Rivalries, War, and Trade*

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August 4, 2025

Abstract

We examine how trade is affected by the anticipation of a military conflict, as reflected in the presence of an ongoing strategic rivalry between countries. By combining a recent database of strategic rivalries with information on defense alliances, military conflicts, and bilateral trade for the years 1950-2019, we show that deteriorating relations impact trade independently of the destructive effects of actual wars. In particular, we find that strategic rivalries, defined as situations where nations perceive one another as military threats, can significantly suppress trade, especially when the underlying conflicts involve ideological disputes or stem from multiple distinct sources of tension. The effect of rivalries on trade also varies significantly over time, with the largest negative effects realized during the Cold War era. Over the entire sample period, accounting for strategic rivalries reduces the estimated impact of wars on trade by nearly 35 percent, suggesting that a significant portion of the trade disruption attributed to wars may actually reflect the antagonistic conditions associated with rivalries.

Keywords: International relations, trade and war, liberal peace, geopolitical fragmentation

*We thank conference participants at the Southern Economics Association Meetings, the International Trade and Finance Association Meetings, and the Midwest International Trade Conference for useful comments.

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1 Introduction

International trade has long been viewed as a significant driver of economic growth and increased welfare for the participating countries. While economic theory has normally highlighted how trade allows countries to gain from the expansion of product variety and the more efficient allocation of resources, scholarship in international relations has emphasized the further benefits from trade that pertain to how it shapes incentives for destructive wars. According to the "liberal peace" hypothesis, insofar as war between countries disrupts their trade and thus limits the realization of the potential benefits, increased trade openness can be viewed as raising the opportunity cost of such conflict and hence serves to pacify international relations.[1] The basic premise of this hypothesis, that war disrupts trade, seems intuitive enough. War-induced damage of essential trade infrastructure (e.g., highways, railways, and ports) and outright military activity raise the costs and risks of transporting goods. The imposition of naval blockades or embargoes imposed to prevent the import or export of goods or resources similarly limits trade. Even when trade is logistically possible, importers and exporters located in the warring countries might be reluctant to trade with each other due to lower trust or confidence that the other party will fulfill an agreed upon contract for payment or delivery of goods. These same considerations suggest that the mere anticipation of war could dampen bilateral trade flows, i.e., with or without the realization of an actual military conflict. Specifically, in anticipation of a future war, firms may preemptively aim to reduce their dependence on trade partners in enemy countries and replace them with others located in more friendly nations. Similarly, governments might implement policies (e.g., impose tariffs or sanctions) that further induce trade diversion both directly and indirectly.[2]

In this paper, we analyze empirically the effects of the anticipation of a possible future war on bilateral trade flows. Our analysis, which focuses on the effects of *strategic rivalries* as identified by Thompson et al. (2022) and that may—but need not—result in war, contributes to the literature that falls at the intersection of international trade and international relations. Couched in the micro-founded gravity model of trade, much of the earlier work in this literature considers how discrete events of conflict (i.e., war) matter for trade flows. The results are somewhat mixed, as might be expected, since these empirical analyses use relatively short sample periods and include only country pairs considered to be major powers or neighboring states, largely excluding country pairs not likely to engage in conflict. Notably, some (e.g., Morrow et al., 1998; Mansfield and Pevehouse, 2000) find little to no disruptive effect of war on trade, whereas others (e.g., Mansfield and Bronson, 1997; Reuveny and Kang, 1998; Keshk et al., 2004) find that militarized interstate disputes generate significant negative effects.[3] Time-series analyses of select country pairs similarly

[1] See Polachek (1980) for an early theoretical treatment and empirical analysis in support of this hypothesis. More recently, Martin et al. (2008) and Morelli and Sonno (2017) provide additional evidence with the qualification that multilateral trade openness can reduce bilateral trade dependence and thereby reduce the opportunity cost of war.

[2] See Pollins (1989). Garfinkel et al. (2022) demonstrate theoretically that, while countries might prefer to trade today even with a potential future enemy, such a preference is less likely to hold for a country that is significantly larger than its rival as the rival tends to use more of its gains from trade to improve its relative military power.

[3] This latter finding is confirmed by Oneal and Russett (2001) and Oneal et al. (2003) who use longer sample

produce mixed results. In particular, whereas Barbieri and Levy (1999) focusing on seven country pairs find that wars do not have a long-term effect on trade, Anderton and Carter (2001) who study a slightly expanded sample of warring dyads find significant trade disruption not only during the war but afterwards, especially where both sides represent major powers. More recent studies based on the gravity model using panel-data techniques with fixed effects for country-pairs similarly find significant effects. Martin et al. (2008) estimate that war reduces trade flows by 22 percent. Glick and Taylor (2010), who consider a much longer sample period, find the effect to be notably larger at 90 percent.[4]

In contrast to the literature just described, our focus on rivalries allows us to identify the effects on trade flows of the evolution of conflictual relations between nations independently of the occurrence of an observed conflict event. Drawing on the database assembled by Thompson et al. (2022), we examine these evolving relations using their classification of strategic rivalries, which are said to exist between two countries when each one views the other as a "competitive, threatening enemy." Importantly, the definition of a strategic rivalry in Thompson et al. (2022) is tied to the expectations of a militarized conflict—but does not require its realization—and is based on the perceptions of the key decision-makers in each country as opposed to reflecting general enmity or mistrust felt by their respective citizens. Therefore, it describes a unique strategic situation where countries may not currently be at war but the threat of war is being taken seriously by those with the capacity to prepare for it and, if necessary, wage it.[5]

As another appealing feature of their database, Thompson et al. (2022) also categorize strategic rivalries into four types, according to the nature of the issues being contested:

- *positional rivalries*, where states compete for influence or prestige within a specific region or globally;
- *spatial rivalries*, where states compete for control of some territory;
- *ideological rivalries*, where states contest the relative virtues of different belief systems that may be political, economic or religious; and
- *interventionary rivalries*, where one state intrudes into the internal affairs of another state to gain influence or reduce a perceived threat.

This categorization of different rivalry dimensions is useful for our purposes for two main reasons. First, given our interest in how rivalries affect trade, it offers a window into which sources of contention between rivals may be most salient for trade. Second, a rivalry between any two given nations can involve more than one of the above categories, indicating a situation where multiple issues need to be resolved.[6] Accordingly, and as hypothesized by Thompson et al. (2022), rivalries

periods and include all available country pairs. Oneal et al. (2003) include additionally distributed lags of conflict as explanatory variables to capture the longer term effects of war on trade.

[4]Also see Blomberg and Hess (2006), who estimate the negative effect of terrorism, while controlling for other forms of external conflict as well as domestic conflict, to be as large as a 30 percent tariff.

[5]Below, we elaborate on this definition as well as the authors' identification methodology.

[6]In our sample, 57 percent of the rivalries have at least 2 types. For example, the Croatia-Serbia 1991-2002 rivalry is classified as both spatial and interventionary.

that cover more than one of these domains may be perceived as more likely to last indefinitely and less likely to end peacefully. In our context, this hypothesis motivates our test of whether the negative effects of a rivalry on trade increase in the *extent* of that rivalry, a proposition for which we generally find strong evidence.

Our main findings are as follows. Rivalries can have large negative effects on trade flows above and beyond the effect of current or recent wars, reducing trade by roughly 17 percent on average. Rivalries that are ideological, spatial, or interventionary in nature are all found to have larger negative effects, with the largest effects arising when the rivalry has an ideological dimension or is more extensive, in the sense that it covers more than one of the rivalry dimensions in Thompson et al. (2022). For example, for rivalries covering three or more distinct sources of contention, our estimates imply large reductions in trade ranging from 50 percent to nearly 70 percent. As expected, we also find that wars themselves significantly reduce trade. However, when both the presence and extent of a rivalry are accounted for, the estimated effect of active conflict falls by more than a third. Overall, these findings suggest that antagonism between rivals can explain a significant portion of the measured effects of conflicts on trade previously identified in the literature. In addition, we find that rivalries have had very different impacts on trade at different points in our sample. The negative effects of rivalries on trade were most pronounced during the Cold War period, possibly reflecting the overall heightened perceptions of conflict risk during that era. Furthermore, when we narrow our focus to trade in specific industry categories, we find the estimated effects of rivalries are mostly driven by parts and accessories trade and by trade in consumer goods. In addition, we find large effects for the semiconductor industry, which may reflect its particular strategic value.

Aside from our focus on strategic rivalries, another differentiating aspect of our work from much of the literature mentioned above is that we also control for the effects of defense alliances, taken from Gibler (2008). As a natural contrast to how rivalries might be expected to cause countries to make calculated decisions about restricting trade, the security, goodwill, and internalization of mutual threats offered by an alliance may cause countries to strengthen their trade relations. Because conflicts do not tend to arise between countries that are allies and because trade increases within alliances, failing to control for the effects of alliances on trade could lead to an overestimation of the negative effects of conflict. Consistent with other recent studies (Haim, 2016; Li et al., 2024; Jackson and Shepotylo, 2024), we find that alliances are indeed associated with increased trade but that excluding a control for alliance membership does not turn out to contaminate the estimated effects of either conflict or rivalry.

To the best of our knowledge, the only other paper to study the effect of rivalries on trade flows is Long (2008), which estimates their effects while accounting for monadic factors associated with conflict expectations, such as country-specific political risk. Our analysis improves on Long's work in terms of both data coverage and methodology. In terms of data, our sample period extends from 1950 to 2019, whereas Long's sample period is 1984–1997, and his rivalry data come from Thompson (2001) which does not distinguish between different types of rivalries or the extent of a given rivalry. In terms of methodology, we follow the latest developments in the empirical trade

literature, adopting Poisson Pseudo-Maximum Likelihood (PPML) to estimate a gravity model with a rich set of exporter-time, importer-time, and exporter-importer fixed effects. The use of such fixed effects essentially strips away all country-specific and multilateral influences on trade, thereby allowing the estimation to isolate the effects of changes in a pair of countries' rivalry status on bilateral trade conditions specific to that pair. As mentioned earlier, we also control for factors that are likely be related to rivalries and affect trade, including participation in defense alliances and belonging to the Eastern bloc (Campos et al., 2024), as well as episodes of armed conflict.

Our analysis also relates to an emerging literature on the economic implications of changing geopolitical tensions and risks. Gopinath et al. (2025), for example, find a sudden decrease in trade, FDI, and portfollio flows between UN voting blocs following the onset of the recent Russia-Ukraine war. In complementary findings, Hakobyan et al. (2023) find trade falls when countries become less aligned in their treaty obligations, while Bosone and Stamato (2024) show that deviations in UN voting patterns directly translate to reduced trade. Adding micro-level evidence, Kempf et al. (2025) find that U.S. firms are more likely to stop doing business with countries whose governments adopt ideologies that are too distant from their CEO's. Our own work resonates with this literature because we provide further evidence that geopolitical tensions, broadly defined, matter for trade. To position our contribution more clearly, it is important to note that our estimates for the effects of rivalries are not affected by controlling for UN voting differences, indicating that the presence of rivalry reflects a distinct type of friction not yet captured in this literature. Indeed, the only other recent study that has examined the inter-relationships between rivalries, geopolitics, and trade is Kleinman et al. (2024), who actually investigate the opposite question of how changes in economic dependence affect UN voting alignment and the formation of rivalries. In light of the findings of Kleinman et al. (2024), it is also worth noting we find no evidence that our estimates for the effects of rivalries on trade are driven by trade declining prior to the onset of a rivalry.

In what follows, the next section describes the data used and our empirical approach. Section 3 presents the results. Finally, in Section 4, we discuss the implications and suggestions for future work.

2 Data and Empirical Approach

Our data set includes approximately 1.85 million observations at the country-pair level between 195 unique countries covering 70 years, from 1950 to 2019. Aside from the trade data, the key variables are the strategic rivalry indicators from Thompson et al. (2022) and the defense alliance variable we take from Gibler (2008). We discuss these data sources first, followed by the construction of the trade data and the other covariates, and then our econometric methods.

2.1 Rivalries, Conflicts, and Alliances

As explained above, our identification of strategic rivalries comes from Thompson et al. (2022). In order to qualify as a strategic rivalry, the relationship between a pair of countries must meet three criteria. First, rivalries are mutual: each side sees the other as an enemy and considers how the other side will respond to any action. Second, strategic rivals must pose some threat to each other, such that there is some possibility of military conflict. Finally, rivals see each other as being "in the same league," in the sense that it is at least possible for each side to address the threat from the other, and each side must see the threat as being worthy of its attention. This means that a very small state such as Estonia may consider Russia to be an enemy, but they are not rivals because they do not see each other as competitors. However, a rivalry reflects more than simply economic competition. It is antagonistic, involving either persistent or repeated disputes, and has at least the perception of a threat from both sides. As Thompson et al. (2022) explain:

> "*The first time two states collide over some mutual interest, it is simply a conflict. Allow the conflict to go unresolved or to fester over time and decision-makers will begin to perceive their adversary as a persistent problem. Add some sense of potential military clash over the persistent problem and you have a rivalry.*" (Thompson et al., 2022, p. 2)

The authors go on to summarize their classification of rivalries more simply as being based on "who decision-makers perceive to be their adversaries" (p. 3). Their process for identifying rivalries involves a careful examination of the historical record as well as statements by governments, with each potential rivalry considered individually, on a case-by-case basis. In instances where the source documents reveal conflicting views among the decision-makers within a state, the determination is made on the basis of the documented perceptions of those decision-makers who control the government and foreign policy-making in particular.

Since this classification simultaneously picks up issues associated with the potential emergence of conflict as well as the beliefs of key actors in each country, one should not be surprised that the rivalries identified may very well lead to military conflict: while just 0.03 percent of non-rivalry observations in our data are associated with militarized conflict, almost 6 percent (5.75 percent) of rivalry observations in our dataset are associated with a militarized conflict. Nonetheless, 61 percent of country pairs that have had a rivalry have never had an active conflict. What's more, not all military conflicts necessarily imply a strategic rivalry. In order for a military conflict to also qualify as a strategic rivalry, the rivalry must continue after the military conflict has ended. Indeed, an appealing feature of Thompson et al. (2022)'s process is that it does not rely on the realization of military conflict to identify a strategic rivalry, which would otherwise exclude rivalries that do not develop into military conflicts and would also make identifying beginning and end dates of the rivalry difficult. Importantly, this feature allows us to separately identify the impact of each on trade.

Because the number of different pairs of countries is large, the existence of a rivalry, like the emergence of conflict, is relatively rare. A strategic rivalry exists for 7,325, or less than 0.5 percent, of the 1.85 million observations in our data set. By comparison, a realized conflict, taken from the UCDP Dyadic Data Set on military conflicts, occurs even less frequently, in only 0.05 percent (944) of the observations in our data. This discrepancy underscores two key features of the strategic rivalry data. First, as previously noted, the threat of a possible war associated with rivalries can exist without the emergence of an actual war. Second, when rivals go to war, the enmity within that rivalry can predate the emergence of the war and also last long after it concludes.

These features are reflected in a low correlation coefficient across all observations between the rivalry and active conflict variables of just 0.159. This is not surprising given that Thompson et al. (2022) rely on recorded statements and perceptions to identify rivals. But this measure may also be low because rivalry and active conflict between a pair of countries are not necessarily synchronous. When we instead calculate the cross-sectional correlation, which considers for each pair of countries whether they ever had a military conflict and whether they were ever rivals, we find a much higher correlation of 0.382. Furthermore, the likelihood of a country-pair ever being engaged in military conflict is just 0.54 percent for non-rival countries but a much higher 39.07 percent for countries that are rivals at some point.[7]

As shown in Figure 1, there is considerable variation in the number of active rivalries in the world over time. The number started to increase substantially in the middle of the Cold War years around 1960, reaching a high point in 1980 and then retreating as the Cold War ended, only to increase significantly again in the mid-1990s. It then declined just as sharply in the early 2000s before exhibiting another sudden increase around 2010 and then yet another decline around 2016. Importantly, while some of the strategic rivalries were related to the Cold War, a large proportion were not. Over our 1950–2019 sample period, Thompson et al. (2022) identify a total of 184 rivalries.[8] Egypt and Libya each had 11 strategic rivalries, while Iran, Sudan, and Uganda each had 10. Despite some countries having more rivalries than others, it is very common for a country to have a rival at some point: of the 195 countries in our sample, 113 were engaged in at least one strategic rivalry during this time period.

Beyond classifying whether two countries are engaged in a rivalry, Thompson et al. (2022) categorize each rivalry into one or more of the following four rivalry types: spatial, interventionary, positional, and ideological. States involved in a spatial rivalry are contesting control over some territory. One notable example is the dispute between Serbia and Kosovo over the political status of Kosovo since 2008, when Kosovo issued a declaration of independence. In a positional rivalry, states compete for influence and prestige, as in the second rivalry between China and the United States (1996 to the present) or between Russia and the United States. An interventionary rivalry

[7]The majority of military conflict between non-rivals is in cases where countries fought on opposite sides of the Korean War or the War in Vietnam.

[8]Figure 1 and Table 1 (discussed below) are based on the complete Thompson et al. data for the 1950-2019 time period and includes 184 distinct rivalries. Our dataset includes 167 of these rivalries because of missing data for some country pairs.

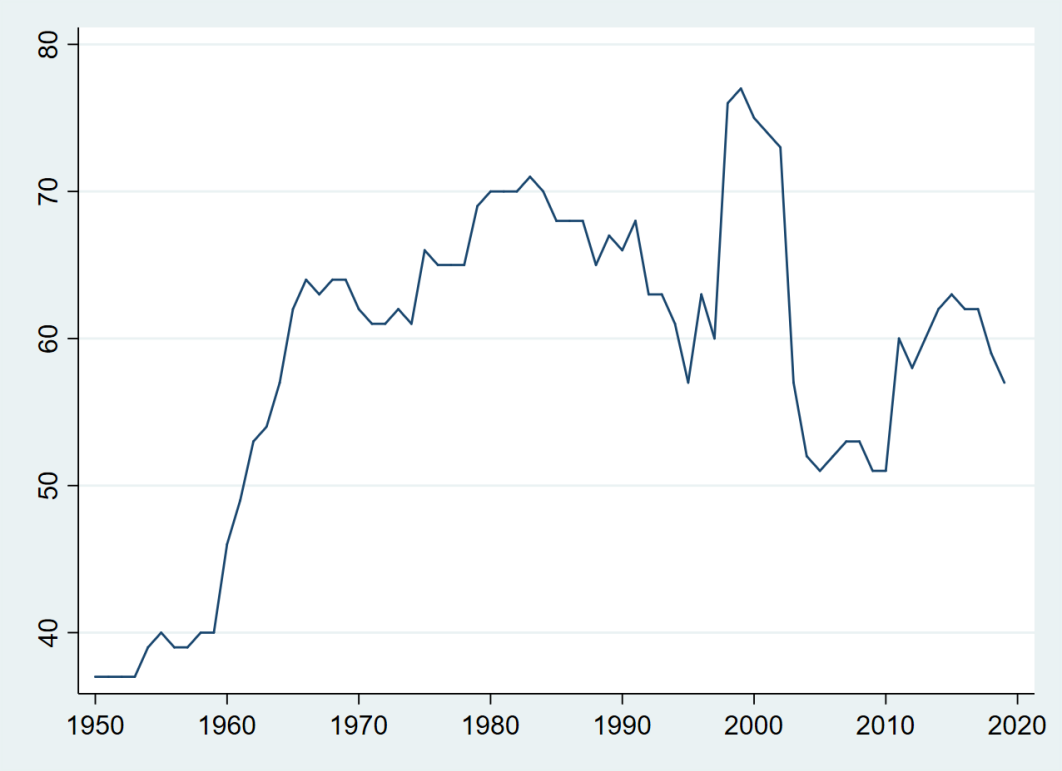

Figure 1: Number of Strategic Rivalries, 1950-2019

is defined by one state interfering in the internal affairs of another, typically adjacent, state. This may be done in order to gain influence or reduce a threat. An example is Turkey interfering in Syria since 2011 over the Assad government's policies, specifically its treatment of protesters. Finally, an ideological rivalry may be along political, economic, societal, or religious lines. The first rivalry between China and the United States (lasting from 1949 to 1972) serves as an example. In general, these categories should be seen as overlapping. Indeed, more than 50 percent of rivalries are of more than one type. As Table 1 shows, different rivalry types have been more common at different points in time. Spatial and positional rivalries have generally been the most prevalent types of rivalry, but interventionary rivalries have become increasingly common in recent years. The share of rivalries considered ideological in nature has usually been lower than those of the other types, but it did reach a peak of around 43 percent in the 1970s and 1980s during the latter stages of the Cold War.

While other rivalry data sets exist (e.g., Bennett, 1996; Diehl and Goertz, 2000), we use the Thompson et al. data because these other data sets identify rivalries by working backwards from conflicts and thus exclude rivalries that do not develop into armed conflicts.[9] We focus our analysis

[9]Diehl et al. (2021) extend the data in Diehl and Goertz (2000) by categorizing each dyadic relationship along a peace scale (severe rivalry, lesser rivalry, negative peace, warm peace, security community). As the authors note, the rivalry coding is largely consistent with the data in Thompson et al. (2022) and as such does not provide additional information about interstate rivalries which is the focus of our paper. While the dataset does contain additional

Table 1: Rivalries by Type in Select Years

Year	Number of rivalries	Positional	Spatial	Ideological	Interventionary
1950	37	62.1%	67.6%	29.7%	35.1%
1960	46	63.0%	65.2%	39.1%	37.0%
1970	62	54.8%	64.5%	43.5%	45.2%
1980	70	50.0%	60.0%	42.9%	48.6%
1990	66	50.0%	60.6%	27.3%	51.5%
2000	75	38.7%	45.3%	14.7%	65.3%
2010	51	51.0%	54.9%	19.6%	54.9%

Notes: The number of rivalries shown equals the number of country pairs with at least one type of strategic rivalry in that year. The percentages shown for each type are normalized by number of rivalries.

on whether an adversarial relationship impacts trade outside of armed conflict—that is, whether simply the threat of potential conflict impacts trade negatively. We therefore also use the UCDP Dyadic Data Set (Version 22) to identify and control for inter-state armed conflicts. These conflicts entail the use of armed forces of two different governments that results in at least 25 battle-related deaths in a year. We exclude purely intra-state armed conflicts because the focus of our analysis is on relations between states; any impact of such intra-state conflicts (i.e., between a government and an opposition or rebel group) will be captured by country-year fixed effects. However, we do include instances where foreign troops are involved in an intra-state conflict.

One of the drawbacks of the Thompson et al. data is that there is no measure of rivalry intensity. It is reasonable to suppose that a deeper rivalry might imply a greater threat and also have a greater impact on trade. We address this in two ways. First, we construct an "extent of rivalry" variable that counts the number of rivalry types for each pair of rivals. While this does not provide an explicit measure of rivalry intensity, it does measure the number of dimensions along which a rivalry is pursued and could reasonably be correlated with rivalry intensity. Moreover, as hypothesized in Thompson et al. (2022), more extensive rivalries are likely to be perceived as more intractable than other rivalries due to the multiplicity of issues that need to be resolved, all else equal. Insofar as higher conflict expectations translate to larger trade effects, incorporating rivalry extent in our analysis serves as a test of this hypothesis. Second, we consider whether longer-lived rivalries differ in their impact from recent or short-lived rivalries.

Another drawback of the Thompson et al. data is that it includes no indication of cooperation between countries. To avoid possible bias in our estimates of the effects of rivalries on trade flows (as described below), we include an indicator of whether there was a defense alliance between country pairs using Gibler's Formal Alliances data set (version 4.1). We use specifically Gibler's defense pact variable as our indicator of an alliance. Two countries are considered to have a defense pact

information about non-rivals, it includes only 2,631 dyads or about 10 percent of the country pairs in our trade data.

if they are committed to one another's defense if the other is attacked.[10]

2.2 Trade Data and Other Data Sources

The main (aggregate-level) trade data consist of trade between 195 unique countries that combine into 17,988 trading country pairs observed over 70 years from 1950 to 2019. Not all countries exist continuously over the entire period, giving us an unbalanced panel data set of roughly 1.85 million observations.[11] We also use a supplementary industry-level trade data set that covers the years 1962-2019 only. The latter is obtained by combining 4 digit-level SITC trade flows from the NBER UN database (Feenstra et al., 2005), which spans 1962-2000, with data from UN COMTRADE for the same industry classification for the more recent years.

We rely on two sources for the aggregate-level trade data. For most observations, we take data from IMF DOTS database, provided as part of the CEPII gravity database. But, for non-market economies during the Cold War, we supplement the IMF DOTS data with data assembled by Gleditsch (2002), which eliminates many missing values associated with these countries. In all cases, we favor the reported import value if it is available and use the reported export value for that same trade flow in the cases where an export value is reported but an import value is not.

For the industry-level data, we use the information for each SITC category to construct several aggregates of interest to see if effects differ for different types of trade. Following the strategy used in Brunel and Zylkin (2022), we classify goods both by their end use and by their different factor intensities (especially the different types of capital they tend to use). For the former, we use SITC-to-BEC concordances to classify each SITC category by its end use, giving us information on total bilateral trade for capital goods, consumer goods trade, and total parts and accessories trade. To obtain information on factor intensities for each SITC code, we take data from Nunn and Trefler (2013). Based on the latter, we obtain series for total computer-intensive trade, total R&D-intensive trade, and total other machinery-intensive trade (what Nunn and Trefler (2013) consider "proprietary capital"-intensive trade). In addition to these data series, we consider two specific industries we would expect to have particular strategic importance: the aerospace industry, consisting of trade in aircraft and aircraft parts (SITC 792), and the semiconductor industry (SITC codes 776 and 7282). Finally, we construct our own series for total energy-related trade, defined as total trade in energy commodities plus all trade in electricity generating and transmission equipment.[12]

The remaining covariates in our analysis come from standard sources. GATT/WTO mem-

[10] The database also includes information on other types of cooperative arrangements such as nonaggression agreements and neutrality agreements. However, these arrangements only ask that each country not interfere in the other's strategic affairs and therefore need not indicate the presence of friendly relations. For example, the Soviet Union and the United States had a formal neutrality pact from 1962-1964 in spite of the Cold War.

[11] Some countries, such as Yugoslavia and the German Democratic Republic (East Germany), cease to exist during this time period while others, such as Serbia and Lithuania, are newly established as independent states. As such it is not logically possible for each country to trade with all other countries in the sample.

[12] This combined category consists of 2 digit SITC codes 32–24 and 3 digit codes 716, 718, and 771–773.

bership and the presence of a colonial relationship are obtained from CEPII. Our indicator for a free trade agreement is taken from the NSF-Kellogg Institute Database on Economic Integration Agreements, which we extend ourselves using data from the WTO for more recent years.

2.3 Estimation Strategy

A central aim of the empirical analysis is to assess whether foreign policy, and specifically a strategic rivalry with a trading partner, reduces bilateral trade. Our initial estimating equation, therefore, includes a binary variable indicating whether country pair (i, j) have a rivalry in year t. Given the expected links between strategic rivalries and active conflict and given our objective to distinguish the effects of an anticipated conflict from the effects of a realized one, we also allow armed conflicts to have their own distinct effects on trade. Formal alliances and free trade agreements may also be determined simultaneously with strategic rivalries and so require additional consideration. Taking all of these potential bilateral foreign policies that are likely to affect trade into account, our baseline estimation equation for studying the impacts of a strategic rivalry on bilateral trade is

$$y_{ijt} = \exp(\alpha_{it} + \gamma_{jt} + \eta_{ij} + X_{ijt}\beta + \delta RIVAL_{ijt}) + \varepsilon_{ijt}, \tag{1}$$

where the dependent variable, y_{ijt}, measures exports from i to j in year t and $RIVAL_{ijt}$ is a binary variable equal to 1 if i and j are strategic rivals in year t and zero otherwise; the vector X_{ijt} is a set of controls, including whether in year t the countries were both members of GATT/WTO, whether the countries had a free trade agreement (FTA), whether they were in a colonial relationship with each other, and whether the countries were engaged in a military conflict with each other. We include two additional controls in an extended estimation: whether the country pair had belonged to a (common) defense alliance and whether the country pair were both members of the Eastern bloc during the Cold War. These additional controls allow us to consider alternative links between diplomatic relations and trade volumes. Controlling for a mutual defense alliance, in particular, ensures that the analysis distinguishes between neutral relationships and formal alliances when comparing rivals to non-rivals. Controlling for joint membership in the eastern bloc ensures that our results are not driven by Cold War dynamics.

We estimate (1) using PPML with exporter-year, importer-year, and exporter-importer fixed effects $(\alpha_{it}, \gamma_{jt}, \eta_{ij})$. The use of PPML together with these fixed effects allows us to address several well known issues that have been highlighted in previous studies that estimate gravity models and in the empirical trade literature more broadly. As famously shown by Anderson and Van Wincoop (2003), all third-country effects on bilateral trade can be usefully aggregated into country-specific "multilateral resistance" indices, which here are absorbed by exporter-time and importer-time specific fixed effects. The addition of exporter-importer (or pair) fixed effects follows Baier and Bergstrand (2007) who argue persuasively that estimates of the effects of endogenous variables such as free trade agreements are biased unless these fixed effects are included. The advantages of the resulting "three-way" gravity specification have been discussed further in numerous subsequent

papers, including Glick and Rose (2016) and Yotov et al. (2016). Weidner and Zylkin (2021) document the special consistency properties of PPML for estimating this type of econometric model, echoing the earlier recommendations of Santos Silva and Tenreyro (2006). Another well-known advantage of PPML is that it allows for zero trade flows, whereas estimating (1) in logs using OLS, now a less-favored practice, precludes their inclusion.

The gravity model is quite intuitive as an empirical framework for studying trade flows. The inclusion of the three fixed effects ensures that identification is driven by variation across time within country pairs relative to their respective trade flows with third countries. Thus, we would not obtain significant effects if trade generally rises for falls for a particular country due to factors that are internal to that country. Instead, we should find that rivalries impact trade only if there are changes in trade that are specific to the pairs that are strategic rivals.

3 Results

We first investigate the average impact on bilateral trade of the simple existence of a strategic rivalry between two countries. Columns 1–5 of Table 2 report the results. Column 1 shows the benchmark model, excluding the strategic rivalry indicator, while including the standard control variables (i.e., indicators for FTA, GATT/WTO, and a current colonial relationship). Column 2 adds a control for active conflict. Column 3 adds the strategic rivalry indicator. In columns 4 and 5, we include two additional control variables. First, we control for whether a pair of countries had a formal defense alliance in a given year. Second, in column 5, we control for whether both countries were part of the Eastern bloc in order to investigate whether the geopolitical alignment of the Warsaw Pact countries influences our results. Column 6 repeats the analysis in column 3, replacing the binary rivalry variable (i.e., the simple indicator of the existence of a rivalry) with the rivalry extent variable that takes on an integer value between 0 and 4 to indicate how many distinct dimensions of rivalry were present between countries i and j in year t. Columns 7–8 include both the binary indicator and the rivalry extent variable, thereby treating the rivalry extent variable as an interaction term, so that we can test whether the effect of rivalries increases or diminishes with their extent. Finally, in column 9, we replace the rivalry extent variable with four binary variables representing the number of dimensions in which a rivalry exists.

The estimated coefficient for the presence of a strategic rivalry, in columns 3, 4, and 5, is negative as expected. Each of the coefficient estimates are similar, around -0.19, implying that rivalries are associated with roughly a $1 - exp(-0.19) = 17.30$ percent decline in trade. The estimated effects are statistically significant at the 5 percent level. When we control for the presence of a defense alliance or mutual membership in the Eastern bloc, the magnitude of the effect on trade is slightly larger (columns 4 and 5). In column 6, where we replace the binary rivalry variable with the rivalry extent variable, the estimated effect is negative and statistically significant at the 1 percent level, indicating that, when a strategic rivalry extends to additional dimensions, trade between the rival countries falls further. Specifically, the estimated coefficient on rivalry extent implies that, when a

Table 2: Gravity Results - The Presence of Rivalries and their Extent

	Dependent variable: Aggregate Bilateral Trade Flows, 1950-2019								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
FTA	0.126***	0.126***	0.124***	0.122***	0.121***	0.123***	0.123***	0.120***	0.120***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
GATT / WTO	-0.084	-0.101*	-0.091	-0.080	-0.084	-0.089	-0.094	-0.088	-0.087
	(0.066)	(0.062)	(0.061)	(0.061)	(0.061)	(0.061)	(0.060)	(0.060)	(0.060)
Current colony	0.386*	0.385*	0.385*	0.374*	0.376*	0.385*	0.385*	0.376*	0.376*
	(0.210)	(0.209)	(0.210)	(0.206)	(0.206)	(0.210)	(0.210)	(0.206)	(0.206)
Active conflict		-0.647***	-0.506***	-0.509***	-0.514***	-0.396***	-0.359***	-0.373***	-0.390***
		(0.112)	(0.116)	(0.116)	(0.115)	(0.101)	(0.094)	(0.093)	(0.097)
Rivalry			-0.187**	-0.194**	-0.190**		0.404**	0.382*	
			(0.090)	(0.090)	(0.090)		(0.205)	(0.204)	
Rivalry extent (0-4)						-0.166***	-0.390***	-0.377***	
						(0.042)	(0.108)	(0.107)	
Defense alliance				0.408***	0.348***			0.347***	0.347***
				(0.060)	(0.059)			(0.059)	(0.059)
Eastern bloc					1.216***			1.200***	1.193***
					(0.177)			(0.178)	(0.178)
Extent=1									-0.004
									(0.111)
Extent=2									-0.348***
									(0.079)
Extent=3									-1.018***
									(0.264)
Extent=4									-0.406
									(0.637)
Rivalry + 1 × Extent							0.013	0.005	
Rivalry + 2 × Extent							-0.377***	-0.373***	
Rivalry + 3 × Extent							-0.767***	-0.750***	
Rivalry + 4 × Extent							-1.158***	-1.127***	
N	1849208	1849208	1849208	1849208	1849208	1849208	1849208	1849208	1849208

Notes: Poisson PML with three-way (exporter-time, importer-time, and exporter-importer) fixed effects. Standard errors clustered by exporter-importer pair. Significance levels are indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

rivalry between a country pair begins or if an existing rivalry expands to an additional dimension, bilateral trade will fall on average by $1 - exp(-0.166) = 15.30$ percent. As we control for military conflict in our estimation, the reduced bilateral trade between rivals results from the countries regarding each other as enemies and threats and does not reflect the impact of military conflict on trade.

In contrast to column 6, the estimates shown in columns 7–9 indicate that a rivalry of just one dimension does not have a statistically significant impact on bilateral trade. In column 8, the effect of such a rivalry is estimated to be $0.382 - 0.377 = 0.005$, and a Wald test indicates that this is not statistically significant; similarly, the estimated coefficient of -0.004 reported in column 9 for a rivalry of just one type is not statistically significant either.[13] However, having a rivalry that extends beyond one dimension generally does have a significant and increasingly negative impact on bilateral trade. As shown in the bottom rows, the estimates from column 8 produce net coefficients of -0.373 and -0.750 for two-dimensional and three-dimensional rivalries, respectively, increasing to -1.127 for rivalries with all four dimensions. Wald tests indicate that each of these combined coefficients is statistically different from zero at the 1 percent significance level. Furthermore, these estimates translate to economically large trade effects: a 52.76 percent decrease in trade for a rivalry with three dimensions and a 67.60 percent decrease for one with all four dimensions. The estimates from column 9 exhibit a similar pattern, showing that a two-dimensional rivalry is associated with $1 - exp(-.348) = 29.39$ percent less trade, while a three-dimensional rivalry is associated with $1 - exp(-1.018) = 63.87$ percent less trade, with both estimates again significant at the 1 percent significance level. The estimated coefficient on the indicator for a four-dimensional rivalry is not significantly different from zero; but, due to its large standard error, we cannot rule out a large effect like the one implied in column 8 either.

The control variables enter into the estimation as expected. The estimated coefficients for an FTA and for mutual GATT/WTO membership are consistent both across specifications and with other findings from the literature: while GATT/WTO membership has no measurable impact on bilateral trade, an FTA increases bilateral trade significantly.[14] Interestingly, the implied trade impact of entering into an FTA can be viewed as comparable to that of ending a rivalry: based on the estimates reported in column 5, for example, an FTA increases trade by $exp(0.121) - 1 = 12.86$ percent, while the resolution of an existing rivalry increases trade by $exp(0.190) - 1 = 20.09$ percent, with even larger effects implied by subsequent columns when we consider rivalries that span multiple dimensions. For a rivalry with just two dimensions, for example, our results in column 7 imply that bringing it to a close will increase trade by $exp(0.373) - 1 = 45.21$ percent.

Countries that are currently in a colonial relationship also have higher levels of bilateral trade,

[13] Here, it is important to clarify that every rivalry is coded as having at least one of the four rivalry dimensions. Therefore, the significant positive coefficient found for the rivalry indicator in columns 7 and 8 does not imply that rivalries are associated with increased trade.

[14] The lack of an effect of GATT/WTO membership on aggregate trade flows was first noted by Rose (2004). A recent re-evaluation of Rose (2004)'s findings by Esteve-Pérez et al. (2020) obtains a similar result using methods and data that closely resemble our own.

and the average effect is more than three times that of an FTA. This effect is also consistent across specifications.

The table also shows, across the various specifications, that a military conflict between countries reduces trade flows. However, its estimated impact varies significantly depending on whether the presence and extent of a rivalry are accounted for. In column 2, when it is introduced on its own without controlling for the effects of rivalries, we find that conflict reduces trade by an estimated $1 - exp(-0.647) = 47.64$ percent. When rivalries are included in the specification and especially when we add some measure of rivalry extent, the estimated effect of a conflict falls significantly. In column 8, for example, the estimated coefficient for conflict is -0.373, implying an average reduction in trade of $1 - exp(-0.373) = 31.13$ percent—roughly 35 percent smaller than the average reduction in trade attributed to active conflict when no measure of strategic rivalry is included (column 2). These findings suggest that a significant portion of the reduction in bilateral trade that might otherwise be attributed to military conflict may, in fact, be due to the antagonistic relations associated with strategic rivalries.

Finally, joint participation in a formal defense alliance and being part of the Eastern bloc during the Cold War each increase bilateral trade, while leaving the other estimated coefficients largely unchanged (columns 4 and 5). In particular, participation in a common defense alliance is associated with about $exp(0.408) - 1 = 50.38$ percent more bilateral trade (column 4); and, mutual membership in the Eastern bloc more than doubles trade (column 5). These large effects remain intact when using the rivalry extent variable(s) instead of the binary rivalry variable (columns 7–9).

Having found in Table 2 that the number of dimensions matters for the magnitude of the effect of a rivalry on trade, we next consider whether this relationship is stronger for some rivalry types versus others. To do so, we amend our estimating equation in (1) by including both the binary variable that indicates the existence of any rivalry ($RIVAL_{ijt}$) and a binary variable that indicates whether the rivalry is of a particular type (positional, spatial, interventionary, or ideological), again serving as an interaction term. The coefficient on the binary rivalry type variable tells us whether the impact of a particular rivalry type on bilateral trade is significantly different from the average impact across all types of rivalries.

The results are reported in Table 3, with the first column showing the results of the baseline estimates (repeated from Table 2, column 5) for ease of comparison. The estimates indicate that a strategic rivalry has a larger negative impact on bilateral trade in three cases relative to the average impact across all rivalry types. Based on the combined coefficients reported in the last row, the results in column 3 imply that the presence of a spatial rivalry reduces bilateral trade on average by $1 - exp(-0.364) = 30.51$ percent; column 4 indicates that an interventionary rivalry has an even larger negative impact of $1 - exp(-0.441) = 35.66$ percent; and the negative effect of an ideological rivalry (column 5) is the strongest at $1 - exp(-0.601) = 45.17$ percent. For each, the estimated coefficient on rivalry type is significant, though only marginally so for the interventionary type. Wald tests show that the combined coefficients for these three rivalry types are significant at the 1 percent level. Because we control for mutual membership in the Eastern bloc, these findings are

not driven by Cold War alignments.

Table 3: Gravity Results - Rivalry Types

	Dependent variable: Aggregate Bilateral Trade Flows, 1950-2019							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Base	Positional	Spatial	Interventionary	Ideology	Principal	Asymmetric	GDP Asym.
FTA	0.121***	0.121***	0.120***	0.121***	0.121***	0.121***	0.121***	0.120***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.022)
GATT / WTO	-0.084	-0.087	-0.085	-0.088	-0.088	-0.085	-0.084	-0.074
	(0.061)	(0.061)	(0.060)	(0.061)	(0.061)	(0.061)	(0.061)	(0.067)
Current colony	0.376*	0.376*	0.376*	0.376*	0.376*	0.376*	0.376*	0.212
	(0.206)	(0.206)	(0.206)	(0.206)	(0.206)	(0.206)	(0.206)	(0.168)
Active conflict	-0.514***	-0.393***	-0.388***	-0.336***	-0.539***	-0.496***	-0.465***	-0.302**
	(0.115)	(0.107)	(0.099)	(0.111)	(0.122)	(0.120)	(0.126)	(0.128)
Rivalry	-0.190**	-0.359***	-0.072	-0.159	-0.141	-0.214**	-0.118	-0.119
	(0.090)	(0.095)	(0.106)	(0.097)	(0.096)	(0.108)	(0.101)	(0.090)
Defense alliance	0.348***	0.349***	0.348***	0.349***	0.348***	0.349***	0.348***	0.323***
	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.062)
Eastern bloc	1.216***	1.216***	1.216***	1.214***	1.199***	1.216***	1.218***	1.403***
	(0.177)	(0.176)	(0.177)	(0.176)	(0.178)	(0.176)	(0.176)	(0.242)
Positional rivalry		0.190						
		(0.135)						
Spatial rivalry			-0.292**					
			(0.120)					
Interventionary rivalry				-0.282*				
				(0.149)				
Ideological rivalry					-0.460***			
					(0.176)			
Principal rivalry						0.081		
						(0.142)		
Asymmetric rivalry							-0.141	
							(0.141)	
Asymmetry in GDP								0.002
								(0.019)
Rivalry × Asymmetry in GDP								-0.666*
								(0.391)
Combined coefficient	-	-0.169*	-0.364***	-0.441***	-0.601***	-0.133	-0.259**	-0.785**
		(0.098)	(0.088)	(0.115)	(0.146)	(0.117)	(0.126)	(0.388)
N	1849208	1849208	1849208	1849208	1849208	1849208	1849208	1313214

Notes: Poisson PML with three-way (exporter-time, importer-time, and exporter-importer) fixed effects. Standard errors clustered by exporter- importer pair. Significance levels are indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Asymmetry in GDP is coded as an indicator equal to 1 if the absolute difference in log GDPs for that pair of countries is larger than the observed median absolute difference in log GDPs.

The only type of rivalry that does not appear to have a statistically larger negative effect than other rivalry types is the positional type, defined as a rivalry over status and prestige. Specifically, as shown in column 2 of Table 3, the combined coefficient for this type of rivalry is -0.169, which is slightly less negative than the estimate we found for all rivalry types combined but still marginally significant. The coefficient on the rivalry indicator itself in column 2, meanwhile, is negative and statistically significant at the 1 percent level, implying that rivalries that are *not* positional reduce bilateral trade on average by $1 - exp(-0.359) = 30.16$ percent. These findings reinforce the results shown in columns 3–5.

Columns 6 and 7 in Table 3 examine if the effects differ for rivalries coded by Thompson et al. (2022) as either "principal" rivalries or "asymmetric" rivalries. The latter two classifications are separate from the rivalry types used to construct the rivalry extent variable. Rather than relating to the nature of the issues the rivalry entails, these indicators reflect more about the countries

themselves and the broader contours of their relationship. A principal rivalry occurs when each country considers the other to be its main rival. An asymmetric rivalry refers to when one country is more intensely focused on the other than vice versa. While these considerations are interesting to think about, the estimated effects on these indicators do not differ significantly from zero, though the combined coefficient for an asymmetric rivalry is negative and statistically significant at the 5 percent level. As another type of asymmetry, column 8 considers whether rivalries have a bigger impact on trade when rivals are sufficiently different in size, drawing in part on the theoretical results of Garfinkel et al. (2022).[15] For this experiment, we use real (PPP-adjusted) GDP from the Penn World Table to construct an indicator for whether the absolute value of the log difference in GDPs between the two countries lies above its observed sample median.[16] Broadly consistent with the arguments of Garfinkel et al. (2022), we find that rivalries have much larger negative effects for country pairs that are sufficiently asymmetric in size. However, the coefficient estimate for this latter interaction effect is only significant at the 10 percent level on account of its relatively large standard error.

Results by time period. In addition to examining how the type and extent of a rivalry impact trade, we also consider whether the relationship between rivalries and trade is stable over different time periods. To that end, we divide our data into time periods based on the dominant foreign policy stances. We first divide our data set (1950–2019) into two main periods: the Cold War, lasting from 1950 to 1989, and the Post Cold War, lasting from 1990 to 2019.[17] We further subdivide the Cold War into Early (1950–1971) and Late (1972–1989) periods and take the years 2001–2019 (the latter part of the Post Cold War sample) as a distinct period we designate the "War on Terror." Finally, we consider the 1985–1995 time period separately (End Cold War) to study whether the link between rivalry and trade was different during the transition from the Cold War, as trade flows began to open up between the Western and Eastern bloc and as the countries in each orbit started to adopt more independent foreign policies.

The results are shown in Table 4, with column 1 reporting the full-sample results (taken from column 5 of Table 2) again for ease of comparison. The top panel of Table 4 presents results of regressions using only the binary rivalry variable and our main set of controls, while the bottom panel reports the results when including both the binary rivalry variable as well as the rivalry extent interaction term. We omit coefficient estimates for the control variables in the bottom panel for conciseness. Looking first at the Cold War years, the estimated coefficient on the binary rivalry variable in column 2 shows that a strategic rivalry is significantly associated with reduced bilateral trade during the Cold War, with a slightly larger effect in the Late Cold War years (column 4) as compared with the Early Cold War years (column 3): $1 - exp(-1.056) = 65.22$

[15] See footnote 2.

[16] That is, we first compute the absolute value of the difference between the log GDP of the exporter and that of the importer and then take the median over the sample. The median value turns out to be about 2.1; thus, for a pair to be above this threshold, the larger country's GDP must be more than 8 times larger than the smaller one's.

[17] The Berlin Wall fell in November, 1989. In December, 1989, George H. W. Bush and Mikhail Gorbachev declared the end of the Cold War at the Malta summit.

Table 4: Gravity Results - By Time Period

	Dependent variable: Aggregate Bilateral Trade Flows						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	All years	Cold War	Early Cold War	Late Cold War	Post Cold War	End Cold War	War on Terror
	1950-2019	1950-1989	1950-1971	1972-1989	1990-2019	1985-1995	2001-2019
FTA	0.121***	0.304***	0.336***	0.220***	0.068***	0.255***	0.084***
	(0.021)	(0.045)	(0.057)	(0.037)	(0.022)	(0.039)	(0.021)
GATT / WTO	-0.084	-0.050	-0.163***	-0.098*	0.106*	-0.040	0.111**
	(0.061)	(0.053)	(0.045)	(0.053)	(0.063)	(0.045)	(0.054)
Current colony	0.376*	1.179***	0.589***	0.368	0.096		
	(0.206)	(0.139)	(0.078)	(0.315)	(0.085)		
Active conflict	-0.514***	-0.326*	-0.522***	0.030	-0.558***	-0.162	-0.625***
	(0.115)	(0.187)	(0.173)	(0.229)	(0.128)	(0.132)	(0.139)
Rivalry	-0.190**	-1.388***	-0.809***	-1.056***	-0.040	-0.315***	0.158*
	(0.090)	(0.234)	(0.256)	(0.215)	(0.080)	(0.107)	(0.084)
Defense alliance	0.348***	0.067	0.360***	-0.034	0.287***	0.270***	0.005
	(0.059)	(0.060)	(0.101)	(0.050)	(0.060)	(0.074)	(0.148)
Eastern bloc	1.216***	1.892***	3.594***	-0.061	0.305	0.683***	
	(0.177)	(0.537)	(0.540)	(0.146)	(0.361)	(0.142)	
Add interaction with rivalry extent							
Rivalry	0.382*	0.342	2.392***	-2.221***	0.321	-0.262	0.727***
	(0.204)	(0.672)	(0.517)	(0.592)	(0.213)	(0.344)	(0.212)
Extent (0-4)	-0.377***	-0.926***	-1.392***	0.777**	-0.256**	-0.025	-0.420***
	(0.107)	(0.306)	(0.245)	(0.304)	(0.116)	(0.175)	(0.118)
N	1849208	704691	250742	367806	993529	249845	636229

Notes: Poisson PML with three-way (exporter-time, importer-time, and exporter-importer) fixed effects. Standard errors clustered by exporter-importer pair. Significance levels are indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The results shown in the lower panel of the table are obtained from separate regressions that include all the same covariates shown in the upper panel but also include extent.

percent versus $1 - exp(-0.809) = 55.47$ percent. Column 2 shows that active conflict is associated with a statistically significant decline in trade during the Cold War as a whole, but the estimated coefficients for the two subsamples indicates that the negative relationship was driven largely by the earlier subsample. Column 2 also shows that FTAs and colonial relationships have a positive relationship with bilateral trade during the full Cold War period, while GATT/WTO membership has a negligible effect.[18] Though a defense alliance and mutual membership in the Eastern bloc both have a positive relationship with trade when considering the Cold War period as a whole, the estimated coefficients for these two variables in columns 3 and 4 suggest they were more strongly related with trade during the earliy years of the Cold War, similar to what we see for most of the other covariates. For the years of transition from the Cold War (column 6), the results are quite similar to those for the Early Cold War years: a rivalry is associated with reduced trade, and an FTA, a defense alliance and membership in the Eastern bloc are all associated with increased trade.

When we include the rivalry extent variable in addition to the binary indicator in the bottom panel of Table 4, we find that expanding the dimension of a rivalry had an especially large negative impact on trade during the Cold War period.[19] Splitting this period up, however, suggests that

[18]For our colony variable, note that we are not able to identify an effect in some of the later time periods due to a lack of variation. The general finding that the effect of a colonial relationship declines over time is consistent with Head et al. (2010).

[19]The combined coefficient estimates for one-, two-, three-, and four-dimensional rivalries are respectively -0.584, -1.510, -3.120 and -3.362. The latter three are statistically significant at the 1 percent level; the former is not significant.

this strong association is largely driven by the data in the Early Cold war years (column 3); while the effect of having a rivalry on bilateral trade is negative and significant in the latter part of this period (column 4), the effect of extending a rivalry to 3 or more dimensions is now positive. For the years of transition from the Cold War (column 6), the negative and significant coefficient for rivalry suggests that the decline in the number of rivalries during this period played a constructive role in the general expansion of trade around this time.

Turning to the Post Cold War period (column 5), the estimated coefficients show the effects of membership in an FTA, a defense alliance, and the Eastern bloc remain positive, but the effects are smaller and are statistically insignificant for membership in the Eastern bloc. It is also notable that mutual GATT/WTO membership now has a positive effect on bilateral trade ($exp(0.106) - 1 = 10.06$ percent), with significance at the 10 percent level. The effect of a strategic rivalry on trade seems to dissipate. Although the effect remains negative, it is no longer statistically significant. Nonetheless, based on the combined coefficients for the rivalry indicator and the rivalry extent interaction term, extending a rivalry to 2 or more dimensions has a significantly negative effect on trade, notably consistent with what we find for the Cold War period as well as for the sample as a whole.

The results for the War on Terror years (2001-2019), reported in column 7 of Table 4, are particularly striking. For this period, a strategic rivalry is actually associated on average with $1 - exp(0.158) = 17.12$ percent *more* bilateral trade and is statistically significant at the 10 percent level. However, adding the extent rivalry variable to the specification shows that extending a rivalry to 3 dimensions or more reduces trade and significantly so, again consistent with what we find for other periods.[20]

Industry-level results. A strategic rivalry might impact trade for a number of different reasons. Two rival countries may try to avoid revealing sensitive technologies to each other; firms may reduce risk exposure by shifting supply chains away from rival countries; consumers may reduce purchases as an expression of patriotism. Examining the impact of rivalries on specific industries or sectors can provide some insight into these possible motivations. Table 5 shows that the existence of any strategic rivalry between a country pair has a statistically significant negative impact on bilateral trade for three of the industry groupings we consider—namely, consumer goods (column 3), parts and accessories (column 4), and semiconductors (column 10).[21] Though the latter estimate is significant only at the 10 percent level, it is economically large compared to our earlier estimates even without considering the extent or type of rivalry. Semiconductor trade according to our industry definitions includes semiconductors (cold cathode or photocathode valves and tubes, diodes, and transistors) and machines used to manufacture semiconductors and integrated circuits,

[20] For the 2001-2019 period, the combined coefficients for rivalries with 3 and 4 dimensions are respectively -0.533 and -0.953. Both are significant at the 1 percent level.

[21] The results reported in column 1 for total trade are based on the UN COMTRADE data; these estimates should be viewed as a baseline for comparison with our main results that use IMF DOTS supplemented with Gleditsch (2002)'s data, as reported earlier in columns 5 and 8 of Table 2.

Table 5: Industry-Level Gravity Results, 1962-2019

	(1) UN data (all trade)	(2) Capital goods	(3) Consumer Goods	(4) Parts & Accessories	(5) Computer-intensive	(6) "Proprietary capital"-intensive	(7) R&D-intensive	(8) Energy-related trade	(9) Aerospace trade	(10) Semi-conductor trade
Main sample										
FTA	0.111***	0.050*	0.041	0.126***	0.035	0.111***	0.045*	0.099*	-0.072	-0.089
	(0.020)	(0.029)	(0.041)	(0.029)	(0.028)	(0.027)	(0.024)	(0.053)	(0.075)	(0.067)
GATT / WTO	-0.227***	-0.225**	0.090	-0.111	-0.328***	-0.330***	-0.433***	-0.158	1.073**	-0.332
	(0.069)	(0.105)	(0.083)	(0.078)	(0.078)	(0.101)	(0.121)	(0.116)	(0.432)	(0.236)
Current colony	0.398**	0.393	0.566***	0.136	0.421**	0.539***	0.508**	0.930***	1.247***	0.326**
	(0.164)	(0.274)	(0.161)	(0.116)	(0.168)	(0.123)	(0.228)	(0.159)	(0.394)	(0.155)
Active conflict	-0.450***	-0.776***	-0.283	-0.288***	-0.581***	-0.229*	-0.402***	-0.589	-1.409**	-0.709**
	(0.116)	(0.151)	(0.173)	(0.099)	(0.142)	(0.138)	(0.106)	(0.369)	(0.617)	(0.280)
Rivalry	-0.181**	0.145	-0.158**	-0.175**	-0.137	-0.068	-0.016	-0.255	0.313	-0.572*
	(0.089)	(0.104)	(0.080)	(0.075)	(0.096)	(0.090)	(0.096)	(0.329)	(0.375)	(0.311)
Defense alliance	0.196***	0.183***	0.224***	0.315***	0.251***	0.419***	0.149*	0.067	0.728***	0.204
	(0.064)	(0.067)	(0.065)	(0.057)	(0.066)	(0.064)	(0.078)	(0.227)	(0.222)	(0.184)
Eastern bloc	0.326	1.700***	0.866***	0.185	1.174***	0.184	1.010***	0.448	3.447***	3.462***
	(0.200)	(0.355)	(0.228)	(0.175)	(0.288)	(0.204)	(0.333)	(0.292)	(0.894)	(0.968)
Main sample - with rivalry extent										
Rivalry	0.352*	0.140	0.065	0.363*	0.095	0.396	-0.056	0.964	1.071	2.083***
	(0.195)	(0.226)	(0.208)	(0.196)	(0.241)	(0.265)	(0.239)	(0.685)	(0.714)	(0.339)
Extent (0-4)	-0.355***	0.004	-0.154	-0.344***	-0.154	-0.291*	0.027	-0.859**	-0.726*	-1.573***
	(0.106)	(0.136)	(0.110)	(0.104)	(0.137)	(0.159)	(0.136)	(0.377)	(0.393)	(0.186)
N	1328112	1227450	1315358	1304402	1291435	1274800	1287076	1080178	550991	645149

Notes: Poisson PML with three-way (exporter-time, importer-time, and exporter-importer) fixed effects. Standard errors clustered by exporter- importer pair. Significance levels are indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. The results shown in the lower panel of the table are obtained from separate regressions that include all the same covariates shown in the upper panel but also include extent.

which are critical in military and national security as well as in civilian applications. That the negative impact on trade in this specific industry is so strong suggests that government preferences and policy could be a large contributing factor. That trade in parts and accessories sees a reduction in the presence of an extensive rivalry may be attributed, at least partially, to firms trying to limit their exposure to supply chain risk, while the negative effect found for consumer goods suggests consumer sentiment may also play a role.

When we include both the existence and extent of the rivalry in our estimation, we find that extending rivalries to two or more types also has a significantly negative impact on bilateral trade in energy-related goods (column 8) as well as in parts and accessories (column 4) and semiconductors (column 10). The negative effect on trade in energy-related goods, like that on trade in parts and accessories, could be due to firms attempting to reduce the supply chain risk they face, or it could also be due to governments restricting critical supplies. The effect of increasing rivalry extent for consumer goods is negative as well, but it is not statistically significant.[22] We also do not find a significant effect on trade for R&D-intensive goods, which would seem to contradict the notion that the desire to protect technology and know-how should be especially relevant in the presence of a more extensive rivalry. In any case, just as we find that a rivalry's impact on bilateral trade varies across rivalry type and time periods, Table 5 reveals variation in the impact by industry.

The estimates shown in Table 6 reveal considerable variation in the industry results across time periods as well. The Cold War period (row 1) exhibits a strong and negative association between

[22] We should add here, however, that the estimates reported in the last rows for the consumer goods imply combined coefficients that indicate extending a rivalry to 2 or more dimensions does have a statistically significant negative effect.

Table 6: Industry-Level Gravity Results - By Time Period

	(1) UN data (all trade)	(2) Capital goods	(3) Consumer Goods	(4) Parts & Accessories	(5) Computer-intensive	(6) "Proprietary capital"-intensive	(7) R&D-intensive	(8) Energy-related trade	(9) Aerospace trade	(10) Semi-conductor trade
Cold War, 1962-1989										
Active conflict	0.089	-0.233	-0.307*	0.223	-0.059	0.146	0.001	0.428**	-0.551**	-0.924**
Rivalry	-0.922***	-1.415***	-1.012***	-0.999***	-0.984***	-0.973***	-1.030**	-0.157	-2.531***	-0.294
Defense alliance	-0.177**	-0.011	-0.116**	-0.100	-0.057	-0.040	0.010	-0.164	0.468	-0.007
Early Cold War, 1962-1971										
Active conflict	-0.236	-0.302	-0.031	-0.361*	-0.281**	-0.226	-0.428**	-0.198	-3.770***	-1.055
Rivalry	-0.258**	0.209	-0.309***	-0.240**	-0.162	-0.104	-0.013	0.654	0.313	0.842**
Defense alliance	0.045	0.067	0.198**	0.149	0.210**	0.329***	0.093	-0.163	-0.771*	-0.806**
Late Cold War, 1972-1989										
Active conflict	0.069	-0.488**	-0.301*	0.103	-0.141	-0.022	-0.140	0.486**	-0.381	-0.580*
Rivalry	-0.840***	-1.509***	-0.819***	-0.913***	-0.945***	-0.904***	-1.007**	-0.197	-2.576**	-0.354
Defense alliance	-0.176**	0.009	-0.075	-0.083	-0.026	-0.023	-0.002	-0.232	0.469	0.011
Post Cold War, 1990-2019										
Active conflict	-0.431***	-0.878***	-0.207	-0.367***	-0.602***	-0.290**	-0.408***	-0.798**	-0.971	-0.820***
Rivalry	-0.040	0.223**	-0.112	-0.052	-0.097	0.077	0.067	-0.002	0.479	-0.478
Defense alliance	0.229***	0.124	0.199**	0.315***	0.191**	0.415***	0.070	0.285*	1.292***	0.445**
End Cold War, 1985-1995										
Active conflict	-0.125	-0.078	-0.041	-0.068	-0.080	0.001	0.026	-0.248	-0.396	-0.315
Rivalry	-0.356***	-0.711***	-0.126	-0.286**	-0.637***	-0.432***	-0.625***	-0.650***	-0.043	-0.804***
Defense alliance	0.159	0.441**	0.238*	0.023	0.118	0.128	0.259**	0.008	0.354	-0.025
War on terror, 2001-2019										
Active conflict	-0.489***	-0.946***	-0.449***	-0.413***	-0.709***	-0.379***	-0.446***	-0.646*	-2.459***	-2.051***
Rivalry	0.150*	0.320**	0.253**	0.067	0.110	0.187*	0.198*	0.014	1.647***	1.174***
Defense alliance	-0.303**	-0.719***	-0.071	0.084	0.095	-0.020	-0.469**	-0.488	-0.003	-1.664***

Notes: Poisson PML with three-way (exporter-time, importer-time, and exporter-importer) fixed effects. Standard errors clustered by exporter-importer pair. Significance levels are indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

the presence of a rivalry and bilateral trade in nearly all industries (the exceptions being the energy-related and semiconductor industries). These associations appear to be more pronounced in the Late Cold War years (row 3) than in the Early Cold War years (row 2) and even increase in scope to include both the energy-related and semiconductor industries during years of transition from the Cold War (row 5). Yet, during the Post Cold War period (row 6), the negative association between a rivalry and bilateral trade appears only in the semiconductor industry. Perhaps more strikingly, the last set of estimates for the War on Terror period reveal a *positive* association between the presence of a rivalry and bilateral trade for all industries, though the effect is not significant for the parts and accessories, the computer-intensive and the energy-related industry groupings.

Further results. In view of the variation in the estimated effects of rivalries on bilateral trade across time periods, we now turn to study how the timing of rivalries and war influence those effects. Table 7 reports a number of interesting results in this regard. The specification in column 1 adds an indicator for a recent conflict within 10 years. The estimated coefficient is positive, but not statistically different from zero, suggesting that recent active conflict does not have any lingering negative effects on trade. Column 2 adds an indicator for future conflict (also within 10 years). The estimated coefficient is negative and statistically significant at the 5 percent level. Consistent with how we interpret our estimates for the rivalry variables, this finding suggests either that deteriorating relations or the expectations of future conflict decrease bilateral trade independently of the effects of current conflict. The estimated effect of a rivalry, meanwhile, remains almost

Table 7: More results

Dependent variable: Aggregate Bilateral Trade Flows							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
FTA	0.121***	0.121***	0.114***	0.114***	0.121***	0.143***	0.146***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)
GATT / WTO	-0.084	-0.097	-0.079	-0.079	-0.086	-0.094	-0.099
	(0.061)	(0.059)	(0.061)	(0.061)	(0.061)	(0.072)	(0.073)
Colony	0.376*	0.376*	0.375*	0.375*	0.376*	1.009***	0.992***
	(0.206)	(0.207)	(0.206)	(0.206)	(0.206)	(0.161)	(0.169)
Active conflict	-0.487***	-0.743***	-0.625***	-0.625***	-0.480***	-0.530***	-0.536***
	(0.139)	(0.191)	(0.123)	(0.123)	(0.117)	(0.115)	(0.114)
Recent conflict (within 10 years)	0.189						
	(0.224)						
Rivalry	-0.195**	-0.192**	-0.042	-0.049	-0.235**	-0.151*	-0.150*
	(0.091)	(0.090)	(0.076)	(0.154)	(0.103)	(0.087)	(0.086)
Defense alliance	0.346***	0.352***	0.350***	0.350***	0.349***	0.296***	0.300***
	(0.059)	(0.059)	(0.059)	(0.059)	(0.059)	(0.064)	(0.064)
Eastern bloc	1.217***	1.217***	1.213***	1.213***	1.214***	1.136***	1.133***
	(0.177)	(0.177)	(0.177)	(0.177)	(0.177)	(0.180)	(0.183)
Future conflict (within 10 years)		-0.317**					
		(0.146)					
Longstanding rivalry (after 10 year mark)			-0.249***	-0.249***			
			(0.056)	(0.056)			
Rivalries that last at least 10 years				0.007			
				(0.170)			
Renewed rivalry					0.180		
					(0.133)		
UN Voting - raw agreement						0.205***	
						(0.064)	
UN Voting - ideal point distance							-0.023*
							(0.013)
N	1849208	1849208	1849208	1849208	1849208	1435421	1423585

Notes: Poisson PML with three-way (exporter-time, importer-time, and exporter-importer) fixed effects. Standard errors clustered by exporter-importer pair. Significance levels are indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

unchanged.

The modified specifications in columns 3, 4, and 5 examine the timing of rivalries. In particular, column 3 adds an indicator for the presence of a long-standing rivalry that has already lasted 10 years, while column 4 includes an additional indicator for any rivalry that eventually lasts at least 10 years, including before its 10 year mark. The estimated coefficients on these indicators suggest that the decline in bilateral trade tends to materialize only after the rivalry has lasted for a considerable amount of time instead of immediately even if the rivalry turns out to be long-lasting. It is possible that this latter finding reflects how the duration of the rivalry affects firm expectations. Under this interpretation, when the rivalry has lasted long enough to be perceived as entrenched, firms may begin to view the dispute as less likely to be resolved quickly or peacefully and adjust their trade accordingly. Column 5 tests whether the resumption of an earlier rivalry has different effects than the first instance of rivalry, finding inconclusive results.

Columns 6 and 7 control for two different measures of foreign policy consonance between trading partners, both of which rely on UN General Assembly voting data from Bailey et al. (2017). Column 6 uses a simple average of UN voting agreement, while column 7 uses the absolute difference between countries' ideal points, calculated using UN voting data, along a single dimension.[23] In column 6, we see that countries that vote similarly at the UN General Assembly do tend to trade more on average. Specifically, two countries that always agree will, on average, trade 22.8 percent more than two countries that always disagree—an estimate that closely resembles that of Bosone and Stamato (2024). However, the rivalry variable remains negative and statistically significant, indicating that the impact of a strategic rivalry on trade is independent of UN voting patterns. Column 7, which instead uses the ideal point distance measure, produces similar results. Although the estimated coefficient on the rivalry variable is smaller in magnitude in columns 6 and 7 than our baseline estimate (repeated in column 1), it is important to clarify that this difference is driven primarily by the reduction in the sample rather than by the inclusion of the UN voting variables.[24] As we show in supplementary results that are provided in our Appendix, estimating the baseline model without UN voting on the same sample as columns 6 and 7 produces virtually the same coefficient estimate for rivalries, suggesting that the presence of a rivalry provides distinct information about the deterioration of bilateral relations. These supplementary results also show that our earlier results for rivalry extent are likewise unaffected by accounting for UN voting patterns.

Our last table, Table 8, includes some additional checks for robustness, focusing mostly on econometric concerns. Columns 1 and 2 apply bias corrections for the coefficient estimates and

[23]Each country's ideal point is estimated using an item response theory (IRT) model. The simple average of agreement can change either due to preference (foreign policy) changes or because the agenda (the content of the vote) changes; the ideal point method can distinguish policy changes from agenda changes (changes in the subject matter of the votes) as well as informative versus idiosyncratic votes (topics that are not informative about the ideal point dimension). Both the simple average of voting agreement and the ideal point estimate allow for three types of votes: yea, nay, or abstain. See Bailey et al. (2017) for additional details; also see Airaudo et al. (2025).

[24]We lose a little over 25 percent of observations when including the UN voting variable because our baseline specification includes data for a number of territories and other UN non-members such as the Netherlands Antilles, Greenland, Hong Kong, and Bermuda. In other cases, sovereign states included in our baseline data became UN members relatively recently (e.g. Zimbabwe was admitted in 1980, Switzerland in 2002).

Table 8: More results, continued

	Dependent variable: Aggregate Bilateral Trade Flows							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Bias corrected		Drop active conflicts		Clean controls		Lead variables	
Contemporaneous variables								
FTA	0.124***	0.122***	0.121***	0.120***	0.116***	0.116***	0.091***	0.091***
	(0.023)	(0.023)	(0.021)	(0.021)	(0.025)	(0.025)	(0.019)	(0.019)
GATT / WTO	-0.066	-0.069	-0.092	-0.094	-0.101	-0.102	-0.113**	-0.116**
	(0.067)	(0.066)	(0.061)	(0.061)	(0.069)	(0.069)	(0.048)	(0.048)
Colony	0.387	0.388	0.377*	0.377*	0.365	0.365	0.495***	0.495***
	(0.273)	(0.272)	(0.206)	(0.206)	(0.387)	(0.387)	(0.159)	(0.159)
Active conflict	-0.509***	-0.365***			-0.466**	-0.326**	-0.355***	-0.189**
	(0.135)	(0.110)			(0.184)	(0.150)	(0.101)	(0.082)
Rivalry	-0.189*	0.386*	-0.171*	0.333	-0.203*	0.383	-0.230***	0.328
	(0.099)	(0.229)	(0.090)	(0.208)	(0.108)	(0.279)	(0.088)	(0.201)
Extent		-0.377***		-0.336***		-0.383**		-0.376***
		(0.126)		(0.110)		(0.156)		(0.111)
Defense alliance	0.355***	0.355***	0.348***	0.346***	0.371***	0.372***	0.378***	0.373***
	(0.063)	(0.063)	(0.060)	(0.060)	(0.065)	(0.066)	(0.059)	(0.059)
Eastern bloc	1.228***	1.213***	1.218***	1.205***	1.128***	1.127***	1.349***	1.345***
	(0.189)	(0.191)	(0.177)	(0.179)	(0.177)	(0.177)	(0.208)	(0.206)
Lead (2 period ahead) variables								
FTA							0.039*	0.036*
							(0.021)	(0.020)
GATT / WTO							0.048	0.046
							(0.056)	(0.056)
Current colony							-0.139	-0.138
							(0.185)	(0.184)
Active conflict							-0.173**	-0.193***
							(0.075)	(0.066)
Rivalry							0.080***	0.167***
							(0.026)	(0.059)
Extent								-0.054
								(0.038)
Defense alliance							-0.053***	-0.050**
							(0.019)	(0.020)
Eastern bloc							0.224***	0.222***
							(0.061)	(0.061)
N	1849208	1849208	1845052	1845052	1849208	1849208	1806244	1806244

Notes: Poisson PML with three-way (exporter-time, importer-time, and exporter-importer) fixed effects. Standard errors clustered by exporter- importer pair. Significance levels are indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Columns 1 and 2 use bias corrections for PPML with three-way fixed effects developed in Weidner and Zylkin (2021). Columns 3 and 4 drop observations that currently have an active conflict or have had one in the last 10 years. Columns 5 and 6 use a two-step estimation procedure where the exporter-time and importer-time fixed effects are estimated in a prior step that uses only the pairs that have never had a rivalry. Standard errors for these columns are bootstrapped.

standard errors developed by Weidner and Zylkin (2021). Due to the increase in standard errors, our main rivalry variable in column 1 is significant at the 10 percent level rather than at the 5 percent level as we found earlier. Otherwise, our results remain very similar to those we found before, including for the importance of rivalry extent.

Columns 3 and 4 then drop all observations with an active conflict or that have had an active conflict in the last 10 years. The motivation for this experiment is to further demonstrate that our results for rivalries and rivalry extent are not being driven by conflicts or country pairs that are intermittently in conflict. By dropping these observations, we ward against the concern that conflicts between rivals—and, similarly, between rivals with a more extensive rivalry—might have larger trade effects than other conflicts, thereby biasing our estimates for the effects of rivalries. Though we again find that the overall effect of rivalries in column 3 becomes only marginally significant, our results after dropping these observations remain qualitatively similar to those we found originally.

Next, columns 5 and 6 address concerns raised in the difference-in-difference (DID) literature about potentially invalid comparisons between later-treated units and earlier-treated units (Borusyak et al., 2024; Goodman-Bacon, 2021). Though most of this literature focuses on two-way fixed effects models for standard panel data settings, the underlying concern that already-treated units can contaminate the estimation of counterfactual trends for not-yet-treated units applies to gravity settings as well (Nagengast and Yotov, 2025). In our three-way fixed effects gravity model in (1), when a pair's rivalry status changes, the counterfactual change in trade for that pair (i.e., in the absence of a status change) is predominantly modeled using the exporter-time and importer-time fixed effects α_{it} and γ_{jt}. Effectively, these fixed effects can be thought of as ensuring DID-type comparisons between pairs undergoing a change in rivalry status and other pairs that share a trade partner in common with the pairs undergoing the change in status, similar to the role that the time fixed effect plays in conventional panel data models. Therefore, we experiment with estimating these exporter-time and importer-time fixed effects separately in a prior step using only the pairs that never experience a change in rivalry status. In this way, pairs that begin or end rivalries in a prior year are not used as "controls" for pairs that begin or end rivalries in the current year.[25] The standard errors in this case are bootstrapped using a cluster-bootstrap. The results from this exercise suggest that, if anything, our baseline estimates are biased towards zero. Because the cluster-bootstrap standard errors we use are more conservative than our original ones, we once again find that the overall effect of rivalries reverts to being only marginally significant in column 5 despite the increase in its magnitude.

Finally, columns 7 and 8 test whether changes in trade occur before changes in the main

[25]That is, in the first step, we estimate an analogous model that includes all of the non-rivalry covariates, all of the exporter-time and importer-time fixed effects, and pair fixed effects for the country pairs that never experience a rivalry. Because rivalries only occur for a small share of the pairs in our data, we can still estimate the exporter-time and importer-time fixed effects precisely after excluding these pairs. Note this approach differs from that of Nagengast and Yotov (2025). Their methods are not applicable to the present setting because, unlike with FTAs and other similar gravity covariates, changes in rivalry status can go in either direction and are often short-lived rather than irreversible.

indicators used in the baseline model. The lead variables (2 years) for an active conflict, the presence of a rivalry, and belonging to a defense alliance are all significant. That the anticipation of a future conflict negatively impacts current bilateral trade and significantly so is consistent with our finding in column 2 of Table 7. Somewhat surprisingly, the estimated coefficient on a future defense alliance is significantly negative rather than positive. Perhaps even more surprisingly, the estimated coefficient on a future rivalry is positive and significant at the 1 percent level. One possible interpretation is that the anticipation of a future rivalry induces firms to stock up on imported inputs whereby they can reduce their possible exposure to future supply-chain risk. Consequently, the coefficient on the contemporaneous binary rivalry indicator becomes more negative when this prior increase in trade is accounted for. As shown in column 8, there are no differences in anticipation effects for more or less extensive rivalries. Overall, these results support the interpretation that our earlier results for both rivalry status and rivalry extent are not driven by existing trends that precede changes in rivalry status.

4 Conclusion

When two countries see each other as possible threats, they are said to be engaged in a strategic rivalry. Because of the potential for military conflict to drastically and suddenly disrupt bilateral trade, firms may choose to preemptively reduce their trade with strategic rivals. In this case even the anticipation of a potential militarized conflict, whether or not such a conflict ever emerges, can be enough to impact trade flows between two countries.

We implement PPML estimation of a gravity model of trade with three-way fixed effects and find that a strategic rivalry between two countries does indeed reduce their bilateral trade flows. While the mere existence of a strategic rivalry does have a negative impact on trade flows, a rivalry along multiple dimensions has an even greater dampening effect on trade. Further, controlling for the presence of a strategic rivalry reduces the estimated effect of a military conflict on trade by roughly 35 percent, suggesting that at least some of the reduction in trade attributed to conflict is actually due to the antagonism within a rivalry and its associated risk of conflict. Our analysis reveals that ideological rivalries have the biggest negative impact on trade, and interventionary and spatial rivalries also have a notable negative impact. Positional rivalries, meanwhile, where two countries vie for a more prominent and influential position on the world stage, have a smaller dampening effect on trade versus these other types of rivalries.

Examining whether rivalries have their biggest impacts right away or over time, we find that trade between new rivals is initially resilient but experiences a significant decline once the rivalry becomes entrenched. And while strategic rivalries are a feature of international relations throughout the time period we consider (1950-2019), their negative impact on trade is felt primarily in the 20th century. At the industry level, rivalries have a significant negative impact on trade in semiconductors, energy-related goods, parts and accessories, and consumer goods.

While our analysis is focused on the country-level trade response to a rivalry between countries, underlying this response are firms' decisions about their imports and exports. Future research could use firm-level data to better understand the role of firm behavior in the trade response to strategic rivalries. For example, analyzing granular trade data (as in Kempf et al., 2025) would shed light on how firms weigh the conflict risks associated with rivalries when optimizing their supply chains and export revenues, including the circumstances under which they reduce trade with rival countries versus deciding to exit the market entirely.

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A Appendix

In this Appendix, we provide several additional results investigating how accounting for UN voting affects our main findings, building off the results shown in columns 6–7 of Table 7. In Table A.1, we first focus on the effects of restricting the sample to just the observations for which we have UN voting data. Column 1 provides the equivalent of column 5 of Table 2 for this restricted sample,

which includes only our rivalry variable plus our main set of controls, while column 2 adds rivalry extent, thus serving as the anologue of Table 2, column 8. In both cases, results are qualitatively similar to those we found for the full sample but modestly smaller in magnitude. Notably, the result for rivalry in column 1 of Table A.1 is nearly identical to those found in columns 6 and 7 of Table 7. As noted in the main text, this suggests that our rivalry variable conveys distinct information about the deterioration of bilateral relations on top of what can be discerned from UN voting patterns.

The remaining columns of Table A.1 then investigate in more detail how incorporating UN voting impacts our analysis. Since ideal point distance is the preferred measure of voting (dis)similarity used in Bailey et al. (2017), we present estimates for ideal point distance only, though we obtain similar results if we use raw agreement in voting. To facilitate comparisons, column 3 of Table A.1 repeats column 7 of Table 7 by adding ideal point distance to the baseline specification in column 1. Column 4 adds rivalry extent, enabling us to see that the estimated coefficient for the extent of a rivalry is insensitive to the inclusion of UN voting distance. Columns 5 and 6 then replace the raw ideal point distance measure with a dummy variable equal to 1 when voting distance exceeds its observed median. As columns 5 and 6 illustrate, this alternative distance variable is highly significant. It also provides a clear interpretation, suggesting that country pairs with high voting distance have 3.4 percent less trade than pairs that vote more similarly. It does not, however, affect the estimates that are found for rivalry by itself in column 5 or for rivalry together with extent in column 6.

Finally, columns 7 and 8 examine a slightly different question: do UN voting differences exacerbate the negative trade impact of rivalries? As shown by Gopinath et al. (2025) in the context of the Russia-Ukraine war, latent geopolitical differences can become more salient for trade at times of heightened tensions. Broadly translated to our context, that would mean that rivalries could have greater effects on trade when existing geopolitical differences, as measured by UN voting distance, are larger. However, when we interact our rivalry variable with our high UN voting distance indicator we actually find the opposite. One possible interpretation is that rivalries only have limited impacts on trade when bilateral relations are already frosty but have larger effects for countries that were previously more friendly. However, this last set of results should be interpreted with caution since we do not attempt to disentangle the timing of voting changes from the timing of rivalry status changes.

Table A.1: UN Voting - more results

Dependent variable: Aggregate Bilateral Trade Flows, 1950-2019								
Observations with UN voting data only								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
FTA	0.148***	0.147***	0.146***	0.144***	0.146***	0.145***	0.144***	0.143***
	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
GATT / WTO	-0.096	-0.098	-0.099	-0.101	-0.098	-0.100	-0.097	-0.099
	(0.072)	(0.072)	(0.073)	(0.072)	(0.073)	(0.072)	(0.072)	(0.072)
Current colony	1.014***	1.013***	0.992***	0.992***	0.993***	0.993***	0.994***	0.993***
	(0.162)	(0.162)	(0.169)	(0.169)	(0.170)	(0.170)	(0.169)	(0.169)
Active conflict	-0.540***	-0.425***	-0.536***	-0.419***	-0.532***	-0.419***	-0.528***	-0.423***
	(0.115)	(0.098)	(0.114)	(0.097)	(0.113)	(0.097)	(0.112)	(0.097)
Rivalry	-0.149*	0.286	-0.150*	0.289	-0.148*	0.283	-0.325***	0.106
	(0.086)	(0.203)	(0.086)	(0.204)	(0.086)	(0.203)	(0.092)	(0.212)
Rivalry extent (0-4)		-0.291***		-0.294***		-0.288***		-0.270**
		(0.111)		(0.111)		(0.110)		(0.110)
Defense alliance	0.311***	0.311***	0.300***	0.299***	0.304***	0.304***	0.304***	0.304***
	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)	(0.064)
Eastern bloc	1.230***	1.220***	1.133***	1.119***	1.188***	1.179***	1.184***	1.176***
	(0.179)	(0.180)	(0.183)	(0.184)	(0.179)	(0.180)	(0.179)	(0.179)
UN Voting: ideal point distance			-0.023*	-0.024*				
			(0.013)	(0.013)				
UN Voting: high IP distance					-0.034***	-0.034***	-0.039***	-0.038***
					(0.012)	(0.012)	(0.012)	(0.012)
Rivalry × high IP distance							0.200***	0.168**
							(0.078)	(0.075)
N	1435421	1435421	1435421	1435421	1435421	1435421	1435421	1435421

Notes: Poisson PML with three-way (exporter-time, importer-time, and exporter-importer) fixed effects. Standard errors clustered by exporter-importer pair. Significance levels are indicated as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. These results use only the observations for which data on UN voting patterns from Bailey et al. (2017) is available. High IP distance is an indicator variable equal to 1 if the ideal point distance in UN voting is above its observed median.