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Beyond borders: how geopolitics is reshaping trade

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Abstract

Rising trade tensions, a spate of trade-inhibiting policy measures and a weakening of multilateral institutions have sparked a growing concern about the potential implications of global trade fragmentation. Yet, empirical evidence that geopolitical considerations are already materially affecting trade flows is scant. In this study, we quantify the impact of geopolitical tensions on trade of manufacturing goods over the period 2012-2022 in a structural gravity framework. To capture the influence of geopolitical tensions, we use a measure of geopolitical distance based on the UN General Assembly voting. The econometric analysis offers robust evidence that geopolitical distance has become a trade friction and its impact has steadily increased over time. Our results suggest that a 10% increase in geopolitical distance, like the observed increase in the US-China distance since 2018, is associated with a reduction in trade by about 2%. Our findings also highlight a differential and stronger impact on advanced economies and the emergence of friend-shoring.

JEL-Classification: F10, F13, F14. F15.
Keywords: trade fragmentation, structural gravity models, geopolitics, friend-shoring, trade costs.

Non-technical summary

Globalisation has been an all-conquering force over the last decades, yet recent trade shocks cast doubts about its future. Rising trade tensions and a spate of policies across countries aiming to bring national security concerns to bear in trade policies have sparked growing concern about the potential implications of geo-economic fragmentation. A surge in trade restriction measures has been evident in recent years. Concerns about trade resilience and national security have been heightened in the wake of Russia's invasion of Ukraine, with growing debate about the need for protectionism, nearshoring and friend-shoring. Recent industrial policies (e.g., the US Inflation Reduction Act and the European Chips Act) contain provisions that aim at providing incentives to domestic producers to the detriment of foreign producers, especially in technologically advanced sectors. The risk of global trade fragmentation and the potential for a growing influence from geopolitical concerns would appear to have increased significantly.

Yet, empirical evidence that geopolitical concerns are already materially affecting trade patterns is still limited. Against this backdrop, this paper provides novel empirical evidence on the growing importance of geopolitics at shaping trade flows in manufacturing goods. We augment a state-of-the art gravity model to include a measure of geopolitical distance based on UN General Assembly voting patterns. We find that the impact of geopolitics on trade is economically significant: a 10% increase in geopolitical distance decreases bilateral trade flows by 2.5% in 2021-22. Beyond deteriorating relations between the US and China, our estimates point to a broader reshape of cross-country trade patterns driven by geopolitical forces.

When we analyse the heterogeneity of the impact of geopolitics on trade across groups of countries, we find a stronger and differential impact for advanced economies (AEs) vis-à-vis emerging economies (EMDEs). This finding may reflect the effect of increasing trade restrictions, notably export controls and the rise of import-substituting subsidies by richest countries. Furthermore, we show that the main channel through which geopolitics is shaping trade flows is represented by friend-shoring, whereas we find no evidence of near-shoring.

The contribution of this paper to the literature is twofold. To the best of our knowledge, this article is the first to provide robust empirical evidence of the increasing importance over time of geopolitical distance as a barrier to trade. Compared to a very recent but fast-growing literature on trade fragmentation, our results are obtained using a panel gravity model with three-way fixed effects, controlling for tariffs, trade agreements and also for border effects, i.e., unobservable factors affecting international trade relative to domestic trade. This three-way fixed effects approach enables us to minimise the possibility that the index of geopolitical distance captures the role of other factors that could drive trade flows. Second, we bring a further innovative contribution to the literature by explicitly addressing endogeneity concerns of geopolitics for trade. First, we exclude energy-related products from manufacturing goods to rule out the potential bias deriving from the use of energy flows as political leverage by opposing countries. Next, we adopt a instrumental variable (IV) strategy using a novel instrument based on the exposure to terrorism. Importantly, IV results converge substantially to our baseline estimates.

In conclusions, our results point to a redistribution of global trade flows driven by geopolitical forces. The new forces that now drive global trade are no longer guided by profit-oriented strategies alone but also by geopolitical alignment. At the same time, friend-shoring strategies, coupled with efforts to promote reindustrialisation, encompass a trade-off between risk minimisation and cost efficiency. Furthermore, a deepening of fragmentation would also inhibit efforts to address other global challenges, from climate change and green transition to an efficient regulatory framework in both trade and the global payment system.

1 Introduction and Motivation

Globalisation has been an all-conquering force over the last decades. Since the end of World War II, integration into the world economy, sustained by transportation, technological advances and trade liberalisation has resulted in a powerful tool for countries to boost economic growth, development and poverty reduction. 2001 marked a significant turning point when China joined the World Trade Organization (WTO), thereby starting its pivotal role as a global manufacturing hub. Concurrently, the development of the internet favoured a further integration of global value chains, giving the possibility of conducting R&D in one country, producing in another, sourcing in yet another and eventually distributing all over the world (World Economic Forum, 2019). This resulted in what was defined by the World Economic Forum (2019) as “globalisation on steroids”, where trade, considered as the sum of exports and imports, grew to over than half of world GPD in the 2000s. Most people benefited from higher participation in global economy and in some countries, trade took up more than 100% of GDP. In this ever-changing, ever-growing environment, little was said about a potential halt to the dizzying rise of global trade.

Yet, in the aftermath of the Great Recession, global trade has grown at a slower pace (see Figure 1). This trend has been dubbed as “slowbalisation” (Antràs, 2021) and it could be interpreted as the natural development of global trade following its earlier fast growth (Baldwin, 2022; Goldberg & Reed, 2023). However, the recent escalation of geopolitical tensions casts doubts about the resilience of supply chains and ultimately of global trade.

Early concerns about trade resilience date back to the mid-2010s, coinciding with Brexit, the beginning of Trump’s administration and the subsequent war of tariffs between the US and China, which saw protectionism making the first notable come-back into US trade policy in over a century. The Covid-19 pandemic furtherly emphasized the risk of excessive dependence on foreign suppliers of critical products and waning national self-sufficiency (Irwin, 2020; Evenett, 2022). Headwinds for trade policy cooperation amid increased trade policy uncertainty have been heightened in the wake of Russia’s invasion of Ukraine, with growing debate about the need for protectionism, near-shoring friend-shoring or de-risking (Yellen, 2022; von der Leyen, 2023).

In this context, a surge in trade restriction measures has been evident in recent years, with pressing concerns for national security and strategic competitiveness (see Figure 2).[1] As an example, recent industrial policies involving either trade measures or subsidies to specific firms, contain provisions that aim at providing incentives to domestic producers,

[1] The number of trade restrictions imposed by countries rose from almost 2,100 in 2019 to 3,500 in 2022, peaking at 4,500 in 2020. Metals, cereals, pharmaceuticals and high-tech sectors have been the most affected by these measures.

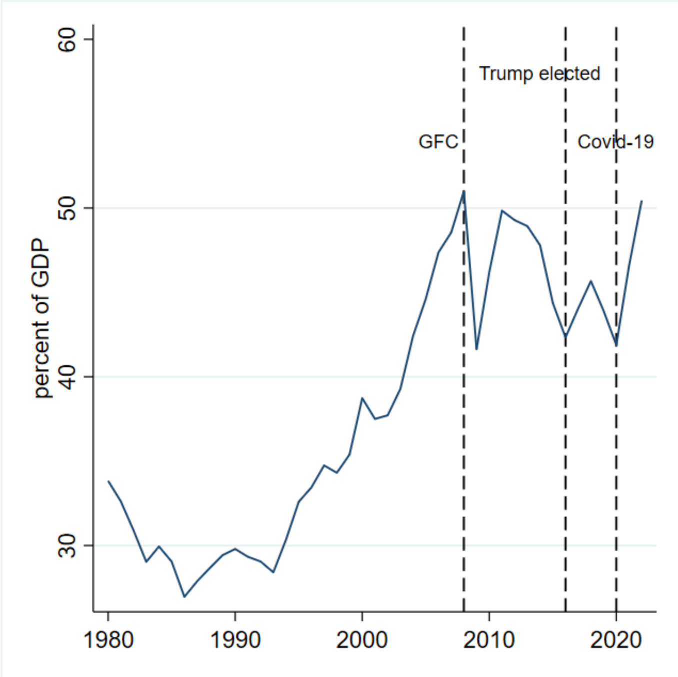

Fig. 1: World Trade. Source: World Bank – World Development Indicators.

especially those in technologically advanced sectors, possibly to the detriment of foreign producers. The risk of a fragmentation of trade along geopolitical lines appears to have increased significantly.

Against this backdrop, this paper provides new evidence and quantifies the timing and the impact of geopolitical tensions on manufacturing trade over the last decade. To do so, we augment a theory-consistent structural gravity model estimated for 63 countries over the period 2012-2022 to include a measure of geopolitical distance based on UN General Assembly (UNGA) voting records from Bailey et al. (2017).[2] Intuitively, the rapid rise in trade tensions alongside trade-inhibiting policy measures observed in recent years should be reflected in increasing estimates over time of the effect of geopolitics in gravity estimations. Motivated by this intuition, we allow for time-varying effects of all gravity variables in our main specifications.

Our findings offer robust evidence that geopolitical distance has become an increasingly important determinant of trade patterns. In our benchmark specification -i.e., in which we exclude energy-related goods from manufacturing trade- the elasticity of geopolitical distance turns negative and significant from 2018 and has steadily increased over time. The effect is economically significant. Our estimates suggest that a 10% increase in

[2] Our analysis starts in 2012 to avoid the bias stemming from particularly negative economic effect of the global financial crisis.

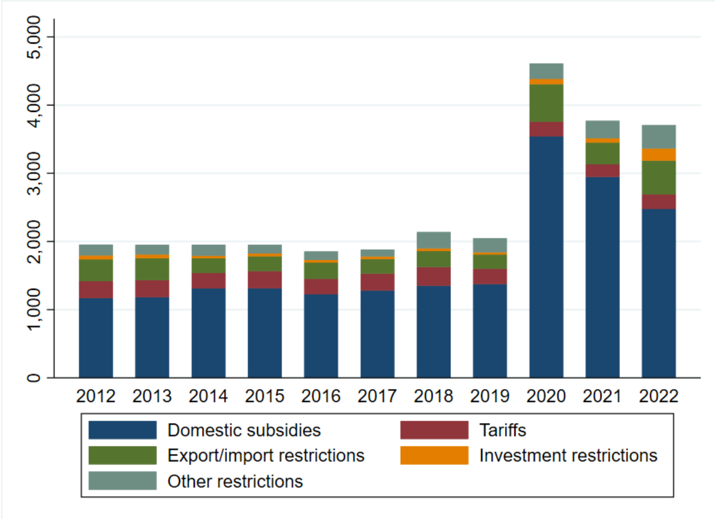

Fig. 2: New Trade Restrictions. Source: Global Trade Alert (GTA) and authors' calculations. Notes: This chart shows the number of new trade interventions imposed in each year. The GTA database documents all unilateral changes in the relative treatment of foreign versus domestic commercial interests. Only interventions that the GTA deems "certain to discriminate against foreign commercial interests" are included.

geopolitical distance - like the observed increase in the US-China distance since 2018 - is found to decrease bilateral trade flows by about 2%. Beyond deteriorating relations between the US and China, our estimates point to a broader reshape of cross-country trade patterns driven by geopolitical forces. When we analyse the heterogeneity of the impact of geopolitics on trade across groups of countries, we find a stronger and differential impact for advanced economies (AEs) vis-à-vis emerging economies (EMDEs). This finding may reflect the effect of increasing trade restrictions, notably export controls and the rise of import-substituting subsidies by richest countries.

Furthermore, we show that the main channel through which geopolitics is shaping trade flows is represented by friend-shoring, whereas we find no evidence of near-shoring. Since 2018, trade among like-minded countries has increased, while trade among geopolitically distant partners has decreased. The net negative effect of geopolitics on overall trade appears to be mitigated by trade diversion, yet model-based assessments warn about potentially considerable negative effects following a fragmentation of global trade along geopolitical lines. General equilibrium trade models illustrate that restrictions on trade between countries belonging to opposing geopolitical blocs could entail sizeable economic costs in terms of lower trade, lower welfare and higher prices (Góes & Bekkers, 2022; Javorcik et al., 2022; Attinasi et al., 2023; Bolhuis et al., 2023; Felbermayr et al., 2023).[3]

[3] Góes and Bekkers (2022) include a knowledge diffusion channel in a trade model, exploring several

The contribution of this paper to the literature is twofold. To the best of our knowledge, this article is the first to provide robust empirical evidence of the increasing importance over time of geopolitical distance as a barrier to trade. Prominent recent papers that empirically investigate the role of geopolitical alignment as a driver of trade and capital flows include Campos et al. (2023), Jakubik and Ruta (2023), Aiyar et al. (2024), Gopinath et al. (2024), Hakobyan et al. (in press). While Aiyar et al. (2024) deliver novel evidence of the impact of geopolitics on foreign direct investments, the other contributions all focus on international trade flows through the lenses of a gravity model. In particular, Gopinath et al. (2024) provide evidence of a fragmentation of trade and investment flows along geopolitical lines since the onset of Russia's invasion of Ukraine, thus leading to a decline in trade between opposing geopolitical blocs compared to trade within blocs.[4] Their identification strategy relies on separating country pairs *a priori* into three different geopolitical blocs, i.e., a US leaning bloc, a China leaning bloc and a set of nonaligned countries, interacted with a time dummy equal to 1 for the post-war period. To quantify the impact of geopolitical alignment on trade in the current period (which is then compared to the Cold war period), they use a sample of quarterly data from 2017 to 2023. We differentiate from their methodology by using a time-varying bilateral index of geopolitical distance (Bailey et al., 2017) to unveil its effect on trade flows over a sample period of annual data from 2012 to 2022, crucially showing that the elasticity of geopolitical distance has been increasing over time. Furthermore, we depart from all the above-mentioned articles as we estimate a theory-consistent structural gravity model controlling for tariffs, trade agreements and international border effects,

scenarios of a decouple of trade between blocs. The results show losses ranging from 0.4 percent of GDP for some countries in a mild fragmentation scenario to 12 percent for the most affected countries under full technological decoupling. Attinasi et al. (2023) show that restrictions in trade in intermediate inputs between countries belonging to opposing geopolitical blocs could lead to an increase in the level of both consumer and producer prices in most countries, especially for trade-intensive manufacturing sectors. Bolhuis et al. (2023) use a trade model based on Caliendo and Parro (2015) accounting for production and trade across 136 commodities. In this setting, they find a more adverse economic impact of trade fragmentation compared with models which implicitly assume perfect substitutes among commodities, estimating global GDP losses ranging from 1.9 to 7 percent. Felbermayr et al. (2023)use a quantitative trade model to explore several East-West trade "decoupling" scenarios, finding welfare losses between 0 and 10 percent across countries. Javorcik et al. (2022) examine fragmentation through the lens of 'friend-shoring', finding global GDP losses ranging from 0.1 percent to 4.6 percent.

[4] Campos et al. (2023) estimate the impact of broad trade restrictions on bilateral trade and find that a one standard deviation in their indicator has the same effect as 7.6 percentage point increase in tariff rates. Their sample period stops in 2019 while we cover up to 2022. Jakubik and Ruta (2023) study the effect of geopolitics on trade conditional on the level of uncertainty. They find statistical significance only when interacting geopolitical distance and the uncertainty variable, but not for the geopolitical distance variable alone. Hakobyan et al. (in press) show that measures of geopolitical alignment act as trade barrier in some specific sectors, namely the transport sector, food and beverages and other manufacturing. The latter study is based on a cross-sectional analysis, while we use a panel dataset estimated by Poisson-Pseudo Maximum Likelihood (PPML).

i.e., unobservable factors affecting international trade relative to domestic trade.[5] This three-way fixed effects approach enables us to minimise the possibility that the index of geopolitical distance captures the role of other factors that could drive trade flows.

Second, we bring a further innovative contribution to the literature by explicitly addressing endogeneity concerns of geopolitics for trade. Reverse causality and omitted variables may represent the main sources of endogeneity in our estimates. While our rich set of fixed effects, combined with bilateral time-varying regressors included as controls in our structural gravity framework, allows to mitigate the latter, reverse causality between geopolitical distance and trade remains as a concern. We tackle this issue in two steps. First, we exclude energy-related products from trade flows. This way, we rule out the potential bias deriving from the use of energy flows as political leverage by opposing countries (Baran, 2007; Yergin, 2020). As a result, when we use trade excluding energy as dependent variable, geopolitical distance coefficients retain sizeable economic significance, albeit with a lower magnitude compared to those based on aggregate trade. Next, we adopt a instrumental variable (IV) strategy using a novel instrument based on the exposure to terrorism proposed by Enders et al. (2011). Specifically, our approach involves using the difference in terrorism incidents between country pairs as a bilateral time-varying instrument for geopolitical distance. A valid instrumental variable should be correlated with geopolitical distance, while not affecting trade directly. Differences in the exposure to terrorism serve as a proxy of differences in the political systems between countries, thereby exhibiting high correlation with geopolitical distance. Democratic nations historically face higher terrorism risks compared to authoritarian regimes (Blomberg & Rosendorff, 2009; Wilson & Piazza, 2013), meaning that country pairs with different political systems, therefore with different levels of exposure to terrorism, should also exhibit higher geopolitical distance, on average. At the same time, terrorism is not affecting trade directly, at least in the short run. Based on the control function approach to the PPML model in the spirit of Wooldridge (1999) and Lin and Wooldridge (2019), when we exclude energy from trade flows, our estimates show that I) geopolitical distance is exogenous conditional on the fixed effects and II) IV results converge substantially to those obtained with PPML. For this reason, we consider this specification as our baseline.

This paper is structured as it follows. Section 2 presents the methodology and the data. Section 3.1 provides econometric evidence of the increasing importance of geopolitical distance on international trade over time. Section 3.2 describes the heterogeneous effects of geopolitics on trade by levels of economic development across countries. Section 3.3 analyses the main channel through which the effects of geopolitics are materialising.

[5] As shown by a recent gravity literature, theory-consistent trade costs can only be identified in relative terms, i.e., international relative to domestic trade costs (Y. Yotov, 2012; Borchert & Yotov, 2017; Y. V. Yotov, 2022).

Finally, Section 4 draws the relevant conclusions.

2 Methodology

2.1 Estimation strategy

2.1.1 Theoretical framework

The analysis is based on a structural gravity model, which has been widely used to investigate the determinants of international trade, as well as to assess the impact of policy variables on trade flows (Anderson & van Wincoop, 2003; Arkolakis et al., 2012). The gravity model assumes that the volume of trade between two countries is proportional to their economic mass and a measure of their relative trade frictions. Let X_{ij} denote the value of exports from an origin country i to a destination country j. The gravity system of equations for these trade flows is:

$$X_{ij} = E_j Y_i \left(\frac{T_{ij}^{-\theta}}{\Pi_i^{-\theta} P_j^{-\theta}} \right) \tag{1}$$

$$P_j^{-\theta} = \sum_i \frac{Y_i T_{ij}^{-\theta}}{\Pi_i^{-\theta}} \tag{2}$$

$$\Pi_i^{-\theta} = \sum_j \frac{E_j T_{ij}^{-\theta}}{P_j^{-\theta}} \tag{3}$$

The first term represents the relative economic mass of the two countries, where E_j is country j's total expenditure and Y_i is country i's income. The second term represents trade costs consisting of three components: T_{ij} is a function of bilateral trade costs between exporter i and importer j, while the two structural terms Π_i and P_j are defined as outward and inward multilateral resistance terms, respectively (Anderson & van Wincoop, 2003). These terms are related to price and non-price factors that impede international trade – factors that limit an exporter's trade with all other destinations (Π_i) and an importing country's trade with trading partners (P_j). Finally, θ is the trade elasticity with respect to variable trade costs.

We define trade costs as a function of two variables: $T_{ij} = \tau_{ij}(1 + \text{tariff}_{ij})$, where τ_{ij} is a measure of iceberg trade costs and tariff_{ij} is the *ad valorem* import tariff imposed by country j on goods imported from i.[6] Typically, iceberg trade costs are proxied by bilateral geographical distance and other features that might promote or hinder

[6] See, for example, Quintieri and Stamato (2023) for a similar approach.

trade between countries (common language, trade agreement memberships, etc). Recent shocks have highlighted the potential for geopolitical factors to shape trade costs. Against this backdrop, our primary object of interest is to assess the importance over time of geopolitical distance as a determinant of trade costs, not yet explored in the broader gravity literature. We augment iceberg trade costs to include a measure of geopolitical distance based on the "ideal point distance" proposed by Bailey et al. (2017).

2.1.2 Panel estimation

Fally (2015) shows that using the PPML with fixed effects is consistent with the equilibrium constraints imposed by the introduction of multilateral resistance indexes as in Anderson and van Wincoop (2003).[7] Therefore, the system of equations (1-3) can be translated into the following empirical gravity equation:

$$X_{ij,t} = \exp\left[T_{ij,t}\beta + \varphi_{i,t} + \eta_{j,t} + \mu_{ij}\right] + \epsilon_{ij,t} \tag{4}$$

Here, $X_{ij,t}$ denotes nominal trade flows from exporter i to importer j at time t over the period 2012-2022.[8] $\varphi_{i,t}$ and $\eta_{j,t}$ are time-varying fixed effects capturing unobservable factors that affect trade, including the theoretical multilateral resistance terms, and any other country-year specific factors. Macroeconomic disturbances that occurred in the last decade, business cycle fluctuations, and divergent inflation, productivity, or competitiveness dynamics across source or destination countries are therefore captured by these terms. μ_{ij} denotes directional pair fixed effects, which allow to control for any time-invariant trade costs, such as geographical distance or historical ties. Therefore, in the vector $T_{ij,t}$ we include only bilateral time-varying trade policy variables: geopolitical distance, trade agreement indicators, bilateral tariffs, and international border effects. Such a three-way fixed effects approach enables to minimise the possibility that the index of geopolitical distance captures the role of other factors that could drive trade flows. $\epsilon_{ij,t}$ is the error term.

Our main contribution is to offer evidence of the increasing importance of geopolitical distance as a determinant of trade, which is expected to be reflected in increasing elasticities over time in our gravity estimations. Similarly, recent shocks might have affected other trade costs as well, such as trade agreements and tariffs. Therefore, we depart from standard gravity models as in Equation (4) to allow for the effects of

[7] The PPML offers two important advantages compared to alternative estimators: I) it allows for the inclusion of zeros; II) it deals with heteroscedasticity in trade data (Silva & Tenreyro, 2006).

[8] An important feature of the dependent variable is that, consistent with the recent literature, it includes not only international trade flows data ($X_{ij,t}$, j$\neq$ i) but also domestic trade flows ($X_{ii,t}$). See, for example,(Y. V. Yotov, 2022) for a discussion on the advantages of including domestic trade in the estimation of gravity equations.

trade-cost variables to vary over time, as in Y. Yotov (2012)and Borchert and Yotov (2017):

$$X_{ij,t} = \exp\Bigg[\sum_{T=2012}^{2022} \beta_1^T \ln\_\text{GEOP\_DIST\_T}_{ij,t-1} + \sum_{T=2012}^{2022} \beta_2^T \text{RTA\_T}_{ij,t} + \sum_{T=2012}^{2022} \beta_3^T \ln\_\text{tariff\_T}_{ij,t} + \sum_{T=2012}^{2022} \beta_4^T \text{BRDR\_T}_{ij,t} + \varphi_{i,t} + \eta_{j,t} + \mu_{ij}\Bigg] + \epsilon_{ij,t} \quad (5)$$

Our main variable of interest is geopolitical distance interacted with a time dummy, expressed as $\ln\_\text{GEOP\_DIST\_T}_{ij,t-1}$. $\text{RTA\_T}_{ij,t}$ is an indicator variable for the presence of a trade agreement between country i and country j at time t, whereas $\ln\_\text{tariff\_T}_{ij,t}$ denotes tariffs imposed by country j on goods imported from country i at time t. As before, trade-cost variables are interacted with period dummies. The variable $\text{BRDR\_T}_{ij,t}$ is a dummy equal to 1 for international trade observations (and zero otherwise) interacted with period dummy variables capturing border effects, which control for changes of international trade costs compared to domestic trade costs over time. Finally, we report multi-way clustered standard errors by exporter, importer and time.

With regard to the use of methods to estimate gravity models, scholars have argued against panel-data estimations over consecutive years, on the grounds that dependent and independent variables cannot fully adjust in a single-year horizon (Trefler, 2004; Cheng & Wall, 2005). This is particularly important when analysing the adjustment process of trade costs to a changing policy landscape. For this reason, we present our main results based on three-year averages of data.

2.1.3 Endogeneity of geopolitical distance

When estimating Equation (5) we face an endogeneity problem, as causality between trade flows and geopolitical distance can run both ways. Country pairs with strong trade ties are likely to share good geopolitical relationships, hence they might be incentivised to vote similarly at the UNGA. If this was happening, our estimates would be biased. Consistently, we address the issue in a number of ways.

As a preliminary response, we conduct the analysis employing a lag of geopolitical distance, which is supposed to partially mitigate the issue. Second, we exclude energy-related products from trade flows. Since energy flows are often used as a political leverage by opposing countries(Baran, 2007; Yergin, 2020), they may drive our estimates upwards. To rule out this potential bias, we use trade excluding energy as dependent variable. To offer a more comprehensive overview on the effects of geopolitics, we compare these results with those based on aggregate trade.

Finally, we address reverse causality between trade and geopolitics more rigorously by implementing an IV strategy. To do so, we propose a novel bilateral instrument which relies on country's exposure to terrorism (Enders et al., 2011; Beverelli et al., 2023).[9] Specifically, our approach involves using the absolute value of the difference in terrorism incidents between country pairs as a bilateral time-varying instrument for geopolitical distance. The motivation behind this choice is that differences in the exposure to terrorism across countries should reflect differences in countries' political system, as empirical evidence shows that authoritarian regimes experience less terrorism than democracies (Blomberg & Rosendorff, 2009; Wilson & Piazza, 2013).[10] As a result, our constructed variable should be correlated with geopolitical distance, while not affecting trade directly. While we could have used an indicator identifying differences across political systems as an instrument, none of the existing measures varies over time in the period of investigation.[11] One may argue that terrorism may affect trade flows directly: empirical evidence in favour of this argument is mixed, finding a negligible impact on international trade in the short run (Mirza & Verdier, 2014; Egger & Gassebner, 2015).[12]

We implement this strategy by adopting a control function approach to the fixed-effects PPML model as proposed by Wooldridge (1999) and Lin and Wooldridge (2019).[13] This approach consists of a two-step procedure. In the first step we obtain the residuals from a linear reduced-form regression of geopolitical distance on the instrument and other trade-cost variables. This provides a measure of differences in the exposure to terrorism between country pairs that is orthogonal to trade frictions. In the second stage we include the predicted residuals from the first step in the three-way fixed-effects PPML model specified in Equation (5). Specifically, our first-stage regression is the following:

[9] Beverelli et al. (2023) use domestic terrorism as instrument to address the endogeneity of institutions for trade.

[10] Our data largely reflect this view. As an example, Russia and China in the two most recent years for which data are available, 2020 and 2021, show a relative low number of incidents, averaging at 10 and 18, respectively. Conversely, the number of terrorist attacks registered in the US and the UK in the same period averages at 75 and 83. Furthermore, data show that terrorism incidents have been rising in the latter countries since 2012, while falling in the first. Thus, the constructed bilateral difference in terrorism incidents has been widening over time between these country pairs.

[11] See, for example, the *"Polity Score"* available from the *"Polity IV Project"* dataset, which codes and reports the state of the political system of a country ranging from +10 (strongly democratic) to -10 (strongly autocratic) over the period 1800-2018.

[12] Mirza and Verdier (2014) finds that a 1% increase in the number of bilateral terrorism incidents reduces US bilateral imports by 0.01%. Egger and Gassebner (2015) find no terrorism impact on trade of OECD countries within 1.5 years of an attack.

[13] In the gravity literature, the control function method has been first implemented by Mattoo et al. (2022) to address the endogeneity of deep trade agreements.

$$\ln\_\text{GEOP\_DIST}_{ij,t} = \sum_{T=2012}^{2022} \beta_1^T \ln\_\text{TERR\_DIST\_T}_{ij,t} + \sum_{T=2012}^{2022} \beta_k^T \text{Controls\_T}_{ij,t} + \psi_{i,t} + \theta_{j,t} + \text{u}_{ij,t}, \tag{6}$$

where $\ln\_\text{TERR\_DIST\_T}_{ij,t}$ is our IV, expressed as the absolute value of the difference in the number of terrorist incidents between country pairs, interacted with period dummies. In the vector $\text{Controls\_T}_{ij,t}$ we include bilateral time-varying regressors as in Equation (5) (tariffs, trade agreements and international border effects). The specification includes both importer-time and exporter-time fixed-effects, $\psi_{i,t}$ and $\theta_{j,t}$, respectively, while $\text{u}_{ij,t}$ is the error term. We estimate Equation (6) through OLS. Our second-stage regression takes the following form:

$$X_{ij,t} = \exp\Bigg[\sum_{T=2012}^{2022} \beta_1^T \ln\_\text{GEOP\_DIST\_T}_{ij,t-1} + \sum_{T=2012}^{2022} \beta_2^T \text{RTA\_T}_{ij,t} + \sum_{T=2012}^{2022} \beta_3^T \ln\_\text{tariff\_T}_{ij,t} + \sum_{T=2012}^{2022} \beta_4^T \text{BRDR\_T}_{ij,t} + \gamma \text{Residuals}_{ij,t} + \varphi_{i,t} + \eta_{j,t} + \mu_{ij}\Bigg] + \epsilon_{ij,t}, \tag{7}$$

which includes the residuals from the first stage and is estimated by PPML. Notice that, following Lin and Wooldridge (2019), we correct standard errors for the variation coming from the first-stage estimates.[14] As before, we present our results based on three-year averages of data.

2.2 Data

For our analysis, we rely on a panel of annual bilateral trade flows of manufacturing goods, expressed in US dollars, ranging from 2012 to 2022. We consider both aggregate trade flows and trade flows excluding energy, which are taken from Trade Data Monitor (TDM).[15] The complete trade matrix has 63 countries (trading among each other) whereas all the non-reported trade flows are filled with zeros.[16] As already mentioned, we use

[14] Specifically, we bootstrap the regression using a block-bootstrap procedure at the pair-year level with replacement (100 replications).

[15] The ultimate source for TDM is the United Nations COMTRADE database.

[16] The list of coutries is the following: Albania, Algeria, Argentina, Armenia, Australia, Belarus, Bosnia and Herzegovina, Brazil, Canada, Chile, China, Cameroon, Colombia, Georgia, Iceland, Indonesia, India,

trade flows excluding energy as our baseline. Precisely, we exclude the following inputs: coal, petroleum coke and gases. In addition to international trade flows, our estimations include intra-national (or domestic) trade flows. Domestic trade is constructed as the difference between nominal Gross Domestic Product (GDP) of the exporter and the sum of all its bilateral exports, as in Y. Yotov (2012) and more recently in Campos et al. (2021, 2023).[17] [18] Data on nominal GDP, expressed in national currency, are available from the IMF International Financial Statistics (IFS) database. These are then converted in US dollars using nominal exchange rate data, also sourced from the IFS database.[19]

Our measure of geopolitical distance is the ideal point distance proposed by Bailey et al. (2017), which is based on the UNGA voting data between 1946 and 2022. This variable, available over time and for any country pair, measures countries' foreign policy misalignment, based on their voting patterns in the UNGA. It does so by mapping the observed voting behaviours of countries into bilateral geopolitical distance measures which, loosely speaking, reflect the yearly average disagreement between any two countries in the UNGA.[20] Figure 3 plots the evolution over time of the geopolitical distance between four country pairs: US-China, US-France, Germany-China and Germany-France. As an illustration, the distance between US-France and Germany-France is relatively low, while the distance between US-China and Germany-China is consistently higher. Furthermore, the impact of the Russia-Ukraine war is clear: the geopolitical distance between Germany and China rises sharply in 2022, while the one observed between Germany and France falls almost to zero.

As instrument, we use the difference in the number of terrorist attacks between country pairs. We construct this measure based on the number of terrorist attacks at country level, as made available by the Global Terrorism database (GTD). The GTD collects data on

Israel, Japan, Kazakhstan, Mexico, Nigeria, Norway, New Zealand, Peru, Philippines, Paraguay, Qatar, Russia, Saudi Arabia, South Africa, South Korea, Switzerland, Thailand, Turkey, Ukraine, the United Kingdom, the United States, Uruguay and all the EU countries, except for Ireland, Luxembourg and Malta.

[17] The main advantage of constructing domestic flows with GDP data is the extensive time and country coverage compared with gross output data. A drawback is that GDP is measured as value added, which might be an imperfect proxy of gross output. However, Campos et al. (2021) show that gravity estimations based on domestic flows constructed using GDP data broadly converge to those obtained using gross output.

[18] When we compute domestic trade for Ireland, Luxembourg and Malta following this procedure, we obtain negative values, hence, we drop these countries from the sample.

[19] Data can be accessed at `https://data.imf.org/?sk=4c514d48-b6ba-49ed-8ab9-52b0c1a0179b&sid=1409151240976`.

[20] Based on the observed UN votes, Bailey et al. (2017) adopt an ordered logit model to estimate a time-varying measure of each country's foreign political preferences or *"ideal points"*. They show that these ideal points consistently capture the position of states vis-à-vis the US-led liberal order. The (symmetric) distance between two countries in each year is then computed as the absolute value of the difference between the respective foreign political preferences. Data can be accessed at: `https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/LEJUQZ`.

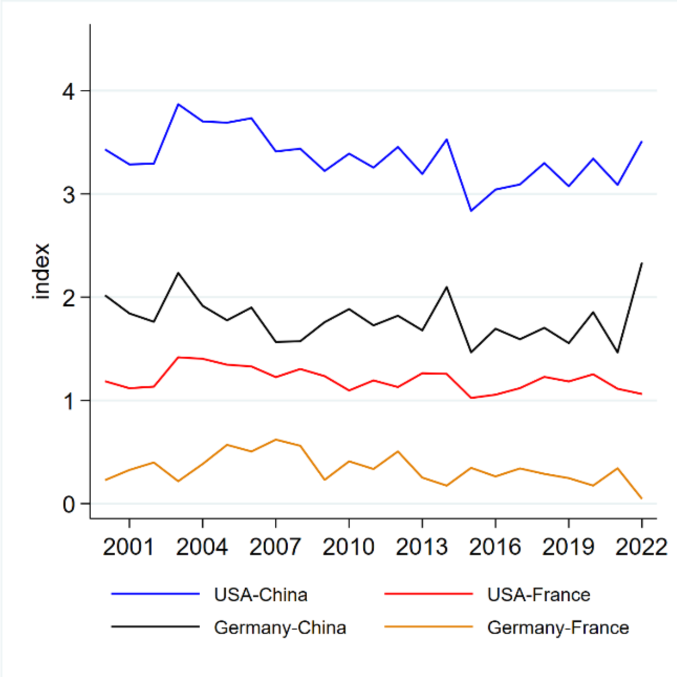

Fig. 3: Geopolitical distance between selected countries. Source: Bailey et al. (2017). Notes: Higher values mean higher geopolitical distance.

terrorism incidents from 1970 onwards and it records them drawing from media accounts indicating key variables for each terrorist attack, such as: the incident date, the victims' nationality, the number of casualties. Following a procedure implemented by Enders et al. (2011), the GTD decomposes terrorism events into domestic and transnational, i.e., international.[21] To derive our measure, we count the overall number of terrorist attacks which occur for each country and each year from 2012 to 2021.[22] Only attacks perpetrated for political, socio-economic or religious reasons are considered. Finally, we derive a time-varying measure of bilateral distance between countries' exposure to terrorism by taking the absolute (log) difference in the number of terroristic incidents between country pairs.[23] In line with our methodology and to mitigate volatility concerns in yearly terrorism flows, this variable is transformed as three-year averages.

[21] Domestic terrorism is perpetrated by a country's citizen and affects only the host or venue country, its institutions, citizens or property. The perpetrators and victims are all citizens from the venue country. A terrorist attack is international if the victim has a different nationality than the perpetrator or if the venue country is different from the victim's or perpetrator's nationality. Data are accessed at: `https://www.start.umd.edu/gtd/`.

[22] As a robustness check, we also consider international terrorism and domestic terrorism, separately. Results are broadly comparable and available upon request.

[23] Notice that the difference in terrorism incidents is set to zero for domestic trade flows.

Data on bilateral tariffs are taken from the World Integrated Trade Solution (WITS) - TRAINS database[24], whereas data on trade agreements are taken from Mario Larch's RTA database from Egger and Larch (2008).[25] Finally, we conduct some robustness experiments using the number of unilateral trade restrictions laid by countries available from the GTA database[26], and geographical distance taken from the CEPII Gravity database. [27] Descriptive statistics are presented in Table A in the Appendix.

3 Results

3.1 Geopolitical distance as a barrier to international trade

The main results of our analysis are presented in Table 1. Column (1) presents the time-varying effects of geopolitical distance and the other trade-cost variables on aggregate trade, while column (2) presents the results on trade excluding energy. From column (3) to (4) we present the results based on our IV strategy.

Column (1) shows that geopolitical distance has become a significant determinant of trade flows and its impact has steadily increased over time. The elasticity of geopolitical distance turns first negative and significant in 2015-17, aligning with Brexit, the war in Crimea and the beginning of tensions between the United States and China. Thereafter, the elasticity retains the negative sign and increases in magnitude, as the tariff war escalated and pre-existing trade tensions were met by the turmoil spread by the Covid-19 pandemic.[28] This trend peaks in 2021-22 at -0.25, when Russian invasion of Ukraine further shocked global trade flows.

The impact of geopolitical distance is economically significant: a 10% increase (like the observed increase in the US-China geopolitical distance since 2018) is found to hamper trade flows by 2.5%. Compared to traditional trade-cost variables, a decrease in geopolitical distance by one standard deviation yields a third of the trade effect exerted by the average trade agreement.[29] Furthermore, the estimated elasticity of geopolitical

[24] Data can be accessed at: `https://wits.worldbank.org/WITS/WITS/Restricted/`.

[25] See `https://www.ewf.uni-bayreuth.de/en/research/RTA-data/index.html`. We use version: *rta_20221214.dta*.

[26] The GTA database documents all unilateral changes in the relative treatment of foreign versus domestic commercial interests. Only interventions that the GTA deems "certain to discriminate against foreign commercial interests" are included. Data can be accessed at: `https://www.globaltradealert.org/`.

[27] Data can be accessed at: `http://www.cepii.fr/cepii/en/bdd_modele/bdd_modele_item.asp?id=8`.

[28] Precisely, on March 1 2018, Trump administration announced 25 percent tariffs on imports of steel and 10 percent tariffs on imports of aluminium. See Bown (2021).

[29] Following Head and Mayer (2014), this effect is given by the ratio between the coefficients of

distance can be compared to the benchmark gravity estimates of the effect of geographical distance, which is the most common proxy of trade costs in the gravity literature and it is typically found to have an elasticity of about -1 (Disdier & Head, 2008; Head & Mayer, 2014). Our estimates assume even greater relevance in a forward-looking perspective, given that empirical evidence shows a falling effect of geographical distance over time (Y. Yotov, 2012; Borchert & Yotov, 2017), whereas we find a growing effect of geopolitical distance.

Column (2) presents the results excluding energy from trade flows. Estimates become significant with one-period lag, precisely from the 2018-20 period. The monotonic increase in geopolitical distance (in absolute value) over time is preserved, albeit with a lower magnitude. This likely reflects the historical tendency of energy-exporting countries to use energy and mineral fuels as a political instrument during periods of heightened geopolitical tensions (Baran, 2007; Van de Graaf & Sovacool, 2020). Precisely, our estimates indicate that a 10% increase in geopolitical distance in 2021-22 reduces trade flows (excluding energy) by about 2%.

Tariffs are found to have a negative but weak impact on trade, at least on average.[30] This is consistent with evidence (see also Figure 2) showing that alternative trade-inhibiting measures have been on the rise. Notice that, when energy is excluded from trade flows, tariffs turn positive and significant in 2021-22, which reflects that the strong rebound observed in trade likely offsets the negative effect of a tariff increase on commodities, particularly food, during the Russian war.[31] To provide further intuitions, we compare the estimated time-varying elasticity of both geopolitical distance and tariffs using consecutive years in Figure A in the Appendix and we show that tariffs are not an important determinant of trade flows in the last decade. Conversely, trade agreements exert a positive effect on trade flows during the whole period, in line with the existing literature (Baier et al., 2014, 2019). Furthermore, the effect is found to increase over time, likely reflecting the trade enhancing impact of newly signed agreements, such as the Regional Comprehensive Economic Partnership (RCEP). [32]

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geopolitical distance and the trade agreement indicator multiplied by the logarithm of the standard deviation of geopolitical distance.

[30] The average impact of tariffs, obtained without interacting gravity variables with period dummies, is found to be not significant. Results are shown in Table B in the Appendix.

[31] See, for instance, the resolution adopted by the EU council `https://www.consilium.europa.eu/it/press/press-releases/2024/05/30/council-sets-higher-tariffs-on-russian-and-belarusian-grain-products/`.

[32] The RCEP involves Australia, Brunei, Cambodia, China, Indonesia, Japan, South Korea, Laos, Malaysia, Myanmar, New Zealand, the Philippines, Singapore, Thailand, and Vietnam and accounts for about 30% of global GDP. See: `https://asia.nikkei.com/Economy/Trade/India-stays-away-from-RCEP-talks-in-Bali`, `https://www.scmp.com/news/china/diplomacy/article/3109436/what-rcep-and-what-does-indo-pacific-free-trade-deal-offer`.

Columns (3) and (4) replicate previous results by implementing an IV strategy, where we instrument geopolitical distance with our constructed bilateral measure of differences in terrorism incidents between countries. As already stated, we adopt a control function approach to the fixed-effects PPML model. Our results show that our instrument is a strong predictor of geopolitical distance, according to the *F-statistics*.[33] The estimates are slightly smaller in magnitude compared to column (1), yet they provide further evidence on the increasing importance of geopolitical distance on international trade over time.[34] Specifically, results from the second-stage regression in column (3) for aggregate trade largely confirm those in column (1): an increase in geopolitical distance by 10% in the last period is found to reduce trade by 2.2%. As before, estimates of trade flows excluding energy (column (4)) retain high significance levels and the negative sign. Importantly, these results strongly converge to those in column (2), suggesting that the exclusion of energy is sufficient to rule out endogeneity. This is further confirmed when we compare the coefficient on first-stage residuals in column (3) vis-à-vis column (4). When we consider aggregate trade, the coefficient is significantly different from zero, suggesting that geopolitical distance could suffer from endogeneity. Conversely, the residuals based on trade excluding energy lose significance, implying that geopolitical distance is exogenous conditional on the fixed effect. In the rest of the paper, we use trade excluding energy as dependent variable and we regard the specification in column (2) as our baseline.

We conduct several robustness checks in Table 2, using bilateral trade flows excluding energy as dependent variable. In column (1), we replicate the same analysis as in column (2) in Table 1 using consecutive years, which confirms our previous findings. In column (2), we account for the effect of the EU trade integration across countries over time.[35] As expected, the effect of geopolitical distance slightly decreases in magnitude and becomes significant with one-period lag, reflecting the high degree of policy alignment across EU members. Furthermore, the effect of trade agreements shrinks, due to EU countries' accession to the Single Market, which is expected to be different from the average border effect. In column (3), we follow Bergstrand et al. (2015) and include an interaction term between the logarithm of bilateral geographical distance and period dummies to test whether the growing impact of geopolitical distance on trade is masking deglobalisation effects. We find little variation in our estimates.

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[33] The magnitude of the *F-statistics* suggests that the weak instrument bias is unlikely to occur in our analysis. See for example Staiger and Stock (1997).

[34] Notice that standard errors are larger in both columns (3) and (4), indicating that our panel bootstrap procedure leads to a more conservative inference.

[35] We follow Spornberger (2022) and interact time-varying border dummy variables with an indicator for trade within the EU. The compound term $\text{BRDR\_EU}_{ij,t}$ has time variation and captures the changing border effects within the EU due to a country's accession to the Single Market.

and the US have been particularly prominent in recent years. Macroeconomic aggregates already seem to point to a sharp decoupling in trade between the US and China – for example, the share of US imports from China declined from 22% in 2016 to 16% in 2022 (Freund et al., 2023). When the US is dropped from the sample (column (4)), the effect of geopolitical distance is still statistically significant, albeit smaller and one-period lagged. Even tough the US appears to be an important driver of the increasing importance of geopolitical distance over time, our results point to a broader reshape of cross-country trade patterns driven by geopolitical forces and not exclusively by the US. Consistently, Fajgelbaum et al. (2024) show that the decoupling between the US and China does not lead to lower levels of trade overall, rather to trade diversion effects which benefit third countries.

A potential concern is that our results may suffer from an omitted variables bias since non-tariff barriers (subsidies, import bans, export restrictions, etc.) would influence bilateral trade while being correlated with geopolitical distance at the same time. Since data on non-tariffs barriers are limited and difficult to transform into bilateral measures, we address this issue in column (5) by adding an index of unilateral trade restrictions in the spirit of Campos et al. (2023) to Equation (5).[36] Results show that our measure of unilateral restrictions becomes negative and gains statistical significance in 2021-22, reflecting the recent rise in the use of inward-looking policies. When this additional control is included, the estimates of geopolitical distance decrease in magnitude but remain statistically significant. This suggest that the impact of geopolitical distance goes beyond the effect of unilateral trade measures, thus capturing the desire of firms to diversify their suppliers to reduce exposure to adverse shocks.

We run further robustness checks in Table B in the Appendix in which we replicate the results in Table 1 using consecutive years. The variable geopolitical distance is now interacted with year dummy variables. The rise in the elasticity is confirmed and the magnitude in the four specifications is broadly in line with previous estimates. The control function approach yields similar results, further confirming that geopolitical distance is exogenous (conditional on the fixed effects) when we use trade excluding energy as dependent variable. Furthermore, the use of yearly data enables us to examine the exact timing when geopolitics starts to feed in trade flows. Focusing on our preferred specification in column (2), we witness that geopolitical distance turns first negative and significant in 2019, broadly at the time that trade disputes between the US and China intensified.

[36] Precisely, following Heid et al. (2021) and (Beverelli et al., 2023), we interact an international border dummy variable with the number of unilateral trade restrictions (in log) imposed by the exporter every year from 2012 to 2022 and taken from the GTA database. Consistently, we take three-year averages. For domestic trade flows, the constructed variable $\text{ln\_RESTRICTIONS\_T}_{ij,t}$ equals zero, meaning that it is not collinear with country-time fixed effects.

3.2 The heterogeneity of geopolitics: advanced vis-à-vis emerging economies

Next, we investigate the heterogeneity of the impact of geopolitical distance on trade patterns across countries. The rise in geopolitical distance elasticities over time, as documented in Table 1, captures the effect of increased trade restrictions in key strategic sectors associated to the Covid-19 pandemic crisis, economic sanctions imposed to Russia, as well as the rise of import-substituting industrial policies. Besides these policy-driven factors, heightened trade policy uncertainty acts as an additional barrier to trade (Handley & Limão, 2022). An intriguing question is which (groups of) countries have been driving this trend. Survey data, as well as foreign direct investment announcements, indicate that firms in some AEs have been accelerating reshoring and investing more in their countries or regions to reduce vulnerabilities linked to geopolitical risks and trade policy shocks (Aiyar et al., 2024; Freund et al., 2023). New evidence shows that the recent wave of industrial policies and trade-distorting corporate subsidies is primarily driven by AEs, with strategic competitiveness being the dominant motive behind these measures (Evenett et al., 2024). All these arguments point to a higher sensitivity over time of AEs' trade to geopolitical distance compared to EMDEs.

We test this argument by allowing for a differential impact of geopolitical distance on trade of AEs and EMDEs.[37] We interact geopolitical distance with a dummy variable such that the exporter is an advanced country trading with the rest of the world and with a dummy such that the importer is an advanced country trading with the rest of the world, respectively.[38] To build our dummies we partition between exporters and importers in order to grasp a better intuition about the heterogeneity of the effect. Since our main goal is to provide evidence on the growing importance of geopolitical distance for international trade, the new constructed term is then interacted with time. The results are presented in Table 3. We adopt the same framework as in Equation (5), estimated by PPML, based on three-year averages of data and we use trade excluding energy as dependent variable. Estimates should be interpreted as deviations from the omitted category.

Estimates in column (1) reveal a significant differential effect of geopolitical distance on exports of AEs versus EMDEs. The interaction term shows negative and significant coefficients throughout the whole sample, meaning that AEs' exports are affected by geopolitical distance significantly more. In line with our previous results, the impact

[37] Following the World Economic Outlook (WEO) distinction between AEs and EMDEs, we label Australia, Israel, Japan, Norway, New Zealand, South Korea, Switzerland, UK, USA and EU countries as AEs. All remaining countries are labelled as EMDEs.

[38] Due to perfect multicollinearity, it is not possible to identify at the same time both the effect of exports of AEs (to any country) and the effect of exports of EMDEs (to any country). The same reasoning applies to imports.

of geopolitical distance magnifies in the 2021-22 period. At the same time, these findings likely reflect pre-existing differences in trends observed between the two groups of countries due to the decreasing importance of AEs in global trade, as opposed to EMDEs, following the sluggish post-global financial crisis recovery in exports of AEs (Constantinescu et al., 2015; OECD, 2017; Baldwin, 2022).

Findings from column (2) are of particular note: whilst we do not find significant asymmetries in the impact of geopolitical distance on imports of AEs versus imports of EMDEs until 2020, the coefficient of the interaction term turns negative and significant in the most recent period. As a result, imports of AEs appear to have become more reoriented along geopolitical lines since the onset of the Covid-19 pandemic and the Russian war. Beyond capturing the longer-term decline in China's share of US imports, these estimates support our hypothesis that the recent rise in the use of inward-looking policies by AEs, as well as the desire of firms to diversify their sources to reduce exposure to adverse shocks, is reflected in the increased sensitivity of AEs' imports to geopolitical distance. Importantly, strategic products appear to drive this trend (Bosone et al., 2024).[39]

Figure 4 provides further insights on the heterogeneity of the effect of geopolitics on trade. Precisely, it correlates the estimated geopolitical distance elasticities of imports at the country level for the most recent period of our sample, i.e., ln_GEOP_DIST_imp_2021-22, with an indicator of economic development, i.e., per capita income. The negative correlation is clearly visible (coefficient of -0.39) and most AEs report negative and significant estimates, in line with the conjecture that richest countries have been reorienting their imports along geopolitical lines. Interestingly, the effects of geopolitical distance are quite heterogeneous across countries. Israel, Iceland and Saudi Arabia record the strongest impact (-0.6), followed by AEs such as the United Kingdom, the United States, Canada, South Korea and Japan (-0.4). Conversely, positive estimates are found for EMDEs such as Brazil, Mexico, Paraguay and Colombia. Overall, the effect of geopolitical distance is found to be heterogeneous across different levels of economic development and high-income countries show higher sensitivity.

3.3 Friend-shoring vs. near-shoring

Recent narratives surrounding trade reconfiguration and economic interdependence increasingly argue for localisation of supply chains through near-shoring and strengthening production networks with like-minded countries through friend-shoring (Yellen, 2022). In particular, references to these trends have been on the rise in companies' earning calls

[39] The empirical evidence provided by Bosone et al. (2024) shows that the European Union has undertaken a selective decoupling in trade in strategic products since the onset of the Covid-19 pandemic by reducing its dependency on geopolitically distant suppliers in sectors such as military equipment, raw materials, battery packs, high-tech and medical goods.

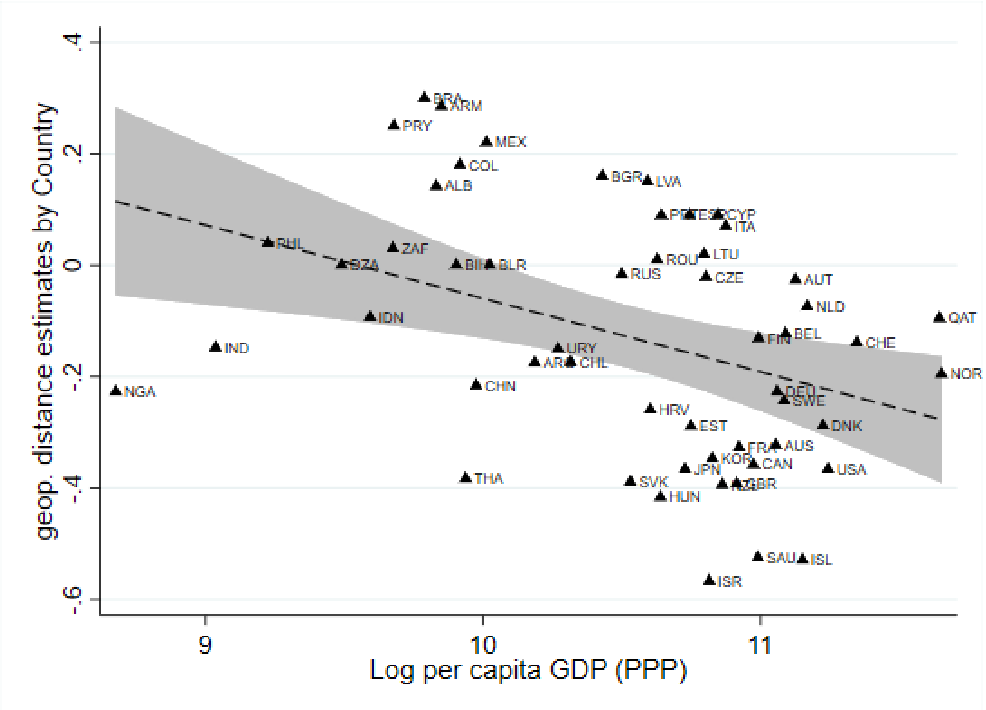

Fig. 4: Country-specific coefficients of geopolitical distance on imports and per capita income. Notes: This graph shows geopolitical distance elasticities of imports in the period 2021-22 at the country level and log per capita GDP in nominal US dollars. The underlying country-specific estimates are obtained from a gravity specification based on three-year averages of data, with time-varying gravity variables as in eq. (5), exporter-time, importer-time and exporter-importer fixed effects. The dependent variable is nominal bilateral trade excluding energy. Estimates are obtained using the PPML estimator. Ukraine excluded.

since 2018 (Alfaro & Chor, 2023), broadly aligning with the period when we first find estimates to be significant in our baseline (see Table 1). Our aim in this section is to offer quantitative evidence of friend-shoring and near-shoring in the post-2018 period.

To investigate friend-shoring trends, we proceed by regressing bilateral trade flows (excluding energy) on a set of four dummy variables that identify the four quartiles of the distribution of geopolitical distance across country pairs. We test the following equation:

$$X_{ij,t} = \exp\left[\beta_1 \text{BRDR\_FRIENDS}_{ij,t} + \beta_2 \text{BRDR\_CLOSE}_{ij,t} + \beta_3 \text{BRDR\_DISTANT}_{ij,t} + \beta_4 \text{BRDR\_RIVALS}_{ij,t} + \gamma \text{Controls}_{ij,t} + \varphi_{i,t} + \eta_{j,t} + \mu_{ij}\right] + \epsilon_{ij,t}, \quad (8)$$

where the four quartiles are: $FRIENDS$, $CLOSE$, $DISTANT$ and $RIVALS$. To capture the effect of growing geopolitical tensions on trade, each dummy is equal to 1 for country pairs trading within the same quartile from 2018 and zero otherwise. Following recent advances in the gravity literature (Heid et al., 2021; Beverelli et al., 2023), each dummy is then interacted with the indicator variable BRDR that takes value 1 for international trade and zero for domestic trade. Since these interaction terms take value zero for internal sales, their impact can be identified for each quartile even in the presence of exporter-time and importer-time fixed effects, $\varphi_{i,t}$ and $\eta_{j,t}$, which apply to both international and domestic sales.[40] The coefficient of interest is the one on the interaction term BRDR_FRIENDS, that is β_1. It captures friend-shoring trends on international trade (relative to domestic trade) since 2018. μ_{ij} in Equation (8) denotes country-pair fixed effects and the vector $\text{Controls}_{ij,t}$ includes geopolitical distance, tariffs, the trade agreement indicator and a dummy variable for each quartile spanning over the entire period to control for pre-existing trends in trade flows within groups. Finally, $\epsilon_{ij,t}$ is a remainder error term.

Figure 5, panel a), shows the differential impact of belonging to a specific quartile on international trade (relative to domestic trade) since 2018.[41] Our estimates provide strong evidence of friend-shoring. This is suggested by the fact that trade between geopolitically aligned countries has increased by more than 6% since 2018, compared to the period 2012-17.[42] Conversely, trade within $rivals$ is found to decline by about

[40] The inclusion of country-time fixed effects in a gravity specification which includes only international trade flows would pose collinearity challenges making it impossible to identify the impact of all quartile dummy variables considered together.

[41] Precisely, we allow country pairs to switch quartile over time following variations in the index of geopolitical distance. In Figure B in the Appendix, panel b), we keep the quartile composition fixed as it was in 2018.

[42] The effect on trade for friends is given by the semi-elasticity of: (exp(0.062)– 1)*100=6.4%. In Figure

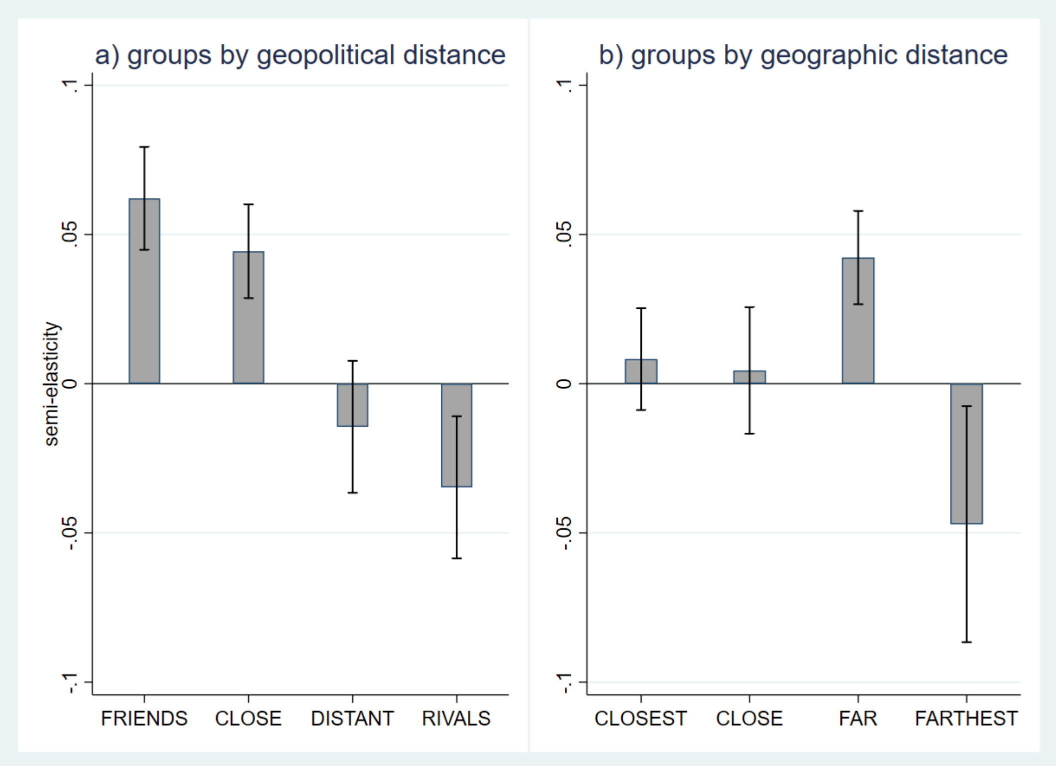

Fig. 5: Effect of trading within geopolitical groups (left) and geographic groups (right) since 2018. Notes: Bars represent the estimated semi-elasticity of trade to country groups according to their geopolitical distance (left) and to geographic distance (right). The whiskers represent 95% confidence bands. Estimates in both panels are obtained by PPML on the sample period 2012-2022 using consecutive years and controlling for bilateral time-varying variables, exporter-time fixed effects, importer-time fixed effects and exporter-importer fixed effects. In the left-hand side panel we also control for pre-existing trends in trade flows within groups. The dependent variable is nominal bilateral trade excluding energy.

4% since 2018, compared to the previous period. Overall, we document significant asymmetries in our gravity estimates by quartile. These results are largely confirmed in Figure B in the Appendix, panel b), where the quartiles composition is kept fixed over time. This confirms that it is not a specific antagonism between country pairs to drive our estimates, rather a widespread growth in the weight of geopolitical considerations in trade patterns.

To explore near-shoring, we use the same specification as in Equation (8) except that our main regressors are now four dummy variables identifying the quartiles of country pairs according to their geographic distance: $CLOSEST$, $CLOSE$, FAR and

B in the Appendix, panel b), this effect is even stronger and equal to: (exp(0.0.089)– 1)*100=9.3%. Our estimates rule out the possibility of heterogeneous pre-existing trends in trade within each country-group.

$FARTHEST$.[43] Results are show in in Figure 5, panel b). Our estimates do not reveal evidence of near-shoring. We instead find a significant increase in trade between far country pairs, offset by a relatively similar decline in trade between farthest country pairs. Overall, our results suggest that trade reconfiguration is materialising along geopolitical lines, driven by friend-shoring strategies.

4 Conclusions

Rising tensions, a spate of trade-inhibiting policy measures and a weakening of multilateral institutions have cast doubts about trade resilience. This has spurred a growing interest on the implications of trade fragmentation along geopolitical lines. In this paper, we provide new empirical evidence on the impact of geopolitical distance on international trade.

Based on a state-of-the-art gravity model, our findings point to a redistribution of global trade flows driven by geopolitical forces, reflected in the increasing importance of geopolitical distance as a barrier to trade. Motivated by the recent use of energy flows as a political leverage by opposing countries, we use results based on trade excluding energy as our baseline. The impact of geopolitical distance is economically sizeable: a 10% increase, like the observed rise in the distance between the US and China since 2018, hampers trade flows by about 2%. We explicitly address the endogeneity of geopolitics and trade by implementing an IV strategy, relying on a novel instrument based on the difference in terrorism incidents between country pairs. Importantly, IV estimates converge to our baseline estimates, suggesting that the exclusion of energy allows to rule out endogeneity concerns.

Our findings also suggest that AEs show higher sensitivity to geopolitical distance over time, particularly their imports, compared to EMDEs, reflecting a massive use of inward-looking policies, such as trade-distorting subsidies and restrictions in key-strategic sectors. Furthermore, we provide compelling evidence that the geopolitical reconfiguration of trade is being driven by friend-shoring, rather than near-shoring. This scheme highlights the emergence of new forces, which are no longer based on profit-oriented strategies alone, but also on geopolitical alignment. However, friend-shoring strategies, coupled with efforts to promote reindustrialisation, encompass a trade-off between risk minimisation and cost efficiency. Such costs, reflected in reduced competition, a loss of specialization and weaker economies of scale, would increasingly weigh on this trade-off, as trade fragmentation deepens and countries face severe losses in terms of reduced trade and welfare. Furthermore, a deepening of fragmentation would also inhibit efforts to address other global challenges, from climate change and green

[43] Again, each dummy is interacted with the indicator variable BRDR and it equals 1 for trade within the same quartile from 2018.

transition to an efficient regulatory framework in both trade and the global payment system.

This paper uses aggregate bilateral trade flows. As a further line of research, industry-level gravity estimates would provide a more detailed analysis on the impact of geopolitical tensions across different sectors. Given the impressive rate at which services are growing as a share of global trade, it may be worth expanding our analysis beyond manufacturing goods. Finally, the analysis could be extended to investigate the impact of fragmentation on trade in critical raw materials through the use of highly disaggregated data.

Tab. 1: Effect of geopolitical distance on trade - Main estimates

	Panel A: PPML		Panel B: Control function	
	(1) aggregate	(2) excl. energy	(3) aggregate	(4) excl. energy
ln_GEOP_DIST_2012-14	-0.032	0.052	0.003	0.055
	(0.051)	(0.056)	(0.075)	(0.083)
ln_GEOP_DIST_2015-17	-0.094**	-0.006	-0.054	0.004
	(0.045)	(0.047)	(0.061)	(0.070)
ln_GEOP_DIST_2018-20	-0.157***	-0.087*	-0.124**	-0.083
	(0.043)	(0.046)	(0.058)	(0.066)
ln_GEOP_DIST_2021-22	-0.250***	-0.187***	-0.224***	-0.180***
	(0.043)	(0.046)	(0.055)	(0.060)
ln_tariff_2012-14	-0.006	-0.007	-0.009	-0.002
	(0.013)	(0.013)	(0.016)	(0.019)
ln_tariff_2015-17	-0.031***	-0.022***	-0.033***	-0.018
	(0.008)	(0.008)	(0.012)	(0.014)
ln_tariff_2018-20	-0.015*	-0.011	-0.020*	-0.011
	(0.008)	(0.008)	(0.012)	(0.011)
ln_tariff_2021-22	0.020	0.027*	0.020	0.029*
	(0.014)	(0.014)	(0.017)	(0.016)
RTA_2012-14	0.116***	0.128***	0.152**	0.141***
	(0.034)	(0.035)	(0.061)	(0.053)
RTA_2015-17	0.144***	0.150***	0.178***	0.164***
	(0.027)	(0.027)	(0.047)	(0.043)
RTA_2018-20	0.132***	0.141***	0.166***	0.153***
	(0.028)	(0.027)	(0.036)	(0.041)
RTA_2021-22	0.175***	0.181***	0.205***	0.195***
	(0.027)	(0.027)	(0.040)	(0.049)
First-stage residual			-0.115**	-0.040
			(0.051)	(0.046)
F-stat of the excluded instrument			38.35	38.35
BRDR_time	yes	yes	yes	yes
Exporter-time FEs	yes	yes	yes	yes
Importer-time FEs	yes	yes	yes	yes
Country-pair FEs	yes	yes	yes	yes
Observations	14,775	14,775	13,588	13,588

Notes: This table reports estimates of the effect of geopolitical distance on trade. The dependent variable is nominal bilateral trade in columns (1) and (3), and it is nominal bilateral trade excluding energy in columns (2) and (4). The sample period is 2012-2022, with three-year averages of data. Estimates in columns (1) and (2) are obtained by PPML. Estimates in columns (3) and (4) are obtained using the control function. Estimates of the constant, fixed effects and time-varying international border dummies are omitted for brevity. Also, first-stage estimates are omitted. The F-stat refers to Montiel-Pflueger robust weak instrument test. In column (1) and (2) we report in parenthesis clustered standard errors at the pair-time level. In columns (3) and (4) we report in parenthesis block-bootstrapped standard errors (100 reps.) at the pair-time level. Respectively, *, **, and *** denote significance at the level of 10%, 5%, and 1%.

Tab. 2: Effect of geopolitical distance on trade - Robustness test

	(1) consecutive years	(2) EU integration over time	(3) distance*time	(4) excl. USA	(5) unilateral restrictions
ln_GEOP_DIST_2012-14	0.037	0.060	0.071	0.085	0.036
	(0.046)	(0.067)	(0.055)	(0.052)	(0.050)
ln_GEOP_DIST_2015-17	0.013	0.010	0.017	-0.020	-0.010
	(0.033)	(0.057)	(0.045)	(0.042)	(0.045)
ln_GEOP_DIST_2018-20	-0.104***	-0.071	-0.071*	-0.059	-0.086**
	(0.037)	(0.054)	(0.041)	(0.041)	(0.044)
ln_GEOP_DIST_2021-22	-0.182***	-0.156***	-0.172***	-0.119***	-0.168***
	(0.040)	(0.059)	(0.045)	(0.042)	(0.042)
ln_tariff_2012-14	0.003	-0.025*	-0.000	-0.008	-0.001
	(0.012)	(0.015)	(0.015)	(0.012)	(0.013)
ln_tariff_2015-17	-0.024***	-0.026***	-0.022***	-0.026***	-0.029***
	(0.007)	(0.009)	(0.008)	(0.008)	(0.008)
ln_tariff_2018-20	-0.017**	-0.016*	-0.010	-0.024***	-0.011
	(0.008)	(0.009)	(0.008)	(0.008)	(0.007)
ln_tariff_2021-22	0.036***	0.044***	0.023**	0.016*	0.026***
	(0.010)	(0.013)	(0.010)	(0.009)	(0.009)
RTA_2012-14	0.112***	0.118***	0.099***	0.152***	0.143***
	(0.032)	(0.042)	(0.033)	(0.035)	(0.035)
RTA_2015-17	0.156***	0.135***	0.117***	0.160***	0.157***
	(0.024)	(0.031)	(0.027)	(0.028)	(0.028)
RTA_2018-20	0.133***	0.126***	0.124***	0.143***	0.144***
	(0.024)	(0.032)	(0.026)	(0.029)	(0.028)
RTA_2021-22	0.178***	0.158***	0.184***	0.187***	0.173***
	(0.026)	(0.034)	(0.027)	(0.030)	(0.028)
ln_RESTRICTIONS_2012-14					0.006
					(0.018)
ln_RESTRICTIONS_2015-17					-0.008
					(0.019)
ln_RESTRICTIONS_2018-20					-0.016
					(0.016)
ln_RESTRICTIONS_2021-22					-0.041**
					(0.019)
BRDR_time	yes	yes	yes	yes	yes
Exporter-time FEs	yes	yes	yes	yes	yes
Importer-time FEs	yes	yes	yes	yes	yes
Country-pair FEs	yes	yes	yes	yes	yes
Observations	40,298	14,775	14,775	14,290	14,542

Notes: This table reports estimates of the effect of geopolitical distance on international trade. The dependent variable is nominal bilateral trade excluding energy. The sample period is 2012-2022. Estimates in columns (1) are obtained using consecutive years and coefficient estimates refer to 2013, 2016, 2019 and 2022. Estimates in the remaining columns are based on three-year averages of data. Estimates are obtained by PPML. Estimates of the constant, fixed effects, time-varying EU integration effects, distance*year interactions and time-varying international border dummies are omitted for brevity. Standard errors are clustered by country-pair and time. Respectively, *, **, and *** denote significance at the level of 10%, 5%, and 1%.

Tab. 3: Effect of geopolitical distance on trade flows by level of economic development

	(1)	(2)
RTA	0.165***	0.178***
	(0.030)	(0.030)
ln_tariff	-0.006	-0.006
	(0.008)	(0.008)
ln_GEOP_DIST_AEexp_2012-14	-0.325***	
	(0.099)	
ln_GEOP_DIST_AEexp_2015-17	-0.190*	
	(0.103)	
ln_GEOP_DIST_AEexp_2018-20	-0.203**	
	(0.092)	
ln_GEOP_DIST_AEexp_2021-22	-0.433***	
	(0.101)	
ln_GEOP_DIST_AEimp_2012-14		0.011
		(0.093)
ln_GEOP_DIST_AEimp_2015-17		0.135
		(0.098)
ln_GEOP_DIST_AEimp_2018-20		0.067
		(0.091)
ln_GEOP_DIST_AEimp_2021-22		-0.197**
		(0.098)
BRDR_time	yes	yes
Exporter-time FEs	yes	yes
Importer-time FEs	yes	yes
Country-pair FEs	yes	yes
Observations	14,775	14,775

Notes: This table reports estimates of the differential effect of geopolitical distance on trade of advanced and emerging economies. The dependent variable is nominal bilateral trade excluding energy. The sample period is 2012-2022, with three-year averages of data. All estimates are obtained using the PPML estimator. Estimates of the constant, fixed effects and time-varying international border dummies are omitted for brevity. Standard errors are clustered by country-pair and year. Respectively, *, **, and *** denote significance at the level of 10%, 5%, and 1%.

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Appendix

Tab. A: Descriptive statistics

	N	Mean	SD	Min	Max
Nominal aggregate trade (million US dollar)	43659	7661.9	345789.3	0	23149709
if $i \neq j$	42966	3402.1	16180.9	0	539996.9
if $i = j$	93	901723	2594627	2472.2	23149709
Nominal trade excluding energy (million US dollar)	43659	17273.9	345752.1	0	23069703
if $i \neq j$	42966	2574.4	12885.7	0	510476
RTA	43659	0.5	0.5	0	1
Ideal point distance	43659	0.9	0.8	0	3.9
Tariff (%)	40405	5.1	7.1	0	115
Difference in (logarithm) terrorism incidents	37210	2.0	1.7	0	6.8
New imposed trade restrictions (logarithm)	42284	3.2	1.5	0	7.3

Sources: TDM, IMF, Bailey et al. (2017), Egger and Larch (2008), WITS-TRAINS, Bailey et al. (2017), GTA and GTD. Notes: Descriptives refer to annual observations. We miss data on terrorism incidents for Romania and Slovakia, while we miss data on trade restrictions for Bosnia and Herzegovina.

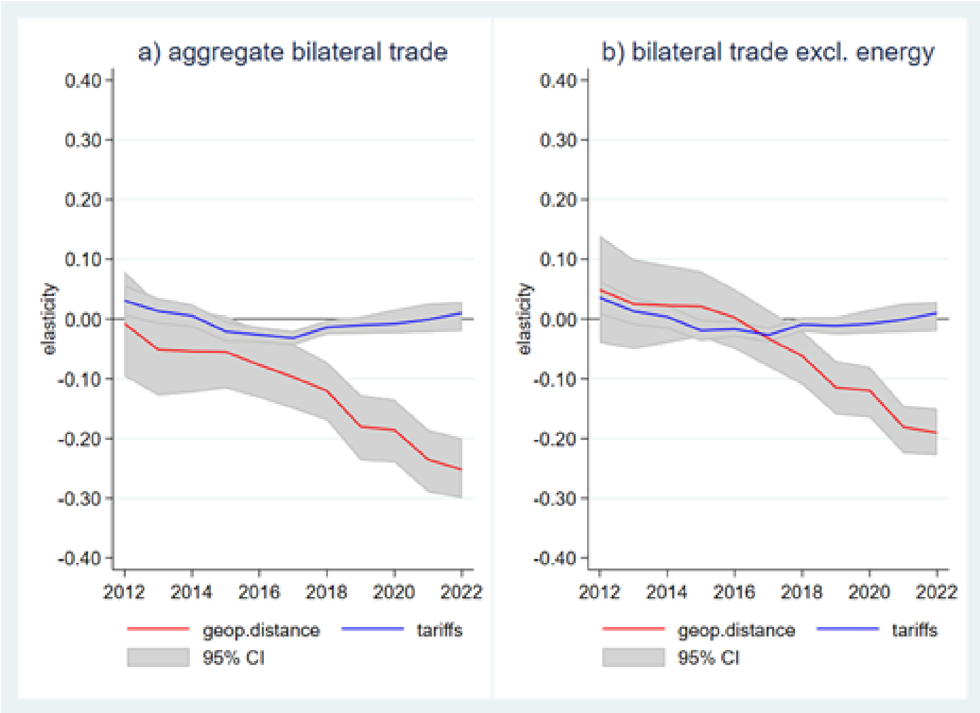

Fig. A: Time-varying gravity elasticities of geopolitical distance and tariffs. Geopolitical distance between selected countries. Notes: The dependent variable is nominal aggregate trade (left) and nominal trade excluding energy (right). Estimates are based on Equation (5).

Tab. B: Effect of geopolitical distance on trade - Robustness test with consecutive years

	Panel A: PPML		Panel B: Control function	
	(1) aggregate	(2) excl. energy	(3) aggregate	(4) excl. energy
ln_GEOP_DIST_2013	-0.045	0.037	0.038	0.070
	(0.043)	(0.046)	(0.082)	(0.087)
ln_GEOP_DIST_2014	-0.053	-0.030	0.022	0.058
	(0.040)	(0.041)	(0.072)	(0.075)
ln_GEOP_DIST_2015	-0.045	-0.031	-0.021	0.023
	(0.036)	(0.036)	(0.064)	(0.069)
ln_GEOP_DIST_2016	-0.065*	-0.013	-0.054	-0.006
	(0.034)	(0.033)	(0.068)	(0.073)
ln_GEOP_DIST_2017	-0.090**	-0.026	-0.083	-0.049
	(0.035)	(0.036)	(0.068)	(0.074)
ln_GEOP_DIST_2018	-0.107***	-0.053	-0.080	-0.060
	(0.033)	(0.033)	(0.069)	(0.076)
ln_GEOP_DIST_2019	-0.166***	-0.104***	-0.134**	-0.110*
	(0.037)	(0.037)	(0.062)	(0.066)
ln_GEOP_DIST_2020	-0.167***	-0.109***	-0.106*	-0.074
	(0.036)	(0.037)	(0.057)	(0.064)
ln_GEOP_DIST_2021	-0.219***	-0.170***	-0.172***	-0.153**
	(0.037)	(0.041)	(0.065)	(0.075)
ln_GEOP_DIST_2022	-0.241***	-0.182***	-0.189***	-0.154**
	(0.039)	(0.040)	(0.057)	(0.063)
RTA	0.166***	0.169***	0.201***	0.187***
	(0.020)	(0.019)	(0.039)	(0.043)
ln_tariff	-0.004	0.001	-0.009	0.001
	(0.004)	(0.004)	(0.005)	(0.005)
First-stage residual			-0.103**	-0.023
			(0.045)	(0.037)
F-stat of the excluded instrument			79.67	79.67
BRDR_year	yes	yes	yes	yes
Exporter-year FEs	yes	yes	yes	yes
Importer-year FEs	yes	yes	yes	yes
Country-pair FEs	yes	yes	yes	yes
Observations	40,298	40,298	39,690	39,690

Notes: This table replicates the results of Table 1 in the main text using consecutive years. The dependent variable is nominal bilateral trade in columns (1) and (3), and it is nominal bilateral trade excluding energy in columns (2) and (4). The sample period is 2012-2022. Estimates in columns (1) and (2) are obtained using the PPML estimator. Estimates in columns (3) and (4) are obtained using the control function approach. Both geopolitical distance and the instrument are one-year lagged. Estimates of the constant, fixed effects and time-varying international border dummies are omitted for brevity. Also, first-stage estimates are omitted. The F statistics refers to Montiel-Pflueger robust weak instrument test. In columns (1) and (2) we report in parenthesis clustered standard errors at the pair-year level. In columns (3) and (4) we report in parenthesis block-bootstrapped standard errors (100 reps.) at the pair-year level. Respectively, *, **, and *** denote significance at the level of 10%, 5%, and 1%.

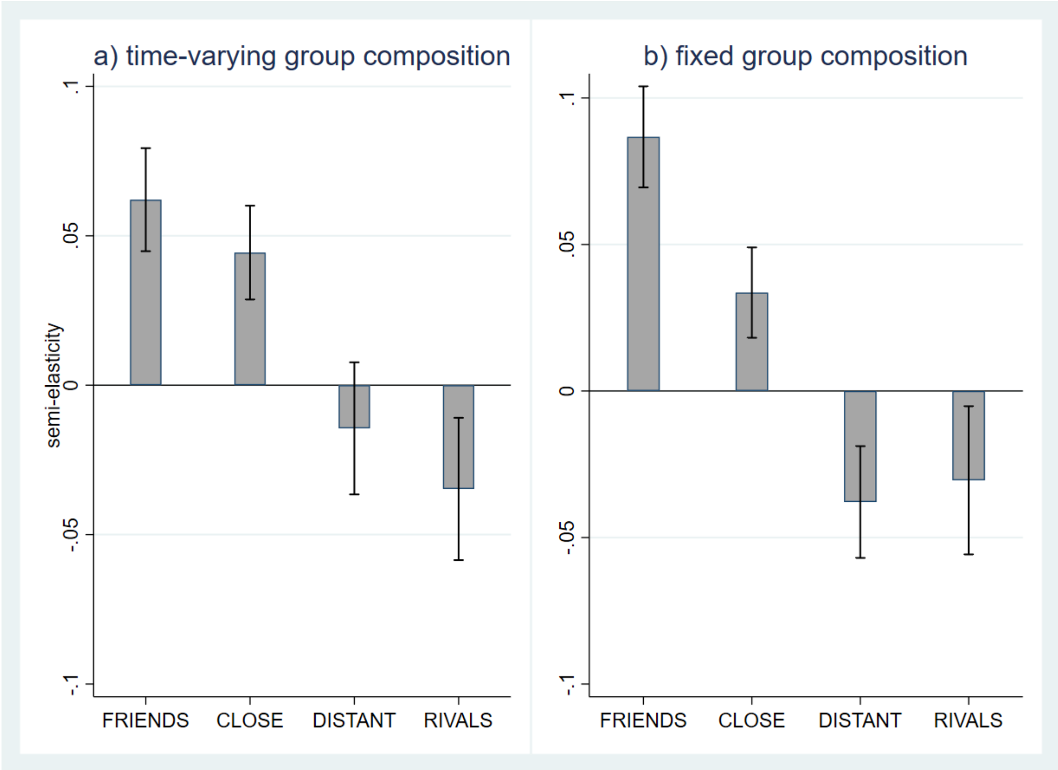

Fig. B: Effect of trading within geopolitical groups since 2018. Notes: Bars represent the estimated semi-elasticity of trade to country groups according to their geopolitical distance. The whiskers represent 95% confidence bands. Estimates in both panels are obtained by PPML on the sample period 2012-2022 using consecutive years and controlling for bilateral time-varying variables, exporter-time fixed effects, importer-time fixed effects and exporter-importer fixed effects. In the left-hand side panel we also control for pre-existing trends in trade flows within groups. The dependent variable is nominal bilateral trade excluding energy.

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