Geoeconomic fragmentation and the role of non-aligned countries*

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Abstract

We analyze how non-aligned countries affect welfare outcomes in scenarios of global trade fragmentation. Using a quantitative trade model covering 141 countries and 65 economic sectors, we simulate different scenarios of geoeconomic fragmentation. We find that major non-aligned countries benefit from their neutral position, with welfare gains of up to 0.7%. Their manufacturing sectors particularly benefit under incomplete fragmentation, experiencing value added gains of 2.5%, while agriculture and services face modest declines. These gains turn into significant losses if they join either the Western or Eastern trade bloc. Moreover, world welfare losses increase from -1.9% under incomplete fragmentation to -2.7% when non-aligned countries join the West and to -3.7% when they join the East. Our results highlight the strategic importance of non-aligned countries in mitigating the negative effects of global trade fragmentation.

Keywords: Trade policy, gains from trade, global value chains, quantitative trade models, general equilibrium

JEL Classification: F11, F13, F15, F17, F51

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1 Introduction

The global trading system faces increasing pressure from geopolitical tensions and growing economic nationalism. Major economies are increasingly prioritizing domestic production and geopolitical considerations over economic efficiency, leading to concerns about the fragmentation of the world economy into distinct trading blocs. This shift has sparked warnings from international institutions about the risks of geoeconomic fragmentation and policy-driven de-globalization (Aiyar et al., 2023; World Trade Organization, 2023; Attinasi et al., 2024b).

In this evolving landscape, a group of countries that abstained from choosing sides in recent geopolitical tensions has emerged as particularly important. Following Gopinath et al. (2024), we refer to these non-aligned countries as 'connector' countries due to their unique position in maintaining substantial economic ties with both Western and Eastern blocs. This group – including significant players like India, Brazil, and Mexico – could potentially mitigate or amplify the economic impact of geoeconomic trade fragmentation, depending on their strategic choices. Their role as economic bridges between increasingly separated trading blocs makes them crucial for understanding the implications of geoeconomic fragmentation.

This paper quantifies how the position of non-aligned countries affects welfare outcomes in various scenarios of global trade fragmentation. Using a state-of-the-art quantitative trade model covering 141 countries and 65 economic sectors, we simulate three distinct scenarios: one where non-aligned countries maintain their neutral position, and two alternatives where they align with either Western or Eastern blocs. Our results reveal that non-aligned countries significantly influence global welfare outcomes. In a scenario of incomplete fragmentation, where these countries maintain their neutral stance, large non-aligned countries benefit from their position, experiencing welfare gains of up to 0.7 percent. However, these gains turn into substantial losses if they join either bloc. For instance, Mexico's welfare would decline by 7.2 percent if joining the Eastern bloc, compared to 1.1 percent if aligning with the West. Moreover, the position of non-aligned countries critically affects major economies – China's welfare losses nearly double when non-aligned countries join the Western bloc. Finally, our sectoral analysis reveals substantial heterogeneity in how industries are affected by fragmentation and alignment choices. In particular, under neutrality, non-aligned countries' manufacturing sectors benefit significantly, with value added increasing by 2.5 percent, while agriculture and services face modest declines.

Our findings contribute to our understanding of geoeconomic fragmentation by highlighting the strategic importance of connector countries. We demonstrate how the position and choices of non-aligned countries could reshape the economic consequences of geoeconomic fragmentation.

Literature. An increasing number of recent studies has examined various aspects of geoeconomic trade fragmentation and policy-driven deglobalization.[1] One strand of this literature documents early evidence of trade being increasingly fragmented along geopolitical lines: Gopinath et al. (2024), Fernández-Villaverde et al. (2024), Bonadio et al. (2024) and Conteduca et al. (2025) provide evidence for first signs of geoeconomic fragmentation at the level of global trade flows. For the

[1] Mohr and Trebesch (2024) provide an excellent review over the fast growing literature on geoeconomics.

specific case of US-Chinese trade relations, Alfaro and Chor (2023) and Freund et al. (2024) show a decrease in US direct exposure to Chinese suppliers between 2017 and 2022, but an increase in indirect linkages through trade partners such as Mexico, which serve as a connector between the two economies. Building on these insights, Aiyar and Ohnsorge (2024) construct an index of geoeconomic connectedness at the country-level, formalizing the idea of connector countries.

Another strand of the literature uses quantitative trade models to assess the economic costs of fragmentation. Several studies show that policy-driven reversals of global economic integration could lead to substantial welfare losses. Among others, Bolhuis et al. (2023), Javorcik et al. (2024), Campos et al. (2023), Góes and Bekkers (2023) and Attinasi et al. (2024a) quantify the economic costs of geoeconomic trade fragmentation. Our study differs from the literature in that we explicitly analyze the role of non-aligned countries in mitigating or amplifying the effects of fragmentation. Building on this literature, we provide a quantitative assessment of how non-aligned countries influence welfare outcomes in different fragmentation scenarios and analyze their strategic position.

2 Model and Scenarios

We employ a quantitative trade model based on Caliendo and Parro (2015), who develop a multi-sector version of the Ricardian trade model by Eaton and Kortum (2002) with input-output linkages. International linkages are captured through input-output relationships, with the model incorporating both tariff and non-tariff trade barriers. The model covers 141 countries and 65 economic sectors, accounting for over 90 percent of global value added. It is parameterized through econometric estimations resulting from theoretical equilibrium conditions, allowing us to simulate general equilibrium effects of various trade policy scenarios.[2]

To simulate different scenarios of geoeconomic fragmentation we assume three distinct groups of countries: an US-led Western bloc, a China-lead Eastern bloc and a group of non-aligned countries. Similar to Campos et al. (2023), we classify countries into these groups based on their April 7, 2022 vote in the UN General Assembly on the suspension of Russian membership in the Human Rights Council (Figure 1). Countries that voted in favor of the resolution form the Western bloc, those voting against constitute the Eastern bloc, while abstaining countries form our group of non-aligned countries.[3]

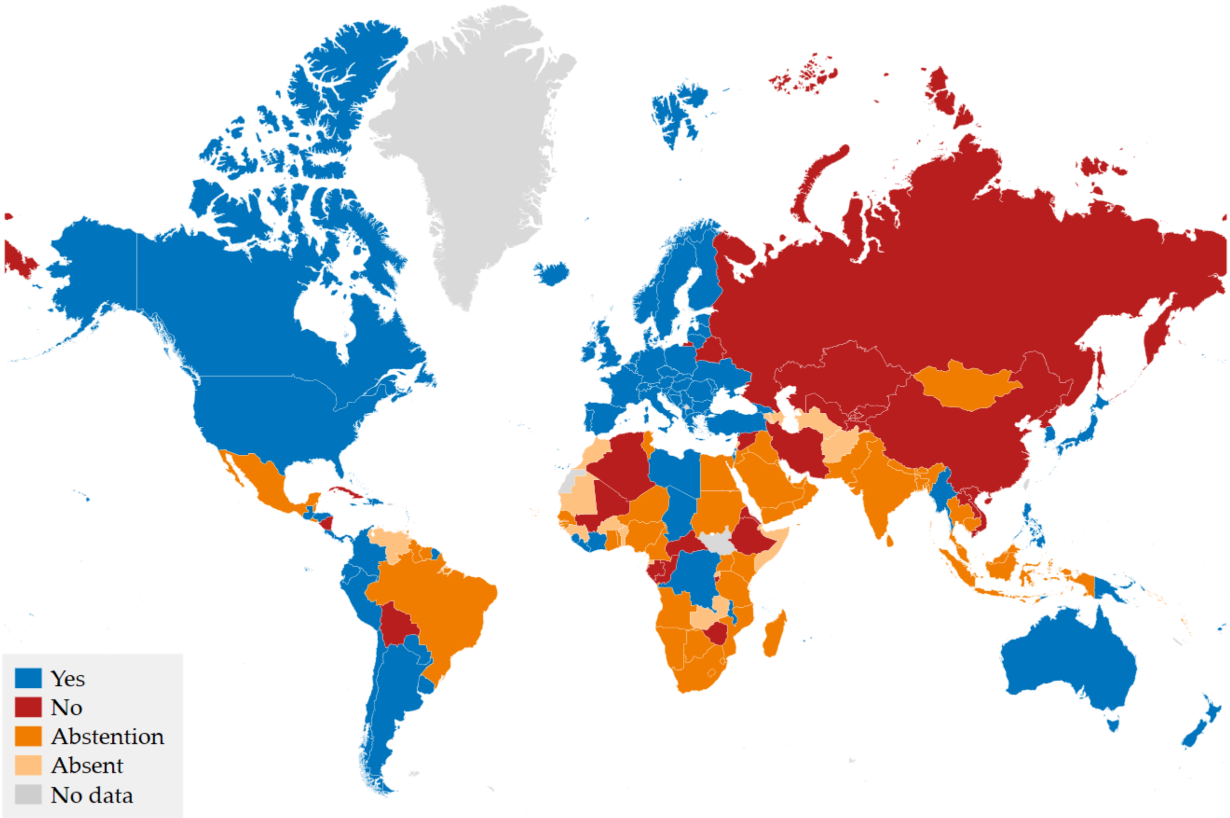
Using this framework, we analyze three scenarios of increasing geoeconomic fragmentation:

1. *Incomplete Fragmentation (Baseline):* The Western and Eastern blocs impose substantial trade barriers against each other, while non-aligned economies maintain their neutral position and face no additional trade restrictions. This scenario approximates an incomplete fragmentation of the world economy where some countries can play the role of connector economies.

[2]We calibrate the baseline equilibrium using the Global Input-Output database GTAP 10. The technical details of the model are described among others in Felbermayr et al. (2022) and Flach et al. (2024). We provide an overview of the model in Appendix C.

[3]A complete list of countries by each group is included in Appendix A.

Figure 1: UN Vote on Suspension of Russian Membership in the Human Rights Council



Notes: This Figure shows the UN General Assembly vote on the resolution adopted on 7 April 2022 concerning the suspension of the rights of membership of the Russian Federation in the Human Rights Council.
Source: UN General Assembly Resolution ES-11/L.4.

2. *Complete Western Integration:* All non-aligned countries join the Western bloc, leading to a bipolar world with an enlarged Western bloc facing the Eastern bloc. This simulates the dissolution of the neutral group through Western alignment.

3. *Complete Eastern Integration:* Connector economies align with the Eastern bloc, creating an alternative bipolar configuration. This allows us to analyze the asymmetric effects of different alignment choices.

In each scenario, we model trade barriers through both tariff increases (to 25 percent) and a doubling of non-tariff barriers between opposing blocs. This combination of barriers effectively approximates decoupling between blocs while maintaining technically feasible trade flows for essential goods and raw materials.

Our welfare analysis focuses on real income effects, which represent changes in consumption possibilities accounting for price adjustments. The simulated effects describe long-term equilibrium outcomes, abstracting from short-term adjustment costs and dynamic effects on investment or innovation. Details of the model are described in Appendix C.

3 Results

3.1 Incomplete Fragmentation and the Benefits of non-alignment

In our baseline scenario of incomplete fragmentation, non-aligned countries emerge as potential beneficiaries of their neutral position. While in the new equilibrium direct trade between Western and Eastern blocs is by over 90 percent lower, trade within blocs is significantly higher - by 5.3 percent within the Western bloc and 23.7 percent within the Eastern bloc. Trade between non-aligned countries is also 5.0 percent higher in the counterfactual scenario with incomplete fragmentation.

Major non-aligned economies experience welfare gains: India and Mexico both see increases in real income of 0.7 percent, while Indonesia and South Africa gain 0.4 percent. The gains for connector economies come amid substantial global welfare losses. The Western bloc faces a welfare decline of 1.4 percent, while the Eastern bloc experiences more severe losses of 5.9 percent. Within these blocs, effects are heterogeneous: China's real income falls by 4.5 percent, while U.S. losses are limited to 0.8 percent, reflecting different degrees of trade exposure.

The role of connector economies in mitigating fragmentation costs becomes evident when analyzing changes in trade flow. While direct trade between West and East nearly ceases, indirect trade via connector economies grows substantially. These countries increase their exports to the Western bloc by 7.9 percent while their imports from the East grow by 34.9 percent, reflecting price adjustments and comparative advantage shifts. This pattern suggests that connector economies partially substitute for the broken direct trade links between the main blocs, though at the cost of global welfare losses.

3.2 Complete Fragmentation and the Costs of Bloc Alignment

The dissolution of the neutral group through alignment with either bloc reinforces the strategic importance of connector economies. We find stark asymmetries in welfare outcomes depending on which bloc these countries join.

When connector economies align with the Western bloc, their previous gains turn into losses (-2.0 percent on average). Individual country effects vary substantially: Mexico's welfare declines by 1.1 percent, while India faces a larger decline of 1.5 percent. For the original Western bloc members, this enlargement provides limited benefits – U.S. welfare losses remain similar (-0.9 percent compared to -0.8 percent under incomplete fragmentation), suggesting that the advantages of an expanded bloc are offset by the loss of connector economies' intermediary function.

The impact on the Eastern bloc is particularly severe in this scenario. China's welfare losses nearly double from -4.5 percent to -8.0 percent when connector economies join the West, highlighting how crucial these countries' neutral position was for maintaining indirect trade linkages.

Table 1: Welfare Effects Under Alternative Fragmentation Scenarios

	Welfare Change (%)		
Country/Region	Incomplete Fragmentation	West Alignment	East Alignment
Western Bloc			
United States	-0.8	-0.9	-1.8
European Union	-1.6	-1.1	-2.4
Japan	-1.6	-1.3	-3.2
United Kingdom	-1.1	-1.3	-2.4
Eastern Bloc			
China	-4.5	-8.0	-5.2
Vietnam	-12.3	-12.3	-9.5
Connector Countries			
Saudi Arabia	2.4	2.2	-14.1
Malaysia	2.1	-2.1	-11.7
India	0.7	-1.5	-2.2
Mexico	0.7	-1.1	-7.2
Indonesia	0.4	-0.8	-3.5
South Africa	0.4	-2.3	-4.6
Brazil	0.1	-1.1	-1.9
Singapore	0.1	-3.7	-13.4
Aggregated Effects			
Western Bloc	-1.4	-1.2	-2.4
Eastern Bloc	-5.9	-8.8	-6.2
Connector Countries	0.2	-2.0	-6.1
World	-1.9	-2.7	-3.7

Notes: The table compares welfare effects across three scenarios: (1) Incomplete fragmentation where connector economies remain neutral, (2) Complete fragmentation where they join the Western bloc, and (3) Complete fragmentation where they join the Eastern bloc. All values show percentage changes in real income.

Alignment with the Eastern bloc produces even more dramatic effects. Connector economies face substantially larger welfare losses in this scenario (-6.1 percent on average). Mexico's losses soar to -7.2 percent, illustrating the costs of severing existing strong trade relationships with the West.

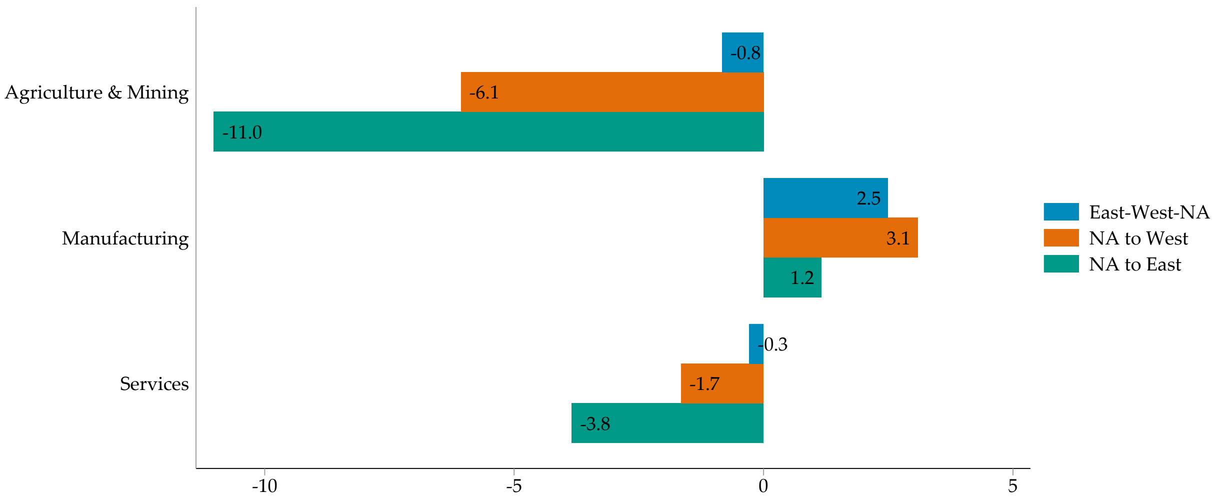
These results demonstrate that the economic costs of complete fragmentation are asymmetric and depend on existing trade patterns. For most connector economies, maintaining neutrality or aligning with the Western bloc is preferable to Eastern alignment, reflecting their generally stronger existing trade ties with Western economies. The findings also highlight how the intermediary role of connector economies helps mitigate the costs of fragmentation in the baseline scenario.

The global implications of complete fragmentation are substantial. World welfare losses increase from -1.9 percent under incomplete fragmentation to -2.7 percent when connector economies join the West, and further to -3.7 percent if they align with the East.

3.3 Sectoral Effects

The aggregate welfare effects mask substantial heterogeneity across sectors in non-aligned economies. When these countries maintain their neutral position, their manufacturing sector benefits, experiencing a 2.5 percent increase in value added (Figure 2, more details in Table B1). This positive effect strengthens to 3.1 percent when joining the Western bloc but diminishes to 1.2 percent under Eastern alignment. Within manufacturing, certain industries show particularly strong responses: computer and electronic products (+15.2 percent), leather products (+17.0 percent), and wearing apparel (+12.8 percent) benefit substantially under incomplete fragmentation.

Figure 2: Change in value-added



Notes: This Figure shows the sectoral changes in value added for the group of non-aligned countries. The sectoral value added benchmark is based on GTAP 10. The figure value added effects across three scenarios: (1) Incomplete fragmentation where connector economies remain neutral, (2) Complete fragmentation where they join the Western bloc, and (3) Complete fragmentation where they join the Eastern bloc.
Source: GTAP 10, ifo Trade Model.

Agriculture and mining, however, show a different pattern. These sectors face modest losses (-0.8 percent) under neutrality, but experience severe contractions when connector economies align with either bloc (-6.1 percent under Western and -11.0 percent under Eastern alignment). The services sector follows a similar declining pattern, with effects ranging from -0.3 percent under neutrality to -3.8 percent under Eastern alignment.

These sectoral patterns reflect connector economies' role in global supply chains. Manufacturing industries benefit from trade diversion and their position as alternative suppliers to both blocs.

4 Conclusion

Our analysis reveals the crucial role of connector economies in scenarios of global trade fragmentation. While these countries can benefit from their neutral position in a partially fragmented world, with welfare gains of up to 0.7 percent, their alignment choices have significant implications for global welfare outcomes.

The asymmetric effects of different alignment choices are striking. When connector economies join the Western bloc, global welfare losses increase from -1.9 to -2.7 percent, while Eastern alignment leads to even larger global losses of -3.7 percent. These differences reflect existing trade patterns and highlight how connector economies' intermediary function helps preserve economic efficiency in the global trading system.

These findings have important implications for both trade policy and international relations. For connector economies, maintaining neutrality offers economic advantages over alignment with either bloc. Moreover, their position as trade intermediaries helps mitigate the negative effects of fragmentation on the global economy. This suggests that supporting connector economies' continued neutral engagement with both blocs could be crucial for limiting the costs of increasing geoeconomic tensions.

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A List of countries by bloc

Bloc: West

GTAP Code	Country Name	GTAP Code	Country Name
ALB	Albania	JAM	Jamaica
ARG	Argentina	JPN	Japan
AUS	Australia	KOR	South Korea
AUT	Austria	LTU	Lithuania
BEL	Belgium	LUX	Luxembourg
BGR	Bulgaria	LVA	Latvia
CAN	Canada	MDA	Moldova
CHE	Switzerland	MLT	Malta
CHL	Chile	MUS	Mauritius
CIV	Cote d Ivoire	MWI	Malawi
COL	Colombia	NLD	Netherlands
CRI	Costa Rica	NOR	Norway
CYP	Cyprus	NZL	New Zealand
CZE	Czech Republic	PAN	Panama
DEU	Germany	PER	Peru
DNK	Denmark	PHL	Philippines
DOM	Dominican Republic	POL	Poland
ECU	Ecuador	PRI	Puerto Rico
ESP	Spain	PRT	Portugal
EST	Estonia	PRY	Paraguay
FIN	Finland	ROU	Romania
FRA	France	SVK	Slovakia
GBR	United Kingdom	SVN	Slovenia
GEO	Georgia	SWE	Sweden
GRC	Greece	TUR	Turkey
GTM	Guatemala	TWN	Taiwan
HND	Honduras	UKR	Ukraine
HRV	Croatia	URY	Uruguay
HUN	Hungary	USA	USA
IRL	Ireland	XEF	Iceland, Liechtenstein
ISR	Israel	XER	Rest of Europe
ITA	Italy	XNA	Rest of North America

Bloc: East

GTAP Code	Country Name	GTAP Code	Country Name
BLR	Belarus	LAO	Laos
BOL	Bolivia	NIC	Nicaragua
CHN	China	RUS	Russia
ETH	Ethiopia	TJK	Tajikistan
HKG	Hong Kong	VNM	Vietnam
IRN	Iran	XEA	North Korea, Macao
KAZ	Kazakhstan	XSU	Rest of Former Soviet Union
KGZ	Kyrgyzstan	ZWE	Zimbabwe

Bloc: Non-aligned

GTAP Code	Country Name	GTAP Code	Country Name
ARE	United Arab Emirates	NPL	Nepal
ARM	Armenia	OMN	Oman
AZE	Azerbaijan	PAK	Pakistan
BEN	Benin	QAT	Qatar
BFA	Burkina Faso	RWA	Rwanda
BGD	Bangladesh	SAU	Saudi Arabia
BHR	Bahrain	SEN	Senegal
BLZ	Belize	SGP	Singapore
BRA	Brazil	SLV	El Salvador
BRN	Brunei Darussalam	TGO	Togo
BWA	Botswana	THA	Thailand
CMR	Cameroon	TTO	Trinidad and Tobago
EGY	Egypt	TUN	Tunisia
GHA	Ghana	TZA	Tanzania
GIN	Guinea	UGA	Uganda
IDN	Indonesia	VEN	Venezuela
IND	India	XAC	South Central Africa
JOR	Jordan	XCB	Rest of Caribbean
KEN	Kenya	XCF	Rest of Central Africa
KHM	Cambodia	XEC	Rest of Eastern Africa
KWT	Kuwait	XNF	Rest of North Africa
LKA	Sri Lanka	XOC	Rest of Oceania
MAR	Morocco	XSA	Afghanistan, Bhutan, Maldives
MDG	Madagascar	XSC	Rest of South African Customs Union
MEX	Mexico	XSE	Myanmar, Timor-Leste
MNG	Mongolia	XSM	Rest of South America
MOZ	Mozambique	XTW	Rest of the World
MYS	Malaysia	XWF	Rest of Western Africa
NAM	Namibia	XWS	Rest of Western Asia
NGA	Nigeria	ZAF	South Africa

B Sectoral Effects

Table B1: Sectoral value added changes for three different bloc scenarios: Non-aligned

Sector	Value added benchmark in Bn. USD	East-West-NA Δ sectoral value added in Bn. USD (1)	in % (2)	NA to West Δ sectoral value added in Bn. USD (3)	in % (4)	NA to East Δ sectoral value added in Bn. USD (5)	in % (6)
Agriculture & Mining	3214,00	-26,71	-0,8	-194,96	-6,1	-354,42	-11,0
Manufacturing	1933,92	48,19	2,5	59,73	3,1	22,38	1,2
Chemical products	194,35	-1,93	-1,0	-9,24	-4,8	17,16	8,8
Motor vehicles and parts	155,64	-0,38	-0,2	-4,41	-2,8	14,83	9,5
Computer, electronic and optical products	147,28	22,32	15,2	14,66	10,0	-10,78	-7,3
Mineral products nec	132,00	-0,83	-0,6	4,42	3,3	-5,33	-4,0
Machinery and equipment nec	130,72	2,45	1,9	3,68	2,8	21,64	16,6
Rubber and plastic products	128,78	-0,23	-0,2	0,77	0,6	-0,49	-0,4
Ferrous metals	115,10	-0,80	-0,7	7,71	6,7	12,27	10,7
Metal products	115,05	0,08	0,1	4,60	4,0	6,49	5,6
Petroleum, coal products	105,19	2,57	2,4	0,12	0,1	-0,47	-0,4
Manufactures nec	100,61	0,90	0,9	2,23	2,2	-11,63	-11,6
Textiles	99,56	2,29	2,3	11,79	11,8	-9,62	-9,7
Wearing apparel	97,07	12,42	12,8	14,78	15,2	-28,59	-29,5
Metals nec	85,08	2,40	2,8	-4,07	-4,8	-4,48	-5,3
Paper products, publishing	67,71	-0,92	-1,4	-1,51	-2,2	4,99	7,4
Basic pharmaceutical products	60,91	0,33	0,5	0,21	0,3	9,11	15,0
Transport equipment nec	59,77	-0,18	-0,3	1,23	2,1	21,90	36,6
Electrical equipment	54,12	3,32	6,1	4,87	9,0	-5,60	-10,3
Wood products	51,22	-1,34	-2,6	-0,65	-1,3	-3,22	-6,3
Leather products	33,78	5,74	17,0	8,54	25,3	-5,81	-17,2
Services	7775,69	-22,09	-0,3	-128,54	-1,7	-298,86	-3,8

Notes: The table shows the sectoral changes in value added for different economic sectors. The sectoral value added benchmark is based on GTAP 10.
Source: GTAP 10, ifo Trade Model.

C Theoretical Model

The model follows Caliendo and Parro (2015), who extend the Ricardian trade model by Eaton and Kortum (2002) to a multisector setting. In this framework, there are N countries indexed by i and n, as well as J sectors indexed by j and k. Sectoral goods are either used as inputs in production or consumed, with the representative consumer having Cobb-Douglas preferences over consumption C_n^j of sectoral final goods with expenditure shares $\alpha_n^j \in (0,1)$ and $\sum_j \alpha_n^j = 1$.

In each sector j, there is a continuum of intermediate goods producers indexed $\omega^j \in [0,1]$ who combine labor and composite intermediate input and who differ with respect to their productivity $z_i^j(\omega^j)$. Intermediate goods are aggregated into sectoral composites using CES production functions with elasticity η^j. Labor L_n is mobile across sectors but not between countries. The model assumes perfect competition.

A firm in country i can supply its output at price

$$p_{in}^j(\omega^j) = \kappa_{in}^j \frac{c_i^j}{z_i^j(\omega^j)} \text{ with } c_i^j = \Upsilon_i^j (w_i)^{\beta_i^j} \left[\prod_{k=1}^{J} \left(p_i^k\right)^{\gamma_i^{k,j}}\right]^{(1-\beta_i^j)}. \tag{1}$$

The minimum cost of an input bundle is c_i^j, where Υ_i^j is a constant, w_i is the wage rate in country i, p_i^k is the price of a composite intermediate good from sector k, $\beta_i^j \geq 0$ is the value added share in sector j in country i and $\gamma_i^{k,j}$ denotes the cost share of source sector k in sector j's intermediate costs, with $\sum_{k=1}^{J} \gamma_i^{k,j} = 1$. κ_{in}^j denotes trade costs of delivering sector j goods from country i to country n such that $\kappa_{in}^j = (1+t_{in}^j) D_{in}^{\rho^j} e^{\text{ffi}^j \mathbf{Z}_{in}}$, where $t_{in}^j \geq 0$ denotes ad-valorem tariffs, D_{in} is bilateral distance, and $\mathbf{Z}_{in}$ is a vector collecting trade cost shifters, such as changes in non-tariff barriers, free trade agreements, and other trade policies.

Productivity of intermediate goods producers follows a Fréchet distribution with a location parameter $\lambda_n^j \geq 0$ that varies by country and sector (a measure of absolute advantage) and shape parameter θ^j that varies by sector (and captures comparative advantage). Convergence requires $1 + \theta^j > \eta^j$.

Producers of sectoral composites in country n search for the supplier with the lowest cost such that $p_n^j = \min_i \left\{ p_{in}^j(\omega^j); i = 1, \ldots, N \right\}$. Caliendo and Parro (2015) show that it is possible to derive a closed form solution of composite intermediate goods price

$$p_n^j = A^j \left(\sum_{i=1}^{N} \lambda_i^j \left(c_i^j \kappa_{in}^j \right)^{\frac{-1}{\theta^j}} \right)^{-\theta^j}, \tag{2}$$

where $A^j = \Gamma \left[1 + \theta^j (1 - \eta^j) \right]^{\frac{1}{1-\eta^j}}$ is a constant.

Similarly, a country n's expenditure share π_{in}^j for source country i's goods in sector j is

$$\pi_{in}^j = \frac{\lambda_i^j \left[c_i^j \kappa_{in}^j \right]^{\frac{-1}{\theta^j}}}{\sum_{i=1}^{N} \lambda_i^j \left[c_i^j \kappa_{in}^j \right]^{\frac{-1}{\theta^j}}}, \tag{3}$$

which forms the core of a gravity equation.

C.1 General Equilibrium

Let Y_n^j denote the value of gross production of varieties in sector j. For each country n and sector j, Y_n^j has to equal the value of demand for sectoral varieties from all countries $i = 1, \ldots, N$. As in Flach et al. (2024), our exposition differs from Caliendo and Parro (2015) in that they use total expenditure on composite goods instead of total production of varieties as endogenous variable. So in Caliendo and Parro (2015) the value of gross production comprises all foreign varieties that are bundled into the composite good without generation of value added. The goods market clearing condition is given by

$$Y_n^j = \sum_{i=1}^{N} \frac{\pi_{ni}^j}{(1 + t_{ni}^j)} X_i^j \qquad \text{with} \qquad X_i^j = \sum_{k=1}^{J} \gamma_i^{j,k} (1 - \beta_i^k) Y_i^k + \alpha_i^j I_i, \tag{4}$$

where national income consists of labor income, tariff rebates R_i and the (exogenous) trade surplus S_i, i.e. $I_i = w_i L_i + R_i - S_i$ and X_i^j is country i's expenditure on sector j goods. The first term on the right-hand side gives demand of sectors k in all countries i for intermediate usage of sector j varieties produced in country n, the second term denotes final demand. Tariff rebates are $R_i = \sum_{j=1}^{J} X_i^j \left(1 - \sum_{n=1}^{N} \frac{\pi_{ni}^j}{(1+t_{ni}^j)} \right)$.

The second equilibrium condition requires that for each country n, the value of total imports, domestic demand and the trade surplus has to equal the value of total exports including domestic sales, which is equivalent to total output Y_n:

$$\sum_{j=1}^{J}\sum_{i=1}^{N}\frac{\pi_{in}^{j}}{(1+t_{in}^{j})}X_n^j + S_n = \sum_{j=1}^{J}\sum_{i=1}^{N}\frac{\pi_{ni}^{j}}{(1+t_{ni}^{j})}X_i^j = \sum_{j=1}^{J} Y_n^j \equiv Y_n. \tag{5}$$

Conditions (4) and (5) close the model.

C.2 Comparative statics in general equilibrium

We are interested in the effect of different scenarios of geoeconomic fragmentation on trade flows, sectoral value added, and real income. For this purpose, we quantify the comparative static effects of changes in trade costs on endogeneous quantities such as trade flows and sectoral value added.

Following Caliendo and Parro (2015) and Dekle et al. (2008), we solve the model in changes. Let z denote the initial level of a variable and z' its counterfactual level. Then, trade cost shocks are given by $\hat{\kappa}_{in}^{j} = \frac{1+t_{in}^{j'}}{1+t_{in}^{j}} e^{\delta^j (Z'_{in} - Z_{in})}$.

The change in real income, our measure of welfare, is given by

$$\hat{W}_n = \frac{\hat{I}_n}{\prod_{j=1}^{J} (\hat{p}_n^j)^{\alpha_n^j}}. \tag{6}$$

We solve for counterfactual changes in all variables of interest using a system of equations. We solve the system for multiple sectors using a multi-sector solution algorithm as in Caliendo and Parro (2015). Solving the model in changes has the advantage of reducing the set of parameters and moments that have to be estimated and calibrated, as for instance no data on price levels or productivity levels are needed. Hence, it decreases data requirements and minimizes the potential for measurement error, albeit at the cost of functional assumptions.

Our results on comparative statics refer to the long-run general equilibrium effects of different trade policy scenarios.