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The empirical consequences of trade sanctions for directly and indirectly affected countries

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Economic sanctions are a popular diplomatic tool for countries to enforce political demands abroad or to punish non-complying countries. There is an ongoing debate in the literature if this tool is effective in reaching these goals. This paper adds to the literature by treating sanctions like a negative form of trade agreements. In order to quantify the direct effects of sanctions on the trade flows between countries I make use of a gravity equation controlling for country pair, importer-year, and exporter-year fixed effects. The estimates reveal that there is a significant decrease in the value of trade after the introduction of sanctions. In a second step, trade diversion is introduced as a potential instrument for countries to soften the negative impact of sanctions. However, the estimates reveal no evidence for trade diversion.

Keywords: gravity, international trade, trade sanctions

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Abstract

Economic sanctions are a popular diplomatic tool for countries to enforce political demands abroad or to punish non-complying countries. There is an ongoing debate in the literature if this tool is effective in reaching these goals. This paper adds to the literature by treating sanctions like a negative form of trade agreements. In order to quantify the direct effects of sanctions on the trade flows between countries I make use of a gravity equation controlling for country pair, importer-year, and exporter-year fixed effects. The estimates reveal that there is a significant decrease in the value of trade after the introduction of sanctions. In a second step, trade diversion is introduced as a potential instrument for countries to soften the negative impact of sanctions. However, the estimates reveal no evidence for trade diversion.

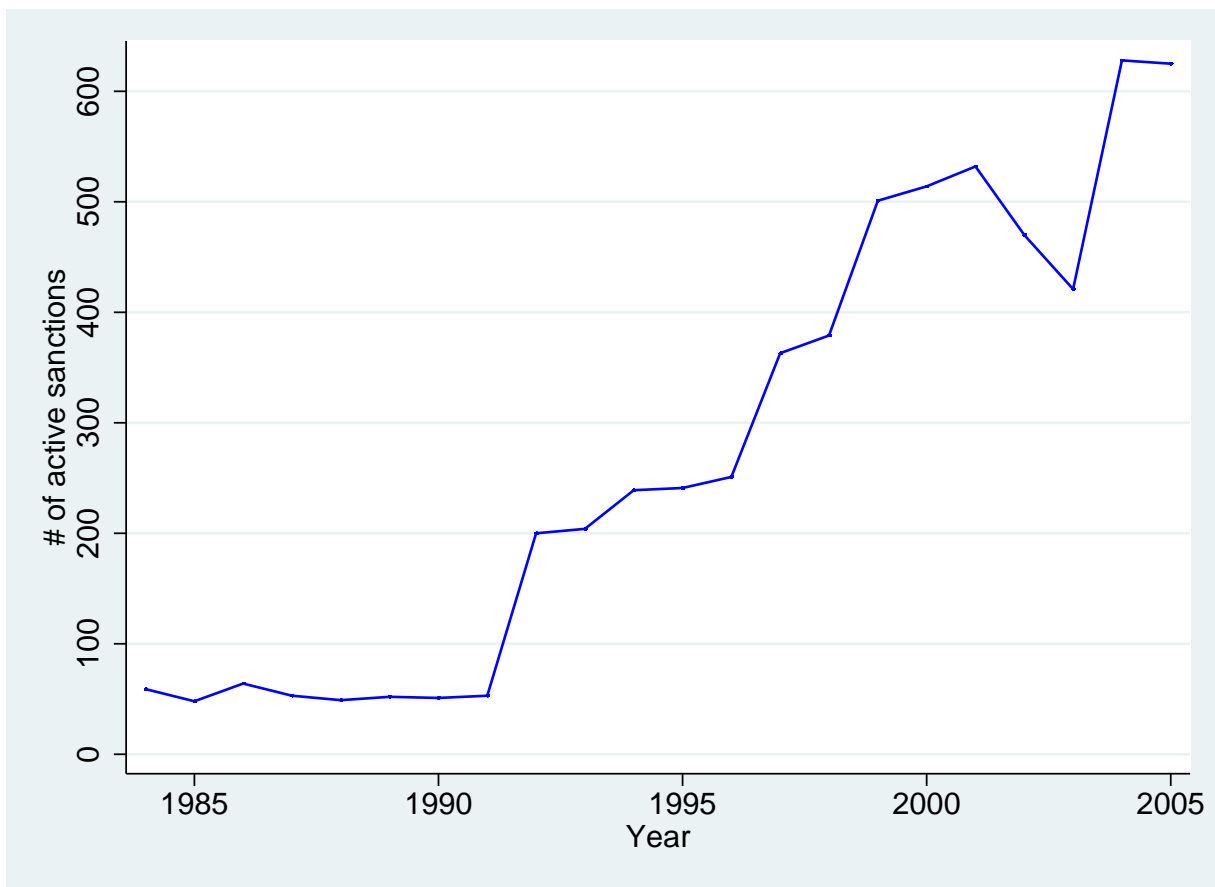
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1 Introduction

Trade sanctions and embargoes as an alternative to brute force have been popular instruments of diplomatic behavior against ill-behaving states since the beginning of the 20th century and continue to be popular today. After the annexation of the Crimea by the Russian Federation, the European Union (EU), the United States of America (USA), and several other states were quick to implement sanctions against Russia. Russia, in turn, reacted by implementing multilateral trade sanctions on its own, specifically, a total ban on food imports from the EU, North America, Norway and Australia. The basic idea behind these instruments can be summarized by a quote of US-President Wilson from 1919: *‘A nation that is boycotted is a nation that is in sight of surrender. Apply this economic, peaceful, silent, deadly remedy and there will be no need for force. It does not cost a life outside the nation boycotted, but it brings a pressure upon the nation which, in my judgment, no modern nation could resist’*. Figure 1 shows that the number of active economic sanctions has been at a rather steady level until 1990 but their usage has grown drastically after 1990, from under 100 to over 600 in just 15 years.

Figure 1: Number of sanctions per year



Source: Own calculation based on data by Hufbauer et al. (2009).

But are economic sanctions an effective tool of enforcing the goals of sender-countries? It has been shown that only about one in three sanctions yield the desired political outcome (Hufbauer et al., 2009). The question has also been widely discussed in the literature with very mixed results and, so far, inconclusive evidence. By taking a look at the world right now, sanctions do not seem to be very effective. Russia has not taken any steps to undo the annexation of the Crimea and North Korea keeps testing missiles, to name just two examples. Especially North Korea has been subjected to drastic sanctions from many countries across the globe for many years. With Wilson in hindsight, how is it possible to resist these sanctions? Two explanations come to mind. First, it is possible that economic sanctions simply do not yield the desired punishing effect by not reducing existing trade between countries. Secondly, it is possible that sanctioned countries are able to switch their trade partners with little costs, therefore circumventing the expected trade reduction.

This paper adds to the sanctions literature by linking it to the trade-creation and trade-diversion literature. I critically re-examine the results of previous researchers and increase the sample size in both, time- and country-pair-dimensions. In a first step, I quantify the effect of sanctions and potential counter-sanctions on international trade empirically by means of gravity equations with different specifications. I argue that the implementation of sanctions can be treated similarly to the formation of a regional trade agreement between two countries, but in the opposite direction. Instead of abolishing tariffs and streamlining standards to facilitate trade, it is possible to treat a sanction like the introduction of an infinitely high tariff that prevents countries from trading specific goods or from trading all together. The results show that sanctions indeed have a significant negative impact on the aggregate trade values between countries but at a lower level than previously concluded.

Since I am interested in consequences for indirectly affected countries, in a second step I control for the possibility of trade diversion. If sanctioned and sanctioning countries are able to simply divert their trade value to other partners at little cost, then this can potentially offset the negative sanctions mechanism. Also, if the targeted country can divert trade more easily than the sender, it may lead to cases where the punishing country suffers more economic damage than the country that is supposed to be punished. However, there seems to be no evidence supporting that hypothesis in the data.

The remainder of the paper is structured as follows. First, a short overview across the literature on economic sanctions is given. Next, the empirical methods and data sources are explained. In chapter 4 the empirical results are presented. In chapter 5 a conclusion and an outlook is offered.

2 Literature

During the last two decades several researchers tried their hands at explaining the consequences of economic sanctions on trade from various angles, both theoretical and empirical. Given below is a selection of research after 2000 that in no way claims completeness.

A detailed and instructive summary of economic sanctions, their goals, and their success or failure in the 20th century is given by Hufbauer et al. (2009). The authors conclude with the policy implication that smart sanctions that target specific sectors should be used in favor of total embargoes. Another, even more detailed database can be found in the Threat and Imposition of Sanctions database (TIES) by Morgan et al. (2014). It contains specific records of cases of economic sanctions, including both, threats and impositions from 1945 until 2005. Additionally, information about sender and target interests, as well as some measure for economic costs of these sanctions, are included as well.

Since the USA are the most prominent user of economic sanctions as means of foreign policy, many researchers have focused on said effects of US sanctions on trade value and the econometric instrument utilized most is the gravity equation. The large negative impact of unilateral US sanctions against 49 target countries on bilateral trade volume covering the time frame from 1960 until 2000 has been analyzed by Caruso (2003). Hufbauer and Oegg (2003) estimate the significant damage of sanctions on US trade in 1995 and 1999. They also compare the trade volume of the US and their target countries with trade between the other G-7 countries and target countries. While confirming the large negative effect of extensive sanctions, they find slight positive effects for limited and moderate sanctions. Yang et al. (2004) show that moderate and limited sanctions have no effect on US trade with target countries, while extensive sanctions significantly decrease bilateral trade. These sanctions lead in turn to increased trade of target countries with the EU and Japan.

More recently, several authors concentrate on the effects of sanctions on Russia after the annexation of the Crimea and the counter-sanctions employed by Russia. Dreger et al. (2015) focus on the depreciation of the Ruble and, using daily exchange rate data from January 2014 to March 2015, they find that the depreciation is mainly caused by the decrease of oil prices and not so much due to economic sanctions of the West. Crozet and Hinz (2016) concentrate on the costs of imposing and maintaining sanctions on Russia for the sender countries utilizing monthly country-level trade data from December

2013 to June 2015. Using French firm-level export data they show that after the implementation of sanctions both, the extensive and intensive margin of exports, have been strongly reduced. Afesorghor and Mahadevan (2016) link economic sanctions to a widening of income inequality within target states, depending on the type of sanction.

Another branch of literature concentrates on the difference of merely threatening and actually imposing sanctions. Afesorghor (2016) provides some evidence that the mere threat of sanctions actually boosts trade between target and sender, while imposed sanctions decrease trade. In contrast to this, a recent working paper by Kohl and Reesink (2016) find no evidence that the threat of sanctions has a significant effect on the value of trade.

Dizaji and van Bergeijk (2013) develop a theoretical model and test it empirically using the boycott of Iranian oil. Their key findings are that the success probability of sanctions is higher in the short run and decreases in the long run. Since success of economic sanctions also depends on the possibility for countries to circumvent them, there are some works regarding third country effects. Focusing on sanctions targeting Iranian exporters Haidar (2016) finds evidence for trade diversion. He concludes that sanctions are less effective in a globalized world as deflection becomes easier. Some more evidence for trade diversion is found by (Early, 2009) via a probit estimation for the years 1950 to 1990. Yang et al. (2009) compare the effects of trade between the US and countries that are targeted by US sanctions with trade between EU and these target countries and report mixed results for trade diversion.

In the paper at hand I critically re-evaluate the results of gravity-estimation strategies using a panel data set that is both bigger in the observed time-frame as well as in the country-sample size than other existing studies. I compare these findings with a well-specified gravity estimation in order to quantify the effect sanctions have on the value of trade. I also differentiate between the implementation of sanctions as a whole and three different levels of sanction intensities. Finally, I try to find evidence for the existence of trade diversion.

3 Empirical methods and data

Some of the empirical results mentioned above very likely suffer from severe endogeneity bias. This is mainly due to the omission of multilateral resistance terms. The study at hand shows that the obtained results differ greatly between a naive and a correctly specified gravity equation. In this section, the

empirical specifications are described in detail as well as the build-up of the data set.

The first specification of the gravity equation which is estimated using OLS is given below:

$$\ln(m_{ijt}) = \beta_1 \ln(Y_{it}) + \beta_2 \ln(Y_{jt}) + \beta_3 \ln(dist_{ij}) + \beta_4 sanc_{ijt} + \beta_4 rta_{ijt} + \gamma X_{ij} + \epsilon_{ijt}, \quad (1)$$

where the original multiplicative function has been transformed using logs. Here, m_{ijt} gives the value of imports of target i from sender j in year t . Y_{it} and Y_{jt} denote country i 's and country j 's GDP in year t , respectively. $dist_{ij}$ is the geographical distance between the two trading countries approximated by the distance between the biggest cities of both countries, weighted by the total share of the city in the overall country's population. The sanction-dummy $sanc_{ijt}$ takes the value of 1 if there is a sanction in effect in country i from country j at year t , and zero otherwise. In order to differentiate the effects of different severity types of sanctions I will also classify them by groups following Hufbauer and Oegg (2003) which will be described below in detail. Included also is a dummy that captures active regional trade agreements (RTAs), rta_{ijt} . X_{ij} incorporates the vector of usual time-invariant dummy variables for common language, contiguity, and colonial ties. Finally, the error term is denoted by ϵ_{ijt} . This approach, however, most likely suffers from omitted variable bias due to unobserved characteristics that affect trade flows other than the ones already included and due to unobserved multilateral resistance (Anderson & Van Wincoop, 2003). One way to address this issue is the usage of fixed effects (FEs).

Thus, time fixed effects are included within the second gravity equation given below:

$$\ln(m_{ijt}) = \beta_1 \ln(Y_{it}) + \beta_2 \ln(Y_{jt}) + \beta_3 \ln(dist_{ij}) + \beta_4 sanc_{ijt} + \beta_4 rta_{ijt} + \gamma X_{ij} + \alpha_t + \epsilon_{ijt} \quad (2)$$

Here, the time fixed effect α_t accounts for everything that happens within a given year t and simultaneously affects all trade partners. This approach, however, potentially still suffers from omitted variable bias due to time-invariant country-pair characteristics that affect trade flows other than the ones already included. It could be possible, for example, that country pairs that share strong historical ties potentially also have similar values and preferences that may affect the value of trade. In the next specification I therefore include country-pair fixed effects, α_{ij} :

$$\ln(m_{ijt}) = \beta_1 \ln(Y_{it}) + \beta_2 \ln(Y_{jt}) + \beta_3 sanc_{ijt} + \beta_4 rta_{ijt} + \gamma X_{ij} + \alpha_t + \alpha_{ij} + \epsilon_{ijt} \quad (3)$$

The country-pair fixed effects capture all time-invariant country-pair specific influences on trade, both, observable and unobservable. Therefore, it is no longer possible to quantify, e.g., the effect of a common language on the value of trade. Specifications (1) to (3) do not take into account shocks that independently affect the importer or the exporter in a given year, such as potential changes in legislature due to election outcomes which could either be a boost or a hindrance to trade. To account for this possibility, equation (4) includes importer-year and exporter-year fixed effects, α_{it} and α_{jt} respectively, instead of an overall time fixed effect α_t .

$$\ln(m_{ijt}) = \beta_1 sanc_{ijt} + \beta_2 rta_{ijt} + \alpha_{it} + \alpha_{jt} + \alpha_{ij} + \epsilon_{ijt} \quad (4)$$

The fixed effects now capture, additionally to GDP and population, factor endowments, openness, and other time specific shocks, some of which are quite hard to observe. The only explanatory variables that are not controlled for by the fixed effects are the dummies for sanctions and RTAs.

The information on sanctions stems from TIES and is available until the year 2005 (Morgan et al., 2014). The authors differentiate between 10 types of sanctions, which I have grouped into three categories, following Hufbauer and Oegg (2003), namely extensive, moderate, and limited sanctions, respectively. Extensive sanctions contain only total economic embargoes and blockades, e.g., those against North Korea and Cuba. Sanctions regarding partial economic embargoes, specific import and export restrictions, and suspension of trade agreements are combined within moderate sanctions. Finally, limited sanctions refer to travel bans, termination of foreign aid, and asset freezes. If a country has multiple sanction types in place, I only count the most severe. Sanctions that were merely threatened but never actually imposed are not included within the sample[†]; neither is information whether sanctions ended because the goal of the sending countries was reached, or whether they were abolished because of other political reasons. Information on bilateral trade on the country level is provided by Feenstra and Romalis (2014) covering the years 1984 to 2014.[‡] The gravity controls for distance, GDP, common language, and trade agreements stem from CEPII (Head et al. (2010), Head and Mayer (2013)). In conclusion, the data set at hand covers the years from 1984 to 2005 and I end up with a sample size of over 360,000 observations and 28,000 (non-singleton) country pairs.

[†]see Kohl and Reesink (2016)

[‡]There is an older data set by Feenstra et al. (2005) that offers data from 1962 to 2000 but the overlapping years do not match.

Table 1: Summary Statistics

	Min	Max	Mean	Std. Dev.
Total trade (in mn USD)	0.00	302,195.4	256.16	2806.27
GDP (in bn USD)	0.02	12,416.5	275.36	969.4
Distance (in km)	60.77	19,781.39	7,515.55	4,520.1

Total number of RTAs	2,643
Total number of sanctions	1,060
Total number of extensive sanctions	102
Total number of moderate sanctions	909
Total number of limited sanctions	55

Some descriptive information regarding the variables can be found in table 1. Aggregate trade value varies from zero to over 300 billion USD, GDP ranges from 20 million to over 12 trillion USD. The closest country pair in the sample is Hongkong and Macau with a geographical distance of 60 kilometers, while the largest distance covered is from Taiwan to Paraguay. Within the sample there are a total of 2,643 trade agreements and over 1,000 country pairs which are affected by sanctions at least once across the covered time span. If sanctions are grouped due to their severity, there is a total of 102 severe, 909 moderate, and 55 limited sanctions. Please note that some sanction-sending countries changed their sanction intensities within a given year, this is why the numbers do not add up.

4 Results

This section presents the results of the empirical estimation. The first subsection consists of results seeking to quantify the trade destruction effect that sanctions possibly have on the previously introduced model specifications. The second part estimates the effects of potential trade diversion in the face of these sanctions, also estimating different models.

4.1 Trade destruction

In table 2 the results of the four gravity specifications are given. Column 1 gives the results for estimation specification of the naive gravity (1) using OLS. Apart from specification 1, the following specifications all include year fixed effects. Standard errors are robust and clustered at the country-pair level. To offer the greatest amount of comparability, the same sample is used across all specifications. In specification (1) all of the explanatory variables appear highly significant. An increase of either, target or sender GDP, would be equally reflected by an increase in the trade value, an increase in distance of 1 percent would decrease the value of trade by 1 percent. RTAs, common language, colonial background, and contiguity all boost the value of trade significantly. All of these findings are to be expected. The implementation of sanctions, however, seems to have a highly significant positive impact on the value of trade, which comes as a surprise.

In the second specification, year-fixed effects are included. The results stay fairly robust compared with specification 1. The sanction dummy still appears to have a highly significant positive influence on international trade. This result is again very counter-intuitive.

In model 3, based on equation (3), dyad fixed effects are included together with the time fixed effects. This means that now all time-invariant country-pair specific explanatory variables are accounted for, including distance and language. It can be seen that the influence of GDP is still large and highly significant, but the size of the effect has decreased dramatically. This is in line with previous studies. Also, the positive effects of regional trade agreements have decreased and are now around a more reasonable 24 percent increase in trade value that is in line with a meta-study of structural gravity estimations provided by Head and Mayer (2013). Under this specification, sanctions seem to have a highly significant influence on the value of trade. If one country imposes sanctions on another country, the value of trade decreases by about 10 percent.

In model 4, additionally to the dyad fixed effects, sender-year and target-year fixed effects are included at the cost of GDP measures. Equation (4) further improves the accuracy of the estimates, also

supported by the steady increase of the adjusted R^2 . The results are quite similar to those obtained by model specification 3. Sanctions decrease the value of trade by around 10 percent, while trade agreements increase trade value by about 23 percent.

Table 3 presents the findings for different levels of sanction intensities, limited, moderate, and extensive sanctions. The model specifications are similar to those in table 1 to allow for comparability. Again, OLS-specification (1) and FE-specification (1) seem to suffer from omitted variable bias, rendering the use of moderate sanctions highly significant and positive for the value of international trade. Controlling for country-pair fixed effects changes these findings towards more plausible results. Whereas limited sanctions appear to have no significant effect on trade whatsoever, carrying out moderate sanctions decrease trade value by around 10 percent and applying extensive sanctions destroys trade all together. Adding sender-year and target-year fixed effects renders limited and extensive sanctions insignificant, while moderate sanctions remain stable in significance and similar in size. One potential reason for this may be that the number of extensive sanctions is low and mostly remain steady over the whole sample period which means there are not many changes to observe. A big problem with estimating sanctions is the endogeneity of their implementation. It is not a far stretch to believe that countries are potentially reluctant to implement extensive sanctions against important trading partners but less so in implementing limited or moderate ones.

Concluding from the evidence presented here, it seems that moderate sanctions are the main driver of the negative impact on the value of trade compared to overall sanctions, decreasing trade value by about 6 to 10 percent.

4.2 Trade diversion

In the definition of trade diversion I follow Magee (2008). Trade diversion is captured by the dummy variable TD_{ijt} . $TD_{ijt} = 1$ if either of the two countries is affected by an active sanction in year t , either as sender or as target. The dummy is zero if i is the sender and j is the target of a sanction at time t and it is zero if neither country is directly affected by a sanction. This means that trade diversion is defined in such a way that it only takes a positive value if active sanctions influence one of both trade partners. Hence, the variable is not bilateral but unilateral. If trade diversion takes place I expect to find a positive coefficient that can offset the negative effect of a sanction. This would translate into a switch in trade away from a sanctioning partner towards a non-sanctioning one.

In order to check for trade diversion it is no longer possible to make use of the well-specified fixed effect gravity specification (3) because it controls for all country-year-specific effects. Results for the

OLS-approach are omitted in table 4, only the results for the remaining fixed effect specifications (1) and (2) are shown. Columns 1 and 3 report the findings for the trade sanctions dummy, in columns 2 and 4 the sanctions are split into the three levels. Fixed effect estimation specification (1) is used in column 1 and 2, fixed effect specification (2) is observed in columns 3 and 4. FE 1 again overvalues GDPs and the effect of trade agreements on the value of trade. It also returns an implausible positive and significant effect of sanctions on trade values. The standard gravity controls deliver the expected results from previous estimations. In model FE 2, the dummies for extensive and limited sanctions, as well as the dummy for sanctions as a whole, returns negative and significant results. The trade diversion dummy stays insignificant across all observations, thus pointing towards the interpretation that no trade diversion takes place across the sample. There is one potential explanation for this. It is implausible to assume that a sanctioned country is able to completely substitute its decrease in trade value from a former partner with one or two different partners that do not impose sanctions. It makes more sense to assume that it renegotiates with multiple new partners, each adding only a fraction of the loss. Unfortunately, these small changes will most likely not be captured by the estimation because they are lost in the process of aggregation.

Table 2

Dep. var.: Log(Import value)	OLS	FE 1	FE 2	FE 3
Sanction	0.222*** (0.051)	0.324*** (0.051)	-0.145*** (0.026)	-0.096*** (0.026)
RTA	0.892*** (0.047)	1.019*** (0.047)	0.282*** (0.020)	0.260*** (0.029)
Ln(GDP _s)	1.098*** (0.005)	1.105*** (0.005)	0.424*** (0.010)	
Ln(GDP _t)	0.880*** (0.005)	0.888*** (0.005)	0.557*** (0.010)	
Common Language	0.916*** (0.034)	0.906*** (0.034)		
Contiguity	0.755*** (0.081)	0.724*** (0.082)		
Colonial Background	1.162*** (0.074)	1.096*** (0.075)		
Ln(distance)	-1.123*** (0.016)	-1.121*** (0.016)		
Observations	361089	361089	361089	361089
Adjusted R^2	0.636	0.643	0.860	0.873
Year fixed effect	No	Yes	Yes	No
Dyad fixed effect	No	No	Yes	Yes
Sender-year & target-year fixed effect	No	No	No	Yes

Cluster robust standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 3

Dep. var.: Log(Import value)	OLS	FE 1	FE 2	FE 3
Extensive	-1.15** (0.476)	-1.291*** (0.480)	-1.073*** (0.353)	-0.105 (0.246)
Moderate	0.266*** (0.051)	0.368*** (0.051)	-0.134*** (0.024)	-0.100*** (0.026)
Limited	0.143 (0.282)	0.389 (0.248)	0.133 (0.081)	-0.029 (0.096)
RTA	0.890*** (0.047)	1.017*** (0.047)	0.282*** (0.025)	0.260*** (0.029)
Ln(GDP _s)	1.098*** (0.005)	1.104*** (0.005)	0.425*** (0.021)	
Ln(GDP _t)	0.880*** (0.005)	0.888*** (0.005)	0.559*** (0.019)	
Common Language	0.917*** (0.034)	0.907*** (0.034)		
Contiguity	0.760*** (0.081)	0.729*** (0.082)		
Colonial Background	1.161*** (0.074)	1.095*** (0.075)		
Ln(distance)	-1.123*** (0.016)	-1.122*** (0.016)		
Observations	361089	361089	361089	361089
Adjusted R^2	0.636	0.645	0.860	0.866
Year fixed effects	No	Yes	Yes	No
Dyad fixed effects	No	No	Yes	Yes
Sender-year & target-year fixed effect	No	No	No	Yes

Cluster robust standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4

Dep. var.: Log(Import value)	FE 1	FE 1	FE 2	FE 2
Sanction	0.336*** (0.056)		-0.153*** (0.029)	
Extensive		-1.282*** (0.480)		-1.078*** (0.353)
Moderate		0.381*** (0.056)		-0.142*** (0.027)
Limited		0.399 (0.249)		0.126 (0.082)
Trade Diversion	0.013 (0.021)	0.014 (0.021)	-0.008 (0.013)	-0.008 (0.013)
RTA	1.018*** (0.056)	1.016*** (0.047)	0.283*** (0.025)	0.282*** (0.025)
Ln(GDP _s)	1.102*** (0.005)	1.102*** (0.005)	0.425*** (0.021)	0.425*** (0.021)
Ln(GDP _t)	0.886*** (0.005)	0.886*** (0.005)	0.558*** (0.019)	0.559*** (0.019)
Common Language	0.909*** (0.034)	0.910*** (0.034)		
Contiguity	0.729*** (0.082)	0.734*** (0.082)		
Colonial Background	1.097*** (0.075)	1.095*** (0.075)		
Ln(distance)	-1.119*** (0.016)	-1.119*** (0.016)		
Observations	361089	361089	361089	361089
Adjusted R^2	0.642	0.643	0.860	0.860
Year fixed effects	Yes	Yes	Yes	Yes
Dyad fixed effects	No	No	Yes	Yes

Cluster robust standard errors in parentheses, * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

5 Concluding Remarks

The goal of the paper was to quantify the effect of trade sanctions on the value of trade using the gravity equation and to test its robustness against several mis-specified gravity equations commonly used in the literature. It also shed some light on the question if trade sanctions are potentially offset by the occurrence of trade diversion. For this, information containing bilateral trade values has been merged with gravity controls and data regarding the imposition- and end-year of economic sanctions between country pairs.

The evidence presented in the previous section shows that, indeed, trade sanctions have a significant negative impact on the value of trade. If sanctions are split into three categories, it can be seen that this negative impact is mostly due to moderate sanctions, specifically targeting single sectors. This makes sense as the bulk of all sanctions is incorporated within this specification. Limited sanctions seem to have no measurable influence and extensive sanctions only in some of the specifications. Since moderate sanctions mostly measure financial or personal restrictions, it makes sense to not find evidence within the data. Extensive sanctions lose their significance after being correctly specified. This counter-intuitive finding can potentially be explained that there is little to no variation in extensive sanctions within the sample and points towards some amount of endogeneity when it comes to the implementation of sanctions.

Trade diversion on the other hand does not play a role in these specifications. Following the results, it is not possible to blame the ineffectiveness of sanctions on a diversion from one trading partner to another one. It is, however, possible that trade diversion does exist but is masked by the level of aggregation within the data set.

For future research it would be interesting to include year-sanction interactions to see if different types of sanctions behave differently over time. To find more comprehensive results for trade diversion it may be necessary to use information about trade value on a more dis-aggregated level. Unfortunately, neither Hufbauer et al. (2009) nor TIES(2005) offer this kind of information.

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