Sanctions and Trade Diversion

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1   Introduction

Economic Sanctions have become a major foreign policy tool in recent years, particularly for the United States. Determining the effectiveness of sanctions at inflicting economic damage is critical for designing sanctions which will achieve their stated goals. For example, sanctions placed on Iran were successful in that the regime there agreed to negotiations and later restrictions on their nuclear program because the sanctions were effective at stifling economic growth.

The use of sanctions has increased dramatically in the past few decades. Of the 1418 sanction cases recorded in the Threat and Imposition of Economic Sanctions database between 1945 and 2005, 800 of them occurred after 1990, with a wide variety of imposer countries. Although the United States is the greatest user of sanctions as a foreign policy tool, it only accounts for about 40% of all imposed sanction cases. Developed countries such as Germany, the United Kingdom and other European countries account for another 20%. The rest of the sanction cases come from developing economies like China, India and Saudi Arabia.

However, actual understanding of the potential damage caused by sanctions has been limited by access to data and/or naïve models of trade which suffer from the same endogeneity bias which drove the "border puzzle" in McCallum (1995). Anderson & Wincoop (2003) showed that this result was driven by the lack of multilateral resistance terms, measures of how remote a pair of countries are to the rest of the world's economic activity relative to each other. It is not just trade costs and distance between a pair of countries that determines bilateral trade flows between them, but also the trade costs and distances to every other potential trade partner. Failing to account for this will dramatically overstate the importance of borders and other country-pair specific trade barriers, including the impact of trade sanctions.

This paper will improve upon the literature by using a longer period dataset, finer categories of trade sanctions and properly specified gravity equations to show the true effect sanctions have on trade flows. The model developed will also deal with two potential issues which would hide the true effect of a sanction.

First I will deal with the issue of sanction threats, which can bias the impact of an imposed sanction downwards because the target country's trade is already reduced before the sanction is imposed. Second I will deal with the issue of trade diversion,

where the target country compensates for the loss in trade with the sanctioning country by trading more with its other partners. Finally, because these two problems logically would interact with each other (trade might be preemptively diverted as the result of a threat) I will combine both of them into a comprehensive model.

2   Literature Review

Determining the economic costs of sanctions has been done before as part of the literature on the success of sanctions in achieving their stated aims. Hufbauer & Oegg (2003) utilizes a cross-sectional gravity approach covering 178 countries in 1995 and 1999, as well as dummy variables for countries which were sanctioned during one of those years. This model is used to estimate the damage caused by economic sanctions econometrically, but the paper also includes a separate section of sanction impacts based on case studies performed previously.

Hufbauer & Oegg (2003) divides sanctions into three broad categories:

1. Extensive sanctions involving the total or near-total severing of economic ties, as was the case with the US-Cuba embargo.

2. Moderate sanctions involve asset freezes or specific import/export controls, or a combination of five or more limited sanctions.

3. Limited sanctions occur when four or less of the following light sanctions are used against a country: reduction or suspension of economic aid; reduction or suspension of military aid; export restrictions on arms or limited dual-use technologies; prohibition of credits or credit guarantees by the US Export-Import Bank, Overseas Private Investment Corporation, Commodity Credit Corporation, or US Trade and Development Agency; objections to loans from international financial institutions (e.g. World Bank); travel bans or visa restrictions; bans on the export or import of one or two goods; and diplomatic rebuffs.

They find that extensive sanctions reduces bilateral trade between the United States and the target country by 95-99%, almost completely eliminating both imports and exports. Moderate and limited sanctions have no statistically significant effect on trade however. These and earlier estimates of the impact of sanctions on trade used the naïve gravity model though, which all suffer from the same endogeneity bias that led to the border puzzle discovered by McCallum (1995) and explained in Anderson & Wincoop (2003). It also only examines two periods of cross sectional data and only examines US sanctions which were in place in 1995 and 1999.

Caruso (2005) was the original inspiration for this paper, because it uses a panel gravity model rather than the more typical cross sectional gravity model used in the sanction literature. He builds a panel gravity framework for bilateral trade between the United States and 49 partner countries over the period 1960-2000. Logged bilateral trade flows are regressed against the GDP of the two trading partners, the population of the two countries, distance between the countries and dummy variables indicating whether or not the reporter country was involved in war/civil war. However it does not include standard country fixed effects to account for multilateral resistance.

Caruso then augments their gravity model with dummy variables for "extensive" sanctions, the highest tier of the Hufbauer and Oegg (2003) categories, and "moderate" sanctions which covers everything else. He finds that limited/moderate sanctions have a positive but not statistically significant impact on bilateral trade flows, which he attributes to the low intensity of the sanction measures which may have negligible aggregate impact. However he does find that extensive sanctions, especially those undertaken by multiple countries alongside the United States, are extremely effective in disrupting bilateral trade, reducing it by nearly 90%. This result is consistent with the earlier work by Hufbauer & Oegg (2003).

He then tests the theory of trade diversion by building a new panel of data using the same 49 partner countries, but instead of trade between the partner countries and the United States this second panel has trade with between "the other G-7 countries" and targeted countries. Since the other G7 have economies broadly similar to the United States, targeted countries should be able to replace lost US trade with trade from these developed nations. Although extensive sanctions were still effective in reducing bilateral trade flows between G-7 and target countries, the more moderate sanctions had a positive and significant impact on trade between the G-7 and sanction targets. This provides evidence for the theory that in some cases the damage caused by economic sanctions is partially offset by trade shifting to other potential partners.

Frank (2017) is a recent working paper that estimates a panel gravity equation covering 185 countries from 1984-2005. The panel includes country-year and country-pair fixed effects, accounting for multilateral resistance, and studies the effect of regional trade agreements and sanctions on imports. His sanctions data comes from the TIES dataset, but he follows earlier research from Hufbauer & Oegg (2003) in aggregating the TIES set of 10 dummy variables describing different types of sanctions into three categories of sanctions: extensive (blockades and total economic embargos), moderate (partial embargoes, specific import and export restrictions and suspension of trade agreements) and limited (travel bans, termination of foreign aid and asset freezes).

He finds that extensive and limited sanctions have no significant effect on trade, but that moderate sanctions reduce trade between countries by 6-10%. This is in stark contrast to both Hufbuaer and Oegg (2003) and Caruso (2005), which find the opposite results. In previous studies, moderate sanctions had no significant effect while extensive sanctions reduce trade to almost zero. Here, extensive sanctions have no significant impact, while moderate sanctions do. He attributes the lack of significance among extensive sanctions to their rarity, and the fact that over his data period from 1984 – 2005 those most extreme cases were often imposed continuously, giving little or no variation to exploit. He also studies the effect of a sanction on third party countries, but does not find any significant evidence of trade diversion. This is again in contrast to Caruso (2005), which found evidence for trade diversion.

Finally, Afesorgbor (2016) is another recent working paper which uses a properly specified gravity model to examine the impact of sanctions on trade, specifically examining the impact of sanction threats. His data covers 1960-2009, with 169 target countries and 60 imposer countries, resulting in a combined 398 country pairs. His sanctions data

comes from the TIES dataset, which is used to analyze the effects of imposed sanctions, threatened sanctions and the differences in outcomes for each. He analyzes the reduction in imports from all 9 of the major categories of sanctions, and then analyzes the impact of threatening those same types of sanctions to compare how the two differ.

He finds that total economic embargoes reduces exports from the target by 80% and imports to the target by 91%, a result similar to Hafbuaer & Oegg (2003) and Caruso (2005). The impact of sanction threats depends on the type of threat being made. Threats of import controls leads to an increase in trade between the two countries by 28-34%, while other types of threats have no significant effect. Since the imposer country has much more control on what it imports, it is likely that these are seen as more credible threats compared to other types.

I will make two main contributions to this field. First, I will use a larger dataset than has been used previously. This will allow me to resolve conflicts in earlier research potentially caused by the dataset being too short to properly cover the longest, most intense sanctions. It will also allow me to do a more detailed analysis looking at the impact of different categories of sanctions, particularly the difference between import and export restrictions. Second, my model will result in a more complete view of the impact of sanctions than has been found before. By accounting for threats I will prevent the coefficients on sanction imposition being biased. By accounting for trade diversion I will find how much of the sanction damage is offset by trade with third parties. By accounting for both I will resolve potential issues each of these have individually and gain a more complete picture of the total impact sanctions have on trade.

3   Data

The dataset used in this paper is an imbalanced panel created by combining the Threat and Imposition of Economic Sanctions dataset, the Correlates of War Trade Dataset and the CEPII gravity dataset. The combined dataset contains information on 180 countries over the period 1948-2005, with a total of 15,335 country pairs. The total combined sample size of 850,745 country-pair-years, with the variable of interest for this paper will be the log of exports, which are recorded for both countries in a pair.

Data on sanctions comes from version 4.0 of the Threat and Imposition of Economic Sanctions (TIES) dataset, which scans legislation, government documents and proceedings and news articles to capture as many sanction threats and events as possible which began between 1945 and 2005. The dataset includes data as recent as 2013, however new sanctions stop being added after 2005 and so I use that as the end date for my data.

The TIES dataset divides imposed and threatened sanctions into 10 categories, of which I make use of 9. These sanctions are summarized in Table 1 below. The tenth category which I exclude here is a generic "other" category for cases which don't fit into any of the other designations. Because of the unusual nature of these events, and because there are only five such events in the dataset they are dropped from the analysis. Sanction threats have an additional "unspecified" threat category which is not analyzed here. Data is reported in terms of "sanction cases," defined as all of the sanctions

imposed or threatened by a country or group of countries on a target over a specific issue, which are transformed into a set of panel dummy variables for each type of threatened or imposed sanction

A limitation this imposes is that the data does not report data on the timeline of when specific sanctions or threats are made. Instead the dataset reports when a *sanctioncase* begins and ends. If a sanction regime starts as a travel ban, leads to import restrictions and later becomes an embargo the sanction case would begin at the imposition of the travel ban and end when the embargo is lifted. Dummy variables for travel ban, import restrictions and embargos associated with that sanction case and would all be coded 1 for the entire sanction case duration.

For a modern example, we can examine the recent sanctions against Iran. The United States and others have instituted numerous sanctions against Iran because of its nuclear weapon program over a period of years. All of those sanctions relating to Iran's nuclear program would be counted as a single sanction case. The United States also have sanctions against Iran for other actions in the region, such as its support for rebels, terrorist organizations and other groups. These foreign policy sanctions are unrelated to the issue of nuclear weapons, and thus would constitute a separate sanction case.

In order to avoid potential problems of endogeneity sanctions which are threatened or imposed due to trade or factors relating to trade are removed from the dataset for a total of 671 sanction cases. Of these 503 involved threats of sanctions while 398 cases resulted in sanctions actually being imposed. There are 273 sanction cases which end at the threat stage with no sanction being imposed and there are 168 cases of sanctions being imposed with little or no threat or warning before it.

The average duration of a sanction case is 4.2 years while sanction cases that lead to sanctions being imposed are slightly longer, averaging 4.6 years, with maximum duration varying drastically. Some sanction cases last only a few months, while other cases like the United State's embargo of Cuba span nearly the entire dataset, with a maximum duration of 46 years. More information about the coding and construction of the TIES dataset used here can be found in the Data Appendix.

Due to some of the categories of sanction being rare and to be more in line with previous literature the primary analysis will aggregate the 9 sanction categories into 3. These are intense sanctions (blockades and embargos), moderate sanctions (partial embargos, import restrictions and export restrictions) and light sanctions (travel bans, suspension of economic agreements, removal of foreign aid and asset freezes).

Trade data comes from version 4 of the Correlates of War Trade Dataset, which is based on the IMF's Direction of Trade Statistics and has bilateral trade flows for 205 countries over the period 1945 to 2005. This data is used because the COW trade data distinguishes between reported zeroes and dates where there is missing data/no trade reports in a given year. Because this analysis is concerned with trade sanctions it is expected that at least some of the time trade should be reduced to zero, and so the distinction between zero reported trade and no reported trade is important.

Finally, country characteristics data is drawn from the CEPII gravity dataset, a square panel of all country-pairs from 1948 to 2005. There is a conflict here where the

other datasets are available from 1945 on, but as discussed in the methodology section this is only utilized in cases where fixed effects are infeasible and are accounted for in robustness checks. This data includes distance between two countries, GDP, population, trade agreements, international organization membership and a dummy variable for conflict between a pair of countries.

4 Direct Impact of Sanctions on Trade

I will begin by setting up a gravity model of exports ($E_{i,j,t}$) from the exporting country (i) to the importing country (j) in year (t). I capture all trade flows by including country pairs (exports from country A to B) and the reverse (exports from country B to country A), which forms my variable Exports. The log of exports is my dependent variable for this analysis. Reported zeroes in the trade data are replaced with 1\$ so that they are not dropped from the dataset when taking the natural log.

The first step will be generating the simplest case, examining the effect of any sanction in general being imposed upon a target country. To do this two dummy variables are constructed for importer imposed and exporter imposed sanctions. For every country pair in a given year, if the importing country is the one imposing the sanction then the m-sanction variable will take on the value 1, with the same being true for cases of the exporting country imposing sanctions resulting in the x-sanction variable taking the value 1.

4.1 Impact of Imposed Sanctions

The first regression will be the baseline model, looking only at the effect of sanctions which were actually imposed. To capture the impact of sanctions there are two sets of nine sanction dummies, corresponding to the nine categories of sanctions described before, one to capture the effect on exports if the exporting country is imposing the sanction and the other to capture the effect on exports if the importing country is imposing the sanction. The analysis will use standard OLS regression with robust standard errors clustered at the country-pair level to analyze the following equation:

The model itself will be a panel gravity equation with country-year and country-pair fixed effects. Country-year fixed effects will control for GDP, population and other macroeconomic variables, while the country-pair fixed effect will control for multilateral resistance as described in Anderson & Wincoop (2003). The equation to be estimated is given below.

$$lnE_{i,j,t} = \alpha_{i,j} + \alpha_{i,t} + \alpha_{i,j,t} + \beta_1 X_{i,j,t} + \beta_2 M_{i,j,t}^{M} + \epsilon_{i,j,t} \qquad (1)$$

Where $E_{i,j,t}$ is the logged real value of exports and $\alpha_{i,j}$ are country-pair fixed effects which control for distance, borders, shared language/history and other variables describing the relationship between the countries. Country characteristics such as GDP, population and whether the country is at war which vary in each country by year are

controlled by $\alpha_{i,t}$ and $\alpha_{j,t}$, country-year fixed effects for the exporter/importer. These also control for multilateral resistance, which also vary by country and over time. The error term for a given country-pair year is given by $\epsilon_{i,j,t}$.

The variables $X_{i,j,t}$ and $M_{i,j,t}$ represent the dummy variables for whether there is any sort of sanction being imposed by the exporting country or the importing country in a given year. Since sanctions in general are meant to limit trade between nations it is expected that β_1 and β_2 will be negative and statistically significant. Otherwise, sanctions would either be completely ineffective or have the opposite effect to what the imposing country intends.

Table 1 shows that sanctions are associated with negative and significant coeficients, indicating that there are statistically and economically significant reductions in trade due to the presence of sanctions in general. Importer imposed sanctions are associated with larger decreases in trade, which is in line with theory and previous literature. It is easier to prevent goods entering a country compared to exiting, particularly from a political perspective. Exporter imposed sanctions in this analysis indicate that a country is attempting to prevent its firms from selling goods to the targeted country. This is directly harmful to the export sectors of the sanctioning country, and so carries a heavier political and economic burden. Conversely, restricting the purchase of goods from a target country will have economic costs to the sanctioning country but outside of certain critical goods the effect won't be as directly visible.

4.2 Heterogenous Sanction Effects

The next step will be to investigate the effect of different severity of sanctions will have on trade in the sanctioner-target pair. To do this sanctions are divided into three tiers: intense (blockades, embargoes), moderate (partial embargoes, import restrictions and export restrictions) and light (travel bans, asset freezes, suspension of economic agreement and termination of foreign aid). It is expected that more intense sanctions will have greater impacts on the trade between countries and so should have coefficients that are statistically and economically larger than less severe sanction types.

This requires the use of six dummy variables, divided into two vectors. One vector of dummy variables will be intense, moderate and light sanctions being imposed by the exporting country, and the other vector will be those same categories of sanctions being imposed by the importing country. This will be represented by the variables $C_{i,j,t}^X$ and $C_{i,j,t}^M$ respectively.

$$lnE_{i,j,t} = \alpha_{i,j} + \alpha_{i,t} + \alpha_{i,j,t} + \beta_1 C_{i,j,t}^X + \beta_2 C_{i,j,t}^M + \epsilon_{i,j,t} \qquad (2)$$

The impact is described in Table 2. Intense sanctions are economically significant in that they have the largest coefficients, with importer-imposed sanctions having slightly more impact. However these are not statistically significant at the 10% level. They are close though, with exporter imposed sanctions being significant at the 15% level and importer imposed sanctions being significant at the 12% level.

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Table 1: Impact of Imposed Sanctions

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE	(4) Full FE
Exporter Sanction	-0.842***	-0.950***	-1.346***	-0.103
	(0.246)	(0.247)	(0.167)	(0.158)
Importer Sanction	-0.366	-0.500*	-0.914***	-0.705***
	(0.287)	(0.287)	(0.207)	(0.176)
ln(Exporter GDP)	1.639***	1.709***	0.623***	
	(0.0110)	(0.0154)	(0.0193)	
ln(Importerr GDP)	1.331***	1.454***	0.368***	
	(0.0110)	(0.0155)	(0.0193)	
ln(Exporter Pop.)	0.102***	0.0462**	0.819***	
	(0.0183)	(0.0191)	(0.0752)	
ln(Importerr Pop.)	-0.0299*	-0.0917***	0.678***	
	(0.0179)	(0.0186)	(0.0753)	
Exporter War	-0.244***	-0.275***	-0.316***	
	(0.0317)	(0.0314)	(0.0222)	
Exporter Civil War	-0.267***	-0.251***	-0.110***	
	(0.0129)	(0.0130)	(0.00980)	
Importer War	-0.134***	-0.191***	-0.235***	
	(0.0332)	(0.0328)	(0.0224)	
Importer Civil War	-0.256***	-0.242***	-0.0998***	
	(0.0129)	(0.0129)	(0.00997)	
Border	1.184***	1.307***		
	(0.210)	(0.219)		
ln(Capital Distance)	-2.298***	-2.218***		
	(0.0425)	(0.0451)		
EIA	-0.000233	-0.000264	0.00252***	0.00262***
	(0.000387)	(0.000387)	(0.000294)	(0.000475)
ln(Importer Remoteness)		-0.561***	0.840***	
		(0.0452)	(0.0455)	
ln(Exporter Remoteness)		-0.173***	1.266***	
		(0.0416)	(0.0444)	
Constant	-38.78***	-30.11***		
	(0.588)	(0.944)		
Observations	852,481	852,481	852,481	852,469
R-squared	0.484	0.485	0.704	0.757
Country_Pair FE	NO	NO	YES	YES
Country_Year FE	NO	NO	NO	YES

Country Pair Clustered Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

What is revealed is that the driving force for the difference observed in Table 1 between importer and export imposed sanctions is being driven by the different in moderate sanctions. Importer imposed moderate sanctions are much more economically and statistically significant, with a log-linear coefficient of -0.617 which is significant at the 5% level.

Light sanctions appear to have little impact on trade overall, which is in keeping with theory and previous findings.

The $\beta1$'s are expected to be negative, but with decreasing magnitude as the type of sanction becomes less severe. An exception to this could be import controls, where the imposing country refuses to import certain goods or services from the targeted country. This should theoretically leave the exports from the imposer country to the targeted country unaffected, but I include it here to account for potential spillover effects that the policy might have.

The $\beta2$'s are expected to be negative, following the same general pattern as the coefficients on the $\beta1$'s but with the potential exception being export controls, where the imposer country refuses to sell to the targeted country.

There should be no reason for sanctions to increase trade between two partners, so these results require some sort of explanation. A potential problem in estimation is that these three sanction types are not utilized on their own very often, and the actual impact on exports of these sanctions might be relatively small. World events might be overwhelming the effect of the sanctions leading to them appearing to increase exports. The fact there is such a small sample of these to draw inference from is a concern and so these results are viewed with skepticism at this time.

It is also possible that there is some sort of interaction with sanction threats or trade diversion caused by the imposition of sanctions that is causing these odd results, which will be explored in the following sections.

4.3 The Impact of Sanction Threats

The second model used in this analysis augments the first by adding an additional two vectors of dummy variables, representing threats of a given type of sanction by an importer/exporter. This is done both to analyze the effect of sanction threats on exports and also to control for potential problems when estimating the impact of imposed sanctions. If there is significant trade disruption because of sanction threats, that might bias the impact of imposed sanctions.

$$lnE_{i,j,t} = \alpha_{i,j} + \alpha_{i,t} + \alpha_{j,t} + \beta_1 S_{i,j,t}^X + \beta_2 S_{i,j,t}^M + \beta_3 T_{i,j,t}^X + \beta_4 T_{i,j,t}^M + \epsilon_{i,j,t} \qquad (3)$$

Where $T_{i,j,t}^X$ is a vector of 3 dummy variables which take the value of 1 if the exporting country is threatening to impose intense/moderate/light sanctions on the importing country in year t and $T_{i,j,t}^M$ is a vector of 3 dummy variables which take the value of 1 if the exporting country is the target of threats of that type of sanction from the importing country in year t.

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Table 2: Heterogeneous Sanction Impacts

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE	(4) Full FE
Intense Exporter Sanction	-2.581***	-2.706***	-1.619***	-0.355
	(0.953)	(0.952)	(0.617)	(0.611)
Moderate Exporter Sanction	-1.031***	-1.092***	-0.906***	0.0188
	(0.255)	(0.255)	(0.205)	(0.190)
Light Exporter Sanction	1.205***	1.130***	-0.830***	-0.0162
	(0.328)	(0.330)	(0.272)	(0.222)
Intense Importer Sanction	-3.867***	-3.907***	-2.952***	-0.922
	(1.129)	(1.125)	(0.769)	(0.760)
Moderate Importer Sanction	-0.721***	-0.823***	-0.599**	-0.648***
	(0.251)	(0.253)	(0.239)	(0.206)
Light Importer Sanction	2.075***	1.986***	-0.0202	-0.0213
	(0.323)	(0.321)	(0.309)	(0.239)
ln(Exporter GDP)	1.639***	1.710***	0.623***	
	(0.0110)	(0.0154)	(0.0193)	
ln(Importerr GDP)	1.331***	1.453***	0.367***	
	(0.0110)	(0.0155)	(0.0193)	
ln(Exporter Pop.)	0.101***	0.0453**	0.823***	
	(0.0183)	(0.0191)	(0.0752)	
ln(Importerr Pop.)	-0.0299*	-0.0917***	0.683***	
	(0.0179)	(0.0185)	(0.0753)	
Exporter War	-0.247***	-0.277***	-0.316***	
	(0.0317)	(0.0314)	(0.0222)	
Exporter Civil War	-0.267***	-0.251***	-0.109***	
	(0.0129)	(0.0129)	(0.00980)	
Importer War	-0.137***	-0.194***	-0.235***	
	(0.0332)	(0.0327)	(0.0224)	
Importer Civil War	-0.256***	-0.242***	-0.0996***	
	(0.0129)	(0.0129)	(0.00997)	
Border	1.189***	1.311***		
	(0.209)	(0.217)		
ln(Capital Distance)	-2.300***	-2.220***		
	(0.0424)	(0.0450)		
EIA	-0.000234	-0.000264	0.00253***	0.00262***
	(0.000387)	(0.000387)	(0.000294)	(0.000475)
ln(Importer Remoteness)		-0.561***	0.838***	
		(0.0452)	(0.0455)	
ln(Exporter Remoteness)		-0.173***	1.263***	
		(0.0416)	(0.0443)	
Constant	-38.74***	-30.06***		
	(0.587)	(0.944)		
		10		
Observations	852,481	852,481	852,481	852,469
R-squared	0.484	0.486	0.704	0.757
Country_Pair FE	NO	NO	YES	YES
Country_Year FE	NO	NO	NO	YES

Country Pair Clustered Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

It is expected that the β_3's and β_4's are going to be generally positive, decreasing in size as the sanctions become less severe. This would capture a "rush to buy" effect where consumers and firms attempt to stock up on international goods before the sanctions are actually imposed, giving a temporary bump in trade after sanctions are threatened.

The results of this regression are summarized in Table 4 (I've come up with a succinct way to summarize this, it's just time consuming to do. Will send completed version of tables soon). Compared to model 1 the coefficients on the imposed sanctions do not change in statistical or economic significance. Additionally, sanction threats don't generally seem to be statistically significant.

4.4 The Impact of Heterogeneous Threats

5 Sanctions and Trade Diversion

In addition to measuring the direct impact of sanctions on trade between the sanctioner and target pair, it is important to evaluate whether there is evidence of third party countries increasing trade with the target country. This trade diversion would undermine the economic damage caused by the sanction and lessen its effectiveness, and accounting for this is important for sanction regime construction.

5.1 Imposed Sanctions and Trade Diversion

In order to capture the effect of exporters under a sanction attempting to find new customers and the effect of importers under sanction looking for new sources of goods, two vectors of dummy variables are created to account for the other trade partners which are importing to or receiving exports from countries targeted by sanctions. However, any attempt to account for trade diversion this way requires that country-year fixed effects be replaced with direct measures of economic activities as dummy variables which include the country that imposes the sanction as well as all other countries would be captured within the country-year fixed effect.

In order to deal with this we need a new question which is based upon model 1 but without the country-year fixed effects.

$$ lnE_{i,j,t} = \alpha_{i,j} + \alpha_1 X_{i,t} + \alpha_2 X_{j,t} + \beta_1 S_{i,j,t}^X + \beta_2 S_{i,j,t}^M + \beta_3 D_{i,t}^X + \beta_4 D_{j,t}^M + \epsilon_{i,j,t} \quad (4) $$

Where $\alpha_{i,j}$ remains country-pair fixed effects to control for non-changing characteristics such as distance between the two countries, the X 's are country characteristics: GDP, population, area, WTO membership, EU membership and a dummy variable for conflict.

The first variable used to study the effect of trade diversion, $D_{i,t}^X$ is a vector of 9 dummies which take on the value of 1 if the exporting country is the target of a given type of sanction in year t. This will capture the trade diversion of the exporter attempting to shift their exports from the imposer country to third party buyers. The

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Table 3: Impact of Sanction Threats

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE	(4) Full FE
Exporter Sanction	-0.948***	-1.051***	-1.334***	-0.138
	(0.255)	(0.256)	(0.169)	(0.160)
Importer Sanction	-0.566*	-0.688**	-0.979***	-0.721***
	(0.300)	(0.300)	(0.213)	(0.181)
Exporter Threat	0.678***	0.646***	-0.149	0.359***
	(0.238)	(0.237)	(0.151)	(0.119)
Importer Threat	1.572***	1.479***	0.578***	0.134
	(0.262)	(0.263)	(0.150)	(0.145)
ln(Exporter GDP)	1.638***	1.709***	0.624***	
	(0.0110)	(0.0154)	(0.0193)	
ln(Importerr GDP)	1.330***	1.453***	0.368***	
	(0.0110)	(0.0155)	(0.0193)	
ln(Exporter Pop.)	0.101***	0.0461**	0.819***	
	(0.0183)	(0.0191)	(0.0752)	
ln(Importerr Pop.)	-0.0302*	-0.0918***	0.679***	
	(0.0179)	(0.0186)	(0.0753)	
Exporter War	-0.246***	-0.276***	-0.316***	
	(0.0317)	(0.0314)	(0.0222)	
Exporter Civil War	-0.267***	-0.251***	-0.110***	
	(0.0129)	(0.0129)	(0.00980)	
Importer War	-0.136***	-0.193***	-0.235***	
	(0.0332)	(0.0327)	(0.0224)	
Importer Civil War	-0.256***	-0.241***	-0.0997***	
	(0.0129)	(0.0129)	(0.00997)	
Border	1.182***	1.304***		
	(0.210)	(0.219)		
ln(Capital Distance)	-2.298***	-2.219***		
	(0.0425)	(0.0450)		
EIA	-0.000232	-0.000263	0.00252***	0.00262***
	(0.000387)	(0.000387)	(0.000294)	(0.000475)
ln(Importer Remoteness)		-0.559***	0.840***	
		(0.0452)	(0.0455)	
ln(Exporter Remoteness)		-0.172***	1.265***	
		(0.0416)	(0.0444)	
Constant	-38.74***	-30.08***		
	(0.588)	(0.944)		
Observations	852,481	852,481	852,481	852,469
R-squared	0.484	0.485	0.704	0.757
Country_Pair FE	NO	NO	YES	YES
Country_Year FE	NO	NO	NO	YES

Country Pair Clustered Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: Impact of Heterogeneous Threats

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE	(4) Full FE
Intense Exporter Sanction	-2.603***	-2.723***	-1.734***	-0.406
	(0.953)	(0.951)	(0.625)	(0.619)
Moderate Exporter Sanction	-1.187***	-1.240***	-0.923***	-0.00189
	(0.260)	(0.260)	(0.204)	(0.190)
Light Exporter Sanction	1.239***	1.164***	-0.776***	-0.0378
	(0.334)	(0.336)	(0.278)	(0.227)
Intense Importer Sanction	-3.825***	-3.867***	-2.990***	-0.998
	(1.137)	(1.133)	(0.784)	(0.776)
Moderate Importer Sanction	-0.904***	-0.995***	-0.638***	-0.652***
	(0.259)	(0.261)	(0.241)	(0.206)
Light Importer Sanction	1.990***	1.909***	-0.0731	-0.0339
	(0.330)	(0.327)	(0.316)	(0.245)
Intense Exporter Threat	-0.154	-0.264	1.402**	1.036**
	(0.874)	(0.883)	(0.577)	(0.468)
Moderate Exporter Threat	1.356***	1.292***	0.193	0.222
	(0.358)	(0.350)	(0.174)	(0.137)
Light Exporter Threat	-0.549***	-0.529**	-0.600***	0.236
	(0.207)	(0.217)	(0.190)	(0.178)
Intense Importer Threat	0.670	0.589	1.501*	1.850**
	(1.114)	(1.126)	(0.881)	(0.729)
Moderate Importer Threat	1.454***	1.371***	0.284*	-0.0362
	(0.366)	(0.361)	(0.167)	(0.173)
Light Importer Threat	0.694**	0.629**	0.530***	0.0685
	(0.271)	(0.277)	(0.188)	(0.175)
EIA	-0.000234	-0.000264	0.00252***	0.00262***
	(0.000387)	(0.000387)	(0.000294)	(0.000475)
ln(Importer Remoteness)		-0.559***	0.838***	
		(0.0452)	(0.0455)	
ln(Exporter Remoteness)		-0.173***	1.263***	
		(0.0416)	(0.0443)	
Constant	-38.71***	-30.05***		
	(0.587)	(0.944)		
Observations	852,481	852,481	852,481	852,469
R-squared	0.484	0.486	0.704	0.757
Country_Variables	YES	YES	YES	NO
Country_Pair FE	NO	NO	YES	YES
Country_Year FE	NO	NO	NO	YES

Country Pair Clustered Robust standard errors in parentheses

Country controls include gdp, population, distance and a border dummy.

*** p<0.01, ** p<0.05, * p<0.1

second variable dealing with trade diversion, $D_{j,t}^M$ is a vector 9 dummy variables which take the value of 1 if the importing country is under a given type of sanction in year t. This will capture the ability of the targeted country to buy from third party countries when they are being sanctioned.

The signs of $\beta 3$ and $\beta 4$ are expected to be positive, indicating that being under a sanction will increase trade with countries in general. Third party countries will try to take advantage of the trade distortion the sanction causes, either selling at higher prices or buying at lower prices. The coefficients on $\beta 1$ and $\beta 2$ will become even more negative, as the total effect of a sanction on trade between the sanctioning country and target country will be $\beta 1 + \beta 4$ for exporter imposed sanctions and $\beta 2 + \beta 3$ for importer imposed sanctions.

5.2 Heterogeneous Sanctions and Trade Diversion

5.3 Threats and Trade Diversion

$$lnE_{i,j,t} = \alpha_{i,j} + \alpha_{i,t} + \alpha_{j,t} + \beta_1 S_{i,j,t}^X + \beta_2 S_{i,j,t}^M + \beta_3 T_{i,j,t}^X + \beta_4 T_{i,j,t}^M \tag{5}$$

$$+\beta_5 D_{i,t}^X + \beta_6 D_{j,t}^M + \beta_7 TD_{i,t}^X + \beta_8 TD_{j,t}^M + \epsilon_{i,j,t}$$

6 Conclusion

7 Appendix and Tables

7.1 TIES Data Construction

Although the TIES dataset is an excellent resource for drawing from a wide variety of documents and finding sanction cases for a large number of countries there are times where judgements must be made to make use of the data. One of the more important of these are cases where it is unclear when a sanction case ends. Cases where an end date is missing could indicate either the sanction was still ongoing as of the latest update or that the end date is unknown. To attempt to control for this I use other data available in the dataset to try and give a specified end date. In 66 cases where the end date is not stated, I insert an available "ongoing as of" date which is a variable that indicates the most recent news story found that mentioned the sanction. In the 33 cases that the end date is unlisted and there is no ongoing as of date then it is assumed that the sanction case continues through the full after this I insert December 31st, 2005 to correspond with a sanction case which was ongoing as of the end of my dataset.

It is important to note here that the specifications using country-year fixed effects precludes the inclusion of sanctions or threats where all of a country's trade partners target it at once, which would be rolled up into the country-year fixed effects. The model depends on within-year variation in sanctions, so the most extreme cases will be dropped but these are exceedingly rare.

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Table 5: Sanctions and Trade Diversion

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE
Exporter Sanction	-0.589**	-0.704***	-1.260***
	(0.245)	(0.246)	(0.168)
Importer Sanction	-0.192	-0.349	-0.933***
	(0.286)	(0.287)	(0.209)
Exporter Diversion	-0.493***	-0.459***	-0.156***
	(0.0389)	(0.0388)	(0.0270)
Importer Diversion	-0.340***	-0.280***	0.0463*
	(0.0389)	(0.0388)	(0.0268)
ln(Exporter GDP)	1.668***	1.725***	0.620***
	(0.0115)	(0.0156)	(0.0194)
ln(Importerr GDP)	1.369***	1.482***	0.378***
	(0.0115)	(0.0158)	(0.0194)
ln(Exporter Pop.)	0.109***	0.0562***	0.821***
	(0.0183)	(0.0192)	(0.0750)
ln(Importerr Pop.)	-0.0161	-0.0741***	0.689***
	(0.0180)	(0.0187)	(0.0752)
Exporter War	-0.226***	-0.257***	-0.322***
	(0.0315)	(0.0312)	(0.0221)
Exporter Civil War	-0.270***	-0.255***	-0.110***
	(0.0129)	(0.0129)	(0.00980)
Importer War	-0.102***	-0.158***	-0.224***
	(0.0330)	(0.0325)	(0.0224)
Importer Civil War	-0.260***	-0.247***	-0.101***
	(0.0129)	(0.0129)	(0.00997)
Border	1.191***	1.304***	
	(0.210)	(0.218)	
ln(Capital Distance)	-2.289***	-2.216***	
	(0.0425)	(0.0450)	
EIA	-0.000127	-0.000170	0.00255***
	(0.000386)	(0.000385)	(0.000294)
ln(Importer Remoteness)		-0.539***	0.837***
		(0.0452)	(0.0456)
ln(Exporter Remoteness)		-0.138***	1.277***
		(0.0416)	(0.0445)
Constant	-40.18***	-32.01***	
	(0.611)	(0.967)	
Observations	852,481	852,481	852,481
R-squared	0.485	0.486	0.704
Country_Controls	YES	YES	YES
Country_Pair FE	NO	NO	YES
Country_Year FE	NO	NO	NO

Country Pair Clustered Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Heterogeneous Sanctions and Trade Diversion

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE
Intense Exporter Sanction	-1.596*	-1.565*	-0.846
	(0.937)	(0.936)	(0.616)
Moderate Exporter Sanction	-1.045***	-1.125***	-0.865***
	(0.248)	(0.247)	(0.203)
Light Exporter Sanction	1.835***	1.733***	-0.575**
	(0.325)	(0.327)	(0.268)
Intense Importer Sanction	-2.875**	-2.835**	-2.250***
	(1.120)	(1.115)	(0.766)
Moderate Importer Sanction	-0.742***	-0.877***	-0.590**
	(0.246)	(0.246)	(0.239)
Light Importer Sanction	2.549***	2.410***	0.0384
	(0.320)	(0.317)	(0.307)
Intense Exporter Div.	-0.906***	-1.083***	-0.951***
	(0.106)	(0.105)	(0.0740)
Moderate Exporter Div.	-0.000536	0.0384	-0.0575*
	(0.0415)	(0.0409)	(0.0319)
Light Exporter Div.	-0.955***	-0.923***	-0.329***
	(0.0461)	(0.0462)	(0.0330)
Intense Importer Div.	-0.945***	-1.025***	-0.872***
	(0.103)	(0.102)	(0.0742)
Moderate Importer Div.	0.0899**	0.144***	0.0403
	(0.0403)	(0.0397)	(0.0310)
Light Importer Div.	-0.789***	-0.740***	-0.117***
	(0.0452)	(0.0457)	(0.0336)
EIA	-1.65e-05	-6.18e-05	0.00253***
	(0.000385)	(0.000384)	(0.000295)
ln(Importer Remoteness)		-0.591***	0.795***
		(0.0452)	(0.0456)
ln(Exporter Remoteness)		-0.155***	1.246***
		(0.0413)	(0.0443)
Constant	-38.54***	-29.56***	
	(0.611)	(0.945)	
Observations	852,481	852,481	852,481
R-squared	0.490	0.491	0.705
Country_Controls	YES	YES	YES
Country_Pair FE	NO	NO	YES
Country_Year FE	NO	NO	NO

Country Pair Clustered Robust standard errors in parentheses

Country controls include gdp, population, distance and a border dummy.

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Sanction Threats and Trade Diversion

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE
Exporter Sanction	-0.686***	-0.798***	-1.242***
	(0.254)	(0.255)	(0.170)
Importer Sanction	-0.383	-0.534*	-0.996***
	(0.300)	(0.300)	(0.214)
Exporter Threat	0.545**	0.450*	-0.245
	(0.242)	(0.241)	(0.152)
Importer Threat	1.439***	1.301***	0.499***
	(0.264)	(0.264)	(0.150)
Exporter Diversion	-0.502***	-0.478***	-0.173***
	(0.0395)	(0.0394)	(0.0273)
Importer Diversion	-0.350***	-0.297***	0.0314
	(0.0393)	(0.0392)	(0.0272)
Exporter Threat Div.	0.0753**	0.161***	0.113***
	(0.0294)	(0.0293)	(0.0201)
Importer Threat Div.	0.0833***	0.141***	0.0983***
	(0.0279)	(0.0277)	(0.0205)
EIA	-0.000129	-0.000175	0.00255***
	(0.000385)	(0.000385)	(0.000294)
ln(Importer Remoteness)		-0.550***	0.827***
		(0.0455)	(0.0457)
ln(Exporter Remoteness)		-0.149***	1.266***
		(0.0418)	(0.0447)
Constant	-39.99***	-31.44***	
	(0.616)	(0.977)	
Observations	852,481	852,481	852,481
R-squared	0.485	0.486	0.704
Country_Controls	YES	YES	YES
Country_Pair FE	NO	NO	YES
Country_Year FE	NO	NO	NO

Country Pair Clustered Robust standard errors in parentheses
Country controls include gdp, population, distance and a border dummy.
*** p<0.01, ** p<0.05, * p<0.1

Table 8: Impact of Heterogeneous Threats

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE	(4) Full FE
Intense Exporter Sanction	-2.603***	-2.723***	-1.734***	-0.406
	(0.953)	(0.951)	(0.625)	(0.619)
Moderate Exporter Sanction	-1.187***	-1.240***	-0.923***	-0.00189
	(0.260)	(0.260)	(0.204)	(0.190)
Light Exporter Sanction	1.239***	1.164***	-0.776***	-0.0378
	(0.334)	(0.336)	(0.278)	(0.227)
Intense Importer Sanction	-3.825***	-3.867***	-2.990***	-0.998
	(1.137)	(1.133)	(0.784)	(0.776)
Moderate Importer Sanction	-0.904***	-0.995***	-0.638***	-0.652***
	(0.259)	(0.261)	(0.241)	(0.206)
Light Importer Sanction	1.990***	1.909***	-0.0731	-0.0339
	(0.330)	(0.327)	(0.316)	(0.245)
Intense Exporter Threat	-0.154	-0.264	1.402**	1.036**
	(0.874)	(0.883)	(0.577)	(0.468)
Moderate Exporter Threat	1.356***	1.292***	0.193	0.222
	(0.358)	(0.350)	(0.174)	(0.137)
Light Exporter Threat	-0.549***	-0.529**	-0.600***	0.236
	(0.207)	(0.217)	(0.190)	(0.178)
Intense Importer Threat	0.670	0.589	1.501*	1.850**
	(1.114)	(1.126)	(0.881)	(0.729)
Moderate Importer Threat	1.454***	1.371***	0.284*	-0.0362
	(0.366)	(0.361)	(0.167)	(0.173)
Light Importer Threat	0.694**	0.629**	0.530***	0.0685
	(0.271)	(0.277)	(0.188)	(0.175)
ln(Exporter GDP)	1.639***	1.709***	0.623***	
	(0.0110)	(0.0154)	(0.0193)	
ln(Importerr GDP)	1.330***	1.452***	0.366***	
	(0.0110)	(0.0155)	(0.0193)	
ln(Exporter Pop.)	0.101***	0.0452**	0.823***	
	(0.0183)	(0.0191)	(0.0752)	
ln(Importerr Pop.)	-0.0302*	-0.0919***	0.683***	
	(0.0179)	(0.0185)	(0.0753)	
Exporter War	-0.247***	-0.277***	-0.315***	
	(0.0317)	(0.0314)	(0.0222)	
Exporter Civil War	-0.267***	-0.251***	-0.110***	
	(0.0129)	(0.0129)	(0.00980)	
Importer War	-0.138***	-0.195***	-0.235***	
	(0.0331)	(0.0327)	(0.0224)	
Importer Civil War	-0.255***	-0.241***	-0.0996***	
	(0.0129)	(0.0129)	(0.00997)	
Border	1.183***18	1.305***		
	(0.209)	(0.218)		
ln(Capital Distance)	-2.301***	-2.221***		
	(0.0424)	(0.0449)		
EIA	-0.000234	-0.000264	0.00252***	0.00262***
	(0.000387)	(0.000387)	(0.000294)	(0.000475)
ln(Importer Remoteness)		-0.559***	0.838***	
		(0.0452)	(0.0455)	
ln(Exporter Remoteness)		-0.173***	1.263***	
		(0.0416)	(0.0443)	

Table 9: Heterogeneous Sanctions and Trade Diversion

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE
Intense Exporter Sanction	-1.596*	-1.565*	-0.846
	(0.937)	(0.936)	(0.616)
Moderate Exporter Sanction	-1.045***	-1.125***	-0.865***
	(0.248)	(0.247)	(0.203)
Light Exporter Sanction	1.835***	1.733***	-0.575**
	(0.325)	(0.327)	(0.268)
Intense Importer Sanction	-2.875**	-2.835**	-2.250***
	(1.120)	(1.115)	(0.766)
Moderate Importer Sanction	-0.742***	-0.877***	-0.590**
	(0.246)	(0.246)	(0.239)
Light Importer Sanction	2.549***	2.410***	0.0384
	(0.320)	(0.317)	(0.307)
Intense Exporter Div.	-0.906***	-1.083***	-0.951***
	(0.106)	(0.105)	(0.0740)
Moderate Exporter Div.	-0.000536	0.0384	-0.0575*
	(0.0415)	(0.0409)	(0.0319)
Light Exporter Div.	-0.955***	-0.923***	-0.329***
	(0.0461)	(0.0462)	(0.0330)
Intense Importer Div.	-0.945***	-1.025***	-0.872***
	(0.103)	(0.102)	(0.0742)
Moderate Importer Div.	0.0899**	0.144***	0.0403
	(0.0403)	(0.0397)	(0.0310)
Light Importer Div.	-0.789***	-0.740***	-0.117***
	(0.0452)	(0.0457)	(0.0336)
ln(Exporter GDP)	1.637***	1.701***	0.626***
	(0.0117)	(0.0160)	(0.0194)
ln(Importerr GDP)	1.332***	1.456***	0.378***
	(0.0116)	(0.0160)	(0.0194)
ln(Exporter Pop.)	0.137***	0.0793***	0.875***
	(0.0183)	(0.0191)	(0.0744)
ln(Importerr Pop.)	0.0156	-0.0472**	0.748***
	(0.0179)	(0.0185)	(0.0746)
Exporter War	-0.208***	-0.241***	-0.321***
	(0.0314)	(0.0310)	(0.0218)
Exporter Civil War	-0.264***	-0.248***	-0.108***
	(0.0128)	(0.0128)	(0.00976)
Importer War	-0.0835**	-0.142***	-0.223***
	(0.0327)	(0.0323)	(0.0223)
Importer Civil War	-0.251***	-0.237***	-0.0974***
	(0.0128)	(0.0127)	(0.00995)
Border	1.146***	1.267***	
	(0.206)	(0.215)	
ln(Capital Distance)	-2.304***	-2.224***	
	(0.0418)	(0.0444)	
EIA	-1.65e-05	-6.18e-05	0.00253***
	(0.000385)	(0.000384)	(0.000295)
ln(Importer Remoteness)		-0.591***	0.795***
		(0.0452)	(0.0456)
ln(Exporter Remoteness)		-0.155***	1.246***
		(0.0413)	(0.0443)

Table 10: Sanction Threats and Trade Diversion

VARIABLES	(1) Naive Grav.	(2) Grav. w/ MRW	(3) MRW w/ FE
Exporter Sanction	-0.686***	-0.798***	-1.242***
	(0.254)	(0.255)	(0.170)
Importer Sanction	-0.383	-0.534*	-0.996***
	(0.300)	(0.300)	(0.214)
Exporter Threat	0.545**	0.450*	-0.245
	(0.242)	(0.241)	(0.152)
Importer Threat	1.439***	1.301***	0.499***
	(0.264)	(0.264)	(0.150)
Exporter Diversion	-0.502***	-0.478***	-0.173***
	(0.0395)	(0.0394)	(0.0273)
Importer Diversion	-0.350***	-0.297***	0.0314
	(0.0393)	(0.0392)	(0.0272)
Exporter Threat Div.	0.0753**	0.161***	0.113***
	(0.0294)	(0.0293)	(0.0201)
Importer Threat Div.	0.0833***	0.141***	0.0983***
	(0.0279)	(0.0277)	(0.0205)
ln(Exporter GDP)	1.664***	1.722***	0.621***
	(0.0116)	(0.0157)	(0.0194)
ln(Importerr GDP)	1.365***	1.477***	0.378***
	(0.0115)	(0.0157)	(0.0194)
ln(Exporter Pop.)	0.110***	0.0557***	0.814***
	(0.0184)	(0.0192)	(0.0750)
ln(Importerr Pop.)	-0.0157	-0.0747***	0.682***
	(0.0180)	(0.0186)	(0.0752)
Exporter War	-0.227***	-0.259***	-0.323***
	(0.0315)	(0.0312)	(0.0221)
Exporter Civil War	-0.270***	-0.254***	-0.110***
	(0.0129)	(0.0129)	(0.00980)
Importer War	-0.104***	-0.161***	-0.226***
	(0.0330)	(0.0325)	(0.0224)
Importer Civil War	-0.259***	-0.245***	-0.101***
	(0.0129)	(0.0128)	(0.00997)
Border	1.186***	1.299***	
	(0.210)	(0.218)	
ln(Capital Distance)	-2.291***	-2.218***	
	(0.0425)	(0.0450)	
EIA	-0.000129	-0.000175	0.00255***
	(0.000385)	(0.000385)	(0.000294)
ln(Importer Remoteness)		-0.550***	0.827***
		(0.0455)	(0.0457)
ln(Exporter Remoteness)	20	-0.149***	1.266***
		(0.0418)	(0.0447)
Constant	-39.99***	-31.44***	
	(0.616)	(0.977)	
Observations	852,481	852,481	852,481
R-squared	0.485	0.486	0.704
Country_Controls	YES	YES	YES
Country_Pair FE	NO	NO	YES
Country_Year FE	NO	NO	NO

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