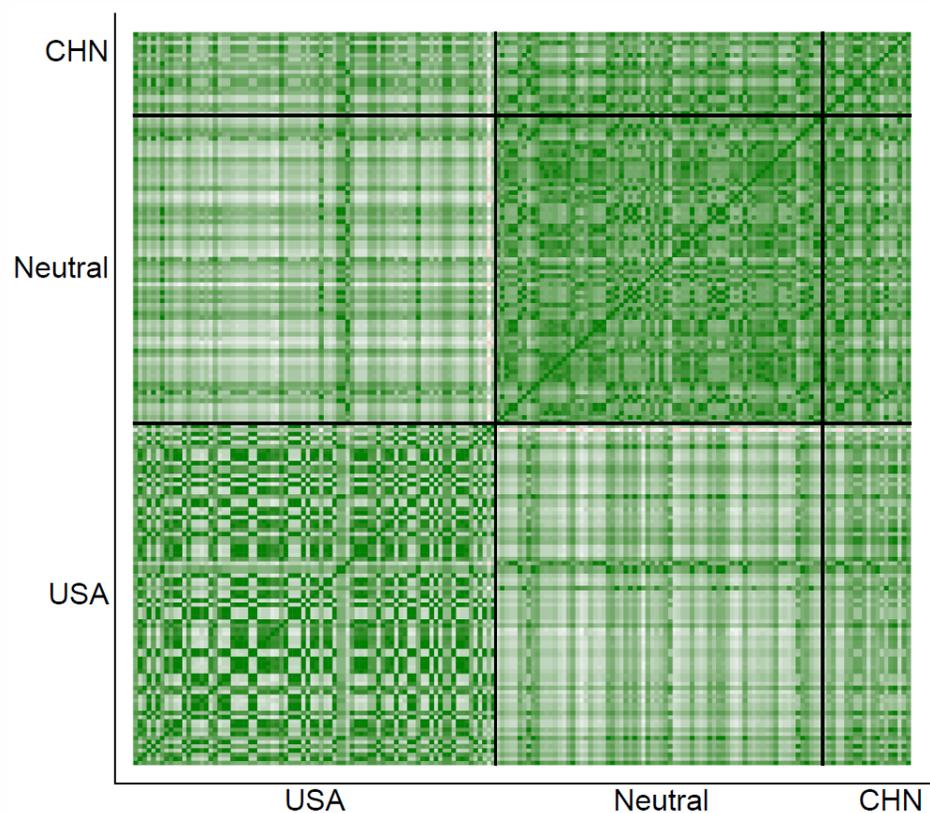
1. “Geopolitical polarization”:

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

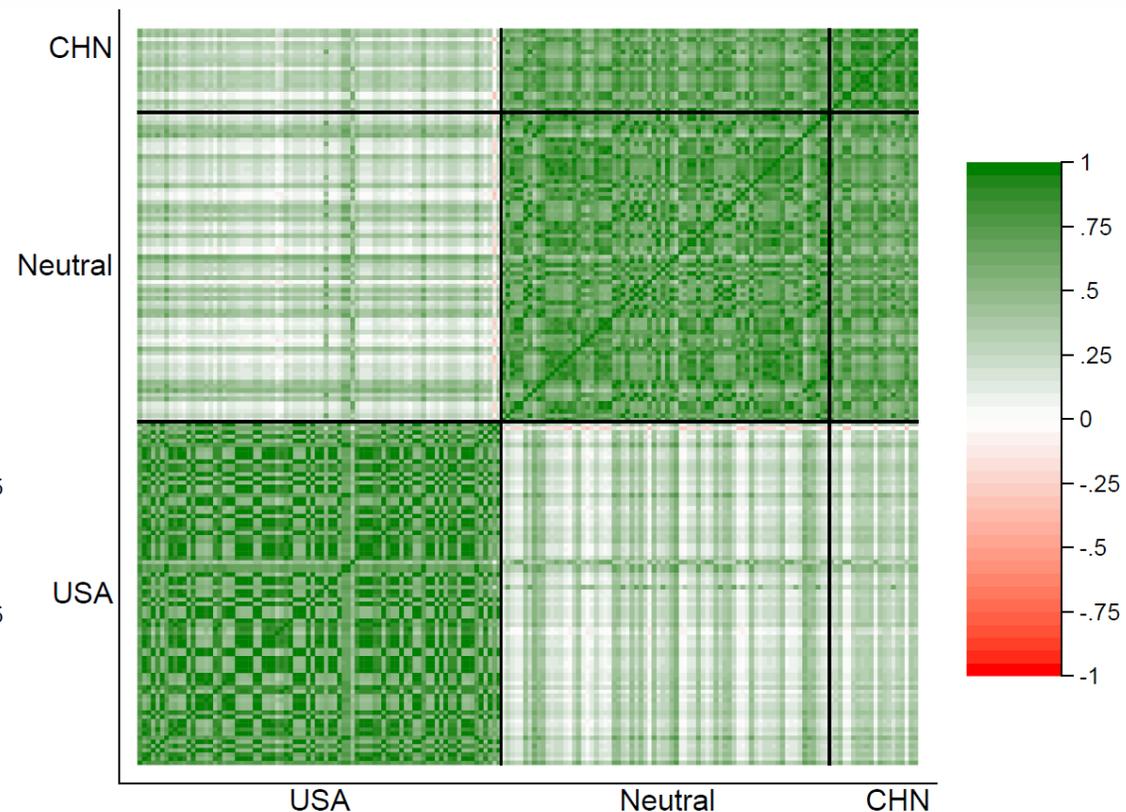
2. Increased sensitivity of trade to geopolitics:

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

Geopolitical Polarization: Scenario



Bilateral alignment in 2018



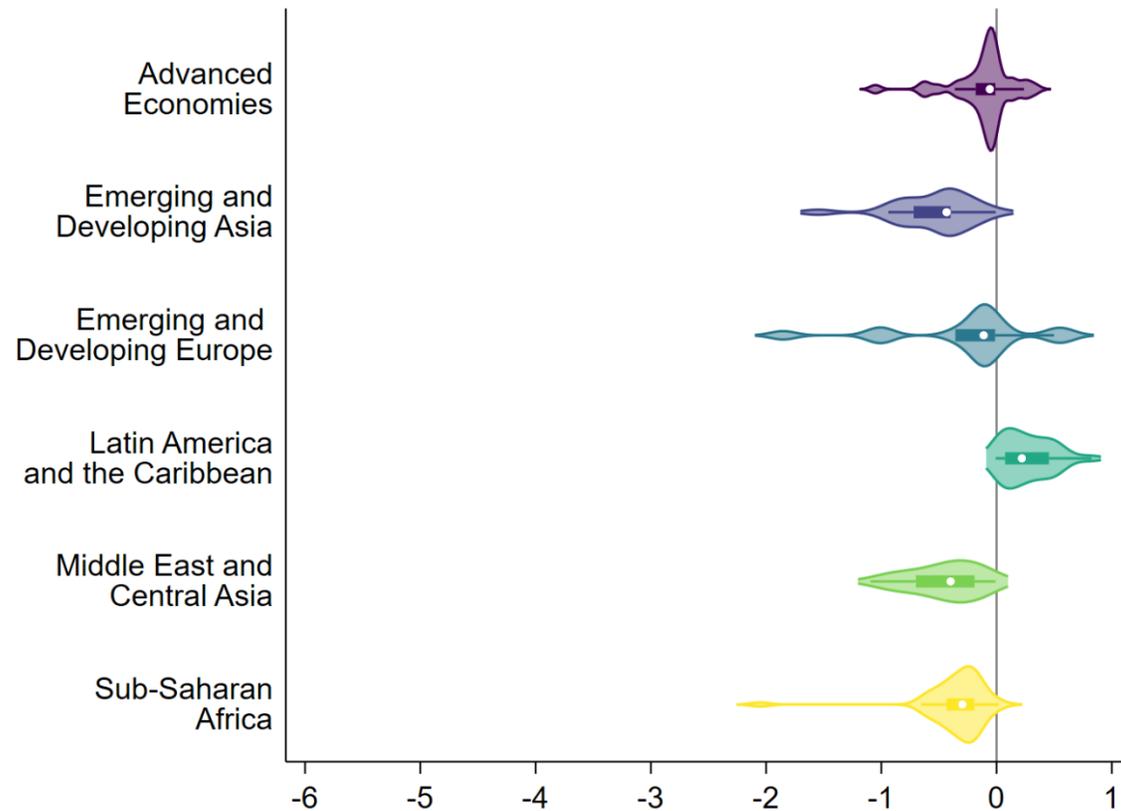
Counterfactual alignment

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)

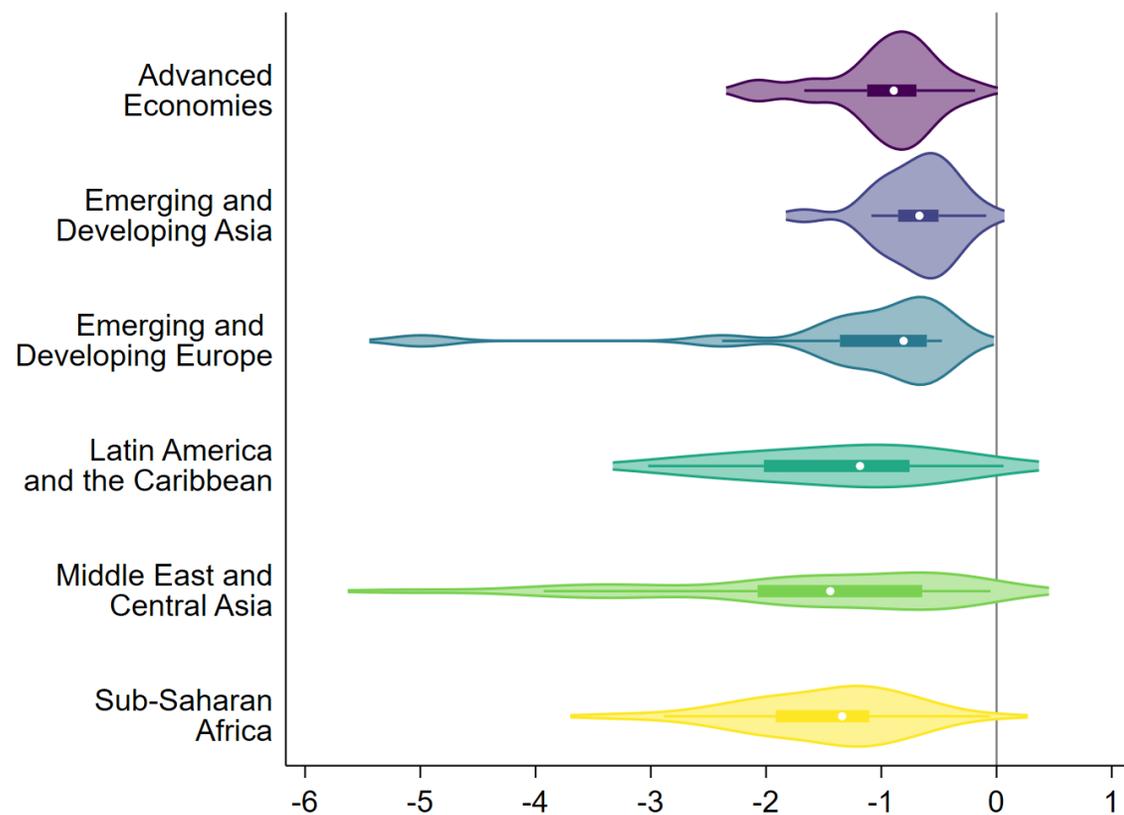


Note: Excludes outside values.
Source: IMF staff calculations.

- **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)

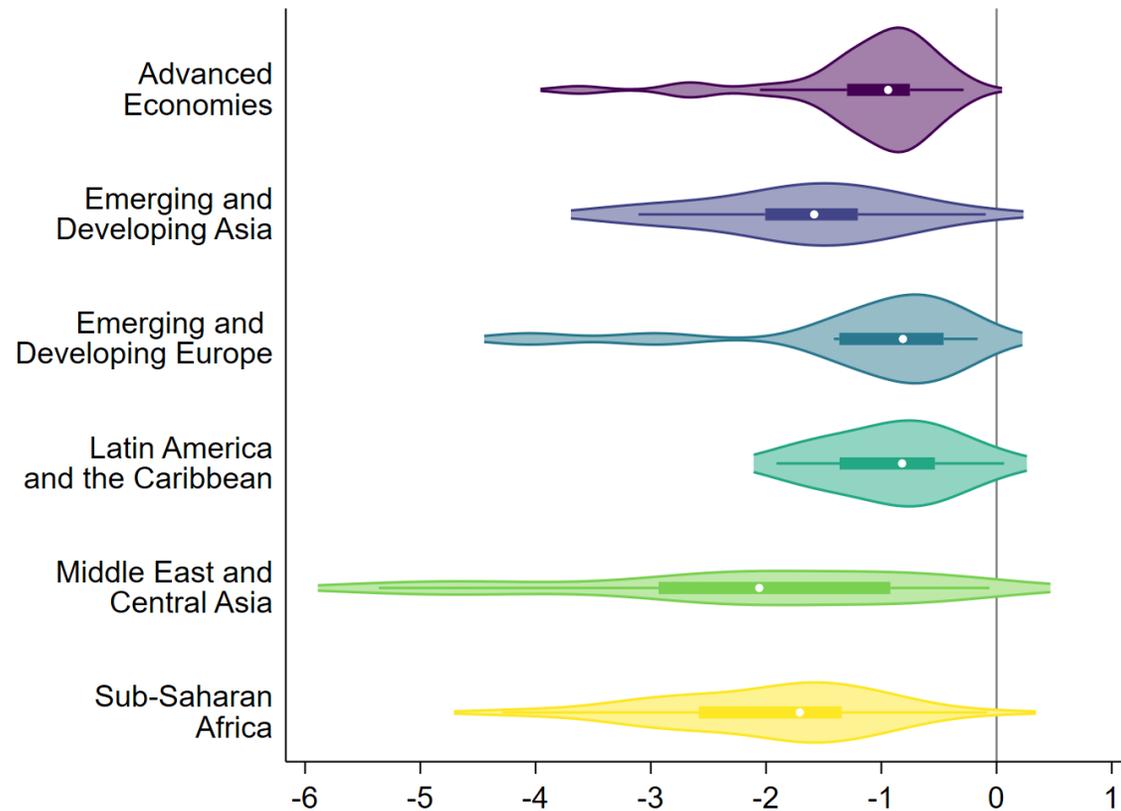


Note: Excludes outside values.
Source: IMF staff calculations.

- **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.