The Impact of Economic Sanctions on International Trade: How do Threatened Sanctions Compare with Imposed Sanctions?

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Abstract

In this paper, we draw on established theoretical works in international political economy to compare the empirical impact of the threat of economic sanctions to the actual imposition of economic sanctions on international trade. Deepening the analysis, we analyze whether there are any differential effects when different instruments are employed. We also examine the international trade effect of sanctions at a more disaggregated products level. Thus, we are able to test whether sanctions have any adverse effect on essential commodities such as food and medical supplies in contravention of the Geneva Convention which stipulates the passage of such essential goods even in times of sanction. To achieve this, we use the gravity model as our empirical tool and recent detailed disaggregated data on sanctions spanning a long time series from 1960 to 2009. Our results show the impact of threatened sanctions differs qualitatively and quantitatively from imposed sanctions. Whereas imposed sanctions lead to a decrease in the trade flow between the sender and the target, a threat of sanctions leads to an increase in the trade flow. The positive impact of the threat may be due to economic agents in both the sender and its target resorting to stockpiling prior to the actual imposition of sanctions to minimize any adverse consequences of the sanctions. In addition, we find varying effects for the different sanction instruments. Also, the detrimental effect of sanctions extends to essential products.

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1   Introduction

A historical review of sanctions indicates that there have been quite a number of threats of sanction which were not carried out ultimately. More currently, the international diplomatic landscape has been inundated with rising political tensions between states accompanied with both threats and impositions of sanctions. As current as January 2016, China issued a threat to impose sanctions on US defence companies that sell arms to Taiwan[1]. However, there exist no empirical studies that focus on the implications of threats of economic sanctions on international trade. Previous research has focused exclusively on the trade effect of imposed sanctions (Caruso, 2003; Hufbauer, Schott, Elliott, & Oegg, 2007). A few number of studies argues that the threatening stage is critically relevant in understanding the outcome of sanctions and the threat of economic sanctions may even be more important than the actual imposition (Eaton & Engers, 1992; Lacy & Niou, 2004). There are also studies that attribute the general conclusion of sanctions being ineffective to the exclusion of the threat stage in the sender-target interactions (Whang, McLean, & Kuberski, 2013).

The target's behavior at the threat stage or before the actual imposition may affect the outcome of sanctions. There may be different courses of action available to the target at the threat stage. A target may decide to comply with just a mere threat by the sender in order to avoid any negative consequences of the actual imposition. Conversely, the target can defy the threat by adopting strategies *ex ante* that could minimize the eventual imposition of the sanctions. Any possible adjustment to minimize the sanction damage will not be limited to the target alone, as there are also economic agents within the sender state that will be adversely affected when the threat is actually implemented. Thus, anticipation of international sanctions can trigger perverse actions by economic agents within the sender and the target states that may have negative or positive consequences for international trade (van Bergeijk, 2009). Adopting adjustment measures prior to the actual imposition may not be improbable in practice because, even in cases when sanctions have been imposed, targets adopt strategies such as transshipment to circumvent the sanctions.

Analyses of the effect of trade agreements have changed significantly as a result of considering the anticipation effects. For example, McLaren (1997) shows that the anticipation effect of negotiating trade agreements can substantially increase the estimated impact of signing a free trade agreement. Conversely, Baier and Bergstrand (2007) highlight the fact that firms may delay trade temporarily in anticipation of an impending trade agreement. In addition, there is a literature pertaining to safeguards and anti-dumping measures that has pointed to anticipation effects – for example, stockpiling, or immediate diversification away from a source of supply that may become subject to a trade measure (see for example, Hoekman and Leidy (1989)). It was van Bergeijk (2009) who linked the possibility of stockpiling to threat of sanctions. He points to the fact that threat can act as an incentive for potential targets to stockpile against future negative effects of sanctions. Thus, the net impact of a threat of sanctions depends on the behavior or attitude of the targets towards risk and their expectation formation process (van Bergeijk, 1995).

Thus, the basic question in this paper is whether there is any empirical evidence of anticipation effects of stockpiling when it comes to sanctions. If agents anticipate sanctions based on signals or threats given by the relevant entities, do they adjust *ex ante*? Do firms adjust production and trade or do consumers adjust consumption *ex ante* in order to minimize any *ex post* damage when the sanctions are eventually

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[1]Reported by Reuters on January 26th, 2016. http://http://blogs.reuters.com/great-debate/2016/01/26/china-threatens-sanctions-against-u-s-companies-is-this-the-future/

imposed? Does the data provide such empirical evidence, and how based on theory can we explain the reaction of firms and consumers? Is it the case that the effectiveness of sanctions is reduced if traders can anticipate and adjust sourcing accordingly? Does the impact of threatened sanctions differ qualitatively or quantitatively from actual imposed sanctions? These questions have become more relevant today as we witness the re-emergence of a 'sanction decade'.

Theoretically, it has been argued that the anticipation or a threat of sanctions produces trade-deteriorating effect comparable to imposed sanctions (see for example, Fuchs and Klann (2013); Morrow, Siverson, and Tabares (1998)). Their main argument is that the threat of sanctions produces political, legal and credit risks for businesses engaged in international trade. Exposure to these risks will reduce expected profitability for businesses and ultimately reduce the trade flow between the sender and its target. However, anticipation of sanctions could also trigger stockpiling by producers and consumers, especially in the short-run. For international firms, the main reason could be the associated large sunk costs that are incurred in changing export destinations or sources of imports. Similarly for consumers, tastes and preferences are known to change slowly and hence there is reluctance to alter consumption bundles because of impending sanctions.

From these theoretical point of views, the tendency of threatened sanctions to trigger stockpiling may either change the net effect of threatened sanctions qualitatively or minimize any negative effects quantitatively. In fact, van Bergeijk and van Marrewijk (1995) point out that the passage of time between the threat and the imposition acts as an important incentive for the target to build stockpiles and adjust its economic structure in advance. Thus, it is plausible that the anticipation of sanctions may not produce similar effect as actual imposed sanctions because economic actors can act differently under imposed sanctions compared to threatened sanctions.

In this paper, we empirically compare the trade effects of threatened and imposed sanctions by relying on a recent and detailed compilation of the Threat and Imposition of Economic Sanctions(TIES) database by Morgan, Bapat, and Kobayashi (2014). Previous studies that focused on the trade effects of sanctions such as Caruso (2003) and Hufbauer et al. (2007) restrict their analyses to the US as the only sender of sanctions while Morgan et al. (2014) have shown through their TIES database that there are other frequent senders of sanctions apart from the US. Interestingly, the data shows that developing as well as developed countries resort to the use of sanctions as a foreign policy tool. Although, the US is most frequent sender, there are other countries such as Canada, Russia, the UK and India that are also frequent senders of sanctions. Furthermore, the TIES data distinguishes between sanction cases in which they were mere threats as compared to actual impositions. In addition, it provides detailed information on different sanction instruments of employed by the senders.

Generally, the focus of previous economics literature has been on the effectiveness of sanctions in altering the behavior of the target state so it complies with the intentions of the sender state. This strand of literature includes studies by Pape (1997),van Bergeijk (1989), Bapat and Clifton Morgan (2009), etc. The majority of these studies tend to conclude that sanctions are ineffective in persuading the target to change its objectionable policies. However, whether sanctions are effective or not, they can still adversely affect the dyadic relationships between the sender and its target. This could result in reduced dyadic international flows such as trade flows, foreign direct investment, migration and foreign aid between the sender and its target.

Apart from the dyadic effects, current studies have shown that sanctions have adverse consequences for target states. They show that the imposition of sanctions has adverse distributional effects and it is more severe for the poor and the civilian

population (Afesorgbor & Mahadevan, 2016); it triggers currency crises (Peksen & Son, 2015); it retards the targets' economic growth and development (Neuenkirch & Neumeier, 2015) and it widens the poverty gap (Neuenkirch & Neumeier, 2016). These adverse and unintended consequences of sanctions have shifted the attention of the international community and researchers to how to minimize the impact of sanctions on the poor or target the sanctions at specific groups (so-called smart sanctions).

To reduce the sanction damage for the poor would require knowledge in two specific dimensions: first, the impact of specific instruments employed by the sender; second, the international trade effect of sanctions as to which specific products are affected, for instance, whether sanctions affect essential commodities such as food and medical supplies or luxury goods for the rich. In an attempt to tailor sanctions only the political leaders of North Korea, the United Nations for instance specifically banned the sale of luxury goods to North Korea as Kim Jong-II is believed to be a fan of products such as Hennesey cognac, iPods, Harley Davidson motorcycle, and plasma televisions (Hufbauer et al., 2007).

Another strand of literature has shown that political interactions between states whether good or bad, can have major consequences for bilateral trade between them. Rose (2007) shows that strong political ties established through state visits significantly increase the trade flow between states. Similarly, Nitsch (2007) confirms this positive effect of state and official visits on bilateral exports. Conversely, strained political relations also disrupt trade flows (Fuchs & Klann, 2013). This therefore makes bilateral trade flows highly sensitive to state-to-state political interactions. Anderson and Marcouiller (2002) explain that international trade is volatile because it consists of cross-border transactions that are exposed to various risks. Consequently, any act of uncertainty or imperfect contract enforcement may produce dramatic negative consequences for trade between any two countries. Such uncertainty can emanate from threats of economic sanctions which can make commercial enforcement of international agreements difficult as much as actual (imposed) sanctions. For instance, Morrow et al. (1998) highlight the exposure of international firms to political risk of their assets or products being confiscated, to credit risk exposing exporters or importers non-payment because of limitations imposed on financial transfers.

The focus of our study thus fills an apparent gap in three ways. First, we will be the first to empirically address how the threat of sanctions affects international trade using a more detailed cross-country analysis. This provides a unique opportunity to explore theories within international political economy as to how sensitive trade is to a mere threat of sanctions compared to the actual imposition of sanctions. Secondly, a focus on different sanctions instruments at a more disaggregated level provides a new perspective in the sanctions literature, and offers knowledge of the effect of each instrument and how to apply them efficiently. This is relevant given the increasing debate about sanctions being regarded as a double-edged sword that cannot distinguish innocent civilians from political leaders. Thus, identifying how these different instruments affect international trade will improve the ability of different actors to apply them. Lastly, a product-level analysis also provides new insights as to how the imposition of sanctions restricts the flow of different product categories. This is relevant as the Geneva Convention has specific provision for the unrestricted passage of products essential for human survival even in sanctioned states. Understanding which product categories are affected will provide information about the consequences of sanctions on different segments of the population, especially the civilian population.

In summary, our results show the impact of threatened sanctions differs qualitatively and quantitatively from that of imposed sanctions. Whereas imposed sanctions lead to a decrease in the trade flow between the sender and the target, threatened

sanctions lead to an increase in the trade flow. The positive impact of the threat may be due to economic agents in both the sender and its target resorting to stockpiling prior to the actual imposition of sanctions to minimize any adverse consequences of the sanctions. In addition, we find varying effects for different sanctions instruments and detrimental effect of sanctions extended to essential products.

The rest of the paper proceeds as follows: Section 2 provides possible theoretical arguments on how threatened and imposed sanctions affect bilateral trade between the sender and its target, and on the basis of this formulates hypotheses. Section 3 presents the empirical strategy, econometric methods and data. Section 4 provides the empirical results with discussions and Section 5 concludes the study.

2   Theoretical argument and hypotheses

International political economy emphasizes the importance of political/diplomatic relations in the determination of trade flows among states (see for example, Fuchs and Klann (2013); Heilmann (2016); Morrow et al. (1998); Nitsch (2007); Rose (2007)). However, if this political relationship becomes strained, it can negatively affect the trade flow. Morrow et al. (1998) argue that increasing political or diplomatic tensions among states increases the risk of trade disruption between states, in that, the more likely the political tensions, the more profitable trade must be to compensate for the risk of disruption. In addition, they argue that this risk premium also increases even with the anticipation of political tensions between states. A recent study by Fuchs and Klann (2013) confirms the trade-deteriorating effect of diplomatic tensions, even without explicit conflict or economic sanctions between the states. Empirically, they show that countries that received the Dalai Lama suffered a slump in bilateral trade with China although the Chinese government did not explicitly impose any trade sanctions, but only threatened to impose sanctions on any country that received the Dalai Lama. Brooks (2002) argues strongly that the threat of sanctions is sufficient to exert negative consequences on the target even when the sender only issues a threat which may or may not be imposed.

The effect of anticipation of sanctions on trade may be influenced by the reaction of firms and consumers to any signal of threat. To a large extent, firms that engage in international trade do not only make strategic decisions on the basis of intrinsic value as measured by price, quantity and quality of goods and services but also importantly, on the basis of the political risks associated with trade and its finance (Fuchs & Klann, 2013). These political risks are important determining factors for firms as international trade is not a *cash and carry* transaction but involves longer processes and takes time as products move across borders. One example of how political risks emanating from strained political relations could hinder international trade would be the inability of trading partners to pay for goods shipped to them because of a ban on financial transfers as a result of economic sanctions. Sanctions may create a fundamental problem of exchange, especially when goods are in a transit without adequate assurance that the letter of credit will be honored when the delivery conditions are met. Thus, a risk-averse exporter will be hesitant to ship products to an importer when there are possible threats or an anticipation that sanctions will be imposed on the importer country.

Conversely, the anticipation of sanctions could also trigger stockpiling especially in the short-run when changing suppliers of raw material, intermediate or final products may be more costly. This is important when sunk costs are estimated to be substantial and hence play a pivotal role in the exporting or importing decisions of firms (Bernard & Jensen, 2004; Roberts & Tybout, 1997). The literature on the

trade cost of a threat or anticipation of sanctions only pinpoints to the negative effects. The majority of studies conclude that the anticipation of sanctions can produce negative consequences for trade (see for example, Anderson and Marcouiller (2002); Morrow et al. (1998)). However, the sunk costs of exporting and importing are major determinants of whether a firm will enter foreign market. The sunk costs may include market information and search costs, the fixed costs of adjusting products to a country's standards or preferences. Overall, these sunk costs may deter a firm from immediately deciding to change its suppliers because of impending restrictions on trade or finance. Rational expectation theory predicts that prior expectation of risks minimizes the loss agents are likely to suffer because of the possibility of prior commitments. In the short term, firms may resort to stockpiling as one of the prior commitment mechanisms in the face of possible threats from senders. By and large, the anticipation of sanctions may make exporting/importing firms react *ex ante* by building stockpiles, especially when immediate changes to suppliers would be more expensive.

Similarly, basic consumer theory also indicates tastes and preferences as key determinants of demand. Thus, consumers are reluctant to change their preferences in the short-run, and hence, they are more likely to resort to stockpiling of consumer goods in order to maintain the same level of satisfaction. Thus, the significant sunk costs for firms and sticky tastes and preferences of consumers could lead to a positive effect of a threat of sanctions on bilateral trade. There is evidence of stockpiling by some targeted states as a way of minimizing the negative consequences of sanctions in the future. Thus, it is theoretically plausible that a threat of sanctions could result in increased trade between a sender and its target before sanctions are imposed. Davis and Meunier (2011) allude to such evidence in two cases: when there were rising political tensions between the US and France (over the invasion of Iraq) and China and Japan (over territorial and historical disputes). They indicate that even in the face of intense political hostilities, trade and investment flows between these countries were still high, and this was mainly attributed to sunk costs that governments, firms and consumers would have incurred if they had changed their behavior.

This therefore leads to our first hypothesis which compares the impact of threatened and imposed sanctions on international trade to determine whether the effects are qualitatively and quantitatively different.

Hypothesis 1: The threat of sanctions produces trade-deteriorating effects comparable to actual sanctions.

If a threat of sanctions is to have any significant effect or change the behavior of international firms, then the threat must be credible enough to produce changes in the behavior of exporters and importers. Credibility of the threat would depend to a large extent on the entity from which the threat is emanating as well as the ability to enforce the sanctions, i.e., credibility would depend on the authority of the entity to command and enforce the sanctions. For example, Fuchs and Klann (2013) indicate that trade-deteriorating effects with China for receiving the Dalai Lama is influenced by the rank of the political leader that met the Dalai Lama. A threat of sanctions may be issued by different entities such as the executive or government, legislature, state organizations, etc. The ranks of government functionaries carry different degree of authority and hence different credibility.

Since we are considering the effect on international trade, the proximity of the threat-issuing entity to exporters or importers should also matter. Various exporter

and importer associations regularly hold meetings where foreign service and trade-related agencies are invited. Generally, threats emanating from such institutions as Ministries of Trade and Industry, Ministries of Finance and Commerce, Ministries of Foreign Affairs and Customs Agencies should be taken seriously by exporters or importers as they are mostly the implementing and enforcing agencies. This indicates that threats from institutions in closer contact with traders may be more credible and will lead to stronger prior adjustments to minimize the cost of sanctions when they are imposed. Thus, our second hypothesis is as follows:

Hypothesis 2: The effect of the threat of sanctions on trade will depend on the ranks of the officials issuing the threat.

Different senders employ different sanctions instruments. Hufbauer et al. (2007) explain that different types of sanctions have different effects in several ways. They argue that trade sanctions may have a limited impact compared to financial sanctions since the disruption of financial flows may also disrupt international trade even without any explicit trade sanctions. In addition, trade controls may be applied to selective products because the Geneva Convention prohibits the banning of essential goods such as food and medicine. Unlike financial sanctions, trade sanctions may be difficult to enforce and thus it is possible for target states to easily circumvent the ban.

The different effects of various instruments may not necessarily be limited to the broad categories of financial and trade instruments. Within trade sanctions, there could be import bans or export embargoes and these can affect the trade flows between the sender and the target differently. Similarly, there are various financial sanction instruments such as cutting of financial aid, capital flows, bank lending and access to SWIFT. These different instruments can produce differential effects on international trade. In addition, there is also growing concern about the use of smart sanctions. This involves the use of asset freezes and travel bans, mostly targeted at political and economic elites in target states. Hufbauer et al. (2007) argue that these so-called smart sanctions can easily be circumvented as they require detailed private information about individuals. Thus, our second hypothesis tests the effect of different instruments at a more disaggregated level.

Hypothesis 3: The trade effect of sanctions depends on the different instruments employed.

Knowledge of the trade effects of sanctions at the disaggregated product level is relevant especially as previous studies find that sanctions against Cuba and Iraq contributed to falls in nutritional value, increases in infectious diseases and increased infant and under-five mortality (Ali & Shah, 2000; Garfield & Santana, 1997). This indirectly indicates that the imposition of sanctions on these target states affected supplies of essential goods (food and medicines). More specifically, Gibbons and Garfield (1999) find that sanctions on Haiti led to an acute shortage of essential goods and this resulted in astronomical increases in the prices of medicines, vaccines, and baby formula. Trade embargoes on essential goods for human survival associated with sanctions can have adverse re-distributive and welfare effects. Constraints on essential goods are *de jure* not expected on the basis of the Geneva Convention. According to this convention, any trade-restricting effect of sanctions should not affect

the passage of essential goods such as food and medicines. Thus, our third hypothesis tests whether the imposition of sanctions affects essential products.

Hypothesis 4: The trade-deteriorating effect of sanctions does not affect essential goods.

3 Data and Empirical Strategy

3.1 Data

To test whether threats of sanctions made by governments or their functionaries have any trade-reducing effects comparable to actual sanctions, we use the TIES data by Morgan et al. (2014) to generate a dyadic sender-target and year-specific observations. Because of the dyadic nature of the analysis, we only focus on sanction episodes involving a primary sender state and its main target state. Hence, we do not cover multilateral sanctions threatened or imposed by multilateral organizations such as the European Union (EU) or the United Nations (UN). Tables A and B in Appendices 1 and 2 show the list of sender and target states. For developed sender states, apart from the US, which is a dominant sender, there are other developed countries such as Canada, Germany and the United Kingdom that jointly account for about 20% of total episodes of sanctions. In addition, there are also emerging and developing countries such as China, India, Saudi Arabia and Mexico that individually account for over 2% of total sanction cases. Among the target states, the US is also the most frequent target of sanctions.

TIES defines sanctions as actions that a sender takes to limit or end economic relations with a target in an effort to persuade the target state to change its objectionable policies. Our empirical sample examines cases of sanction which involve two countries, a primary sender and its target. In total, the sanctions considered in the analysis include 1153 cases involving 60 senders and 143 targets spanning the period 1960 to 2009. The matrix for the sanction cases comprises of 379 cases (33%) in which sanctions were threatened without any explicit imposition, 279 cases (24%) in which sanctions were imposed without threats and 495 cases (43%) in which sanctions were threatened and imposed at the same time.

Actual sanctions involve the use of several instruments such as the imposition of tariffs, export controls, import restrictions, travel bans, the freezing of assets and financial transfer bans, while threats involve the same instruments but ultimately they are not employed. This data source provides comprehensive information on the specific instruments used by a particular sender on a targeted state. The TIES data constitutes an improvement over previously used data sets, such as the Hufbauer et al. (2007) database, as it provides in-depth information on more countries and has a longer time series. This data comprises developed and developing nations as both sender and target states, thus providing an opportunity to derive the effects of sanction on trade in a broad and general setting which is not driven by a specific country or group. This is relevant because previous papers focus predominantly on US sanctions.

In measuring international trade, we extend the analysis from trade at aggregated level to different product categories. We differentiate between the sanction effects using exports and imports. We use aggregated trade flows from the IMF direction of trade statistics (DOTs). Data on the disaggregated trade flows is obtained from the

UN Comtrade database, which uses the Standard International Trade Classification (SITC). This disaggregation allows us to examine whether sanctions adversely affect trade of essential goods. This provides information on trade flows both at disaggregated level from 1962 to 2014 and hence, suitable to identify the product categories most affected by sanctions. The data from all these different sources are merged into a comprehensive panel data set.

Apart from the sanction variables, we also include the standard set of controlling variables in the gravity model, all sourced from CEPII. These include indicator variables that take one or zero otherwise if the sender and the target share membership in a regional trade agreement (RTA) or WTO/GATT, have a colonial tie, share a common border or a common currency. We use the dichotomous Democracy and Dictatorship (DD) database developed by Cheibub, Gandhi, and Vreeland (2010) to control for political regime types. Yu (2010) indicates that the political regimes of trading partners greatly affect the trade flow between them. The DD employs a minimalist approach and classifies political regimes either as democratic or autocratic (dictatorships). Descriptive statistics on the main variables are provided in Appendix 3.

3.2 Empirical Strategy

In terms of the empirical strategy, we employ the gravity model, which is a conventional framework for analyzing the determinants of trade flow. This empirical model assumes that the trade flow between two countries is determined by supply potential (exporter GDP), market demand potential (importer GDP) and trade cost (transport). Using regression analysis, the gravity model is augmented with the baseline variables of interest (imposed and threatened sanctions) as additional determinants of trade flow between the sender and the target. Sanctions are coded as indicator variables distinguishing between cases when they are threatened or imposed. Thus, we have our baseline econometric model as follows, in line with Anderson and van Wincoop (2003):

$$
\begin{aligned}
\ln X_{ij} = & \ \alpha_o + \alpha_{ij} + \alpha_t + \beta_1 M_{it} + \beta_2 M_{jt} + \beta_3 D_{ijt} + \gamma_{i(j)t} threats \\
& + \delta_{ij} impositions + (1 - \sigma)(MRT_{ijt}) + \epsilon_{ijt}
\end{aligned} \tag{1}
$$

α_{ij} and α_t are dyadic country fixed and time effects. We include country fixed effects to control for unobserved time-invariant variables and time effects to control for any global trends. $M_{i(j)t}$ are monadic variables for the exporter (importer) such as GDP, population, geographical area and political regime. D_{ijt} are dyadic variables such as distance, common language, common currency, colonial tie, border, RTA and WTO. MRT is the multilateral resistance term. We control for the MRT by using the Baier and Bergstrand (2009) proxy. These authors derive MRT from a first-order log-linear Taylor expansion which yields an empirical reduced form equation as follows:

$$
MRT_{ijt} = \frac{1}{N} [\sum_i^N \theta_{it} ln(T_{ijt}) + \sum_j^N \theta_{jt} ln(T_{ijt}) - \sum_{k=1}^N \sum_{m=1}^N \theta_{kt} \theta_{mt} ln(T_{kmt})] \tag{2}
$$

This measure is the simple average of multilateral relative to world trade costs (T_{ijt}), where T_{ijt} is replaced with observable trade costs such as distance, common language, colonial ties etc. This approach has been used in recent studies by Egger and Nelson (2011), Hoekman and Nicita (2011) and Berger, Easterly, Nunn, and Satyanath (2013). Previous

research that study the effect of sanctions on international did not control for MRT. Anderson and van Wincoop (2003) emphasize the importance of controlling for this, as otherwise the gravity model would produce inconsistent results.

There is also a primary concern of endogeneity emanating from reverse causality between trade and sanctions in that sanctions are more likely to be imposed on targets that have experienced a dip in trade with the sender. To minimize any potential bias from such endogeneity, we lag our variables of interest and also use the approach adopted by Berger et al. (2013). They use a dummy variable to control for the window of years before an intervention (in our case sanctions). Neuenkirch and Neumeier (2015) also use a similar approach when they argue that endogeneity may arise from the fact that the institutional, political and social environments may not be comparable during periods with and without sanctions. Thus, any impact on trade in sanction periods could be as result of that environment. In their approach, they restrict the control sample to a window of years before and after sanctions. This window of years around the sanction period makes factors such as the institutional, political, and social environment more comparable in order to derive an unbiased treatment effect. We adopt these various approaches to minimize any potential endogeneity.

4   Empirical Results

4.1   Comparison between threatened sanctions and imposed sanctions

Table 1 reports our baseline results testing the hypothesis that the effect of threatened sanctions on bilateral trade is similar to actual imposed sanctions. Our results differentiate between the three cases of sanctions: (1) when sanctions are threatened without any explicit imposition, (2) when sanctions are threatened and imposed, and (3) when sanctions are imposed without threats. The results indicate that the effect of threatened sanctions is qualitatively and quantitatively different from that of imposed sanctions. Whereas the imposition of sanctions (with or without a threat) has a large economic and statistical adverse effect by reducing bilateral trade ranging from 16% $[\exp^{(-0.179)} - 1]$ to 32% $[\exp^{(-0.387)} - 1]$ on average between the sender and target in sanction periods, threatened sanctions have a positive and significant effect of 17% to 29% on bilateral trade. In addition, the distributed lags for imposed sanctions also show strong persistence, although the magnitude of the coefficients declines in subsequent periods compared to the first period. Focusing on imposed sanctions, although there seems to be no major quantitative difference on exports when sanctions are imposed with or without threats. We also realize a less pronounced adverse effect on imports when there is a threat before actual imposition.

[Insert Table 1 here]

This may indicate that issuing a threat can actually undermine the efficacy of sanctions as the target may devise strategies to counteract any adverse effect when the sanctions are subsequently imposed. This is consistent with van Bergeijk (2009) argument that threatening without immediate imposition can allow targets to react by stockpiling or by other policies aimed at reducing their vulnerability to foreign economic pressure. As recently as 2012, it was reported that in the face of impending sanctions on Iran because of its nuclear enrichment ambitions, Tehran tremendously increased the import of wheat to 7 million tonnes from the world markets and about 1.8 million tonnes from the US (a principal sender of sanctions on Iran).[2].

For threats of sanctions without subsequent imposition, we see a large economic and statistical significant effect on exports compared to imports. A plausible explanation may relate to the credibility of the threat emanating from the greater flexibility with which sanctions can impede exports compared to imports. This therefore creates relatively more uncertainty

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[2]Reported by Reuters on March 16th, 2012. http://www.reuters.com/article/usa-wheat-iran-idUSL2E8EF9UU20120316

for exporters than importers as threats can easily be implemented at any time by the government or institutions in the sender states. Thus, exporters may act more rapidly when there is a threat. With a threat of sanctions to restrict imports, it may take a longer time. Hufbauer et al. (2007) explain that sanctions can more easily be imposed on exports than on imports. They attribute this to a strict regulation of imports, especially by international trade agreements and international organizations. For instance, the WTO can hinder a swift imposition of sanctions on imports. The positive effect of a threat of sanctions may be a sign that it can trigger stockpiling by domestic firms especially in sender states that rely on products from target states. The adverse effect of actually imposed sanctions can also be minimized when there are explicit threats before actual impositions. van Bergeijk (2009) argues that economic agents that will be negatively affected will take measures at the threat stage to minimize such adverse effects. Our results confirm this occurrence in the case of imports. The trade-deteriorating effect of imposed sanctions is significantly lower when there was an explicit threat prior to the actual imposition of sanctions.

[Insert Table 2 here]

Since we only see a more significant effect of threats of sanctions on exports, we test our second hypothesis by examining whether the positive effect of threats of sanctions is quantitatively different when threats are issued by different entities in the sender states. We categorized the issuing authorities into four main groups. These are (1) threats by governments when they are issued by a member of the state executive's staff, a state executive such as the President, the Prime Minister, the Chancellor or the government; (2) the threat is considered to emanate from the legislature and is made by a member or committee on the floor of parliament; (3) when the threat comes from state institutions or bureaucracies that handle issues related to international diplomacy, international trade and international security; and (4) when the threat is issued by heads of international organizations or by an organization that is mainly funded and controlled by the state (e.g. United States or United Kingdom Agency for International Development). Our results are reported in Table 2 and we find that the effect of threats emanating from trade and foreign service-related organization is more pronounced. Threats emanating from the government and the legislature are also strongly significant in contrast to those from state-funded organizations (eg. USAID). This indicates that reaction from economic agents may depend to a large extent on the source of the threat and therefore the credibility of the threat matters.

Turning to the core gravity model control variables, we find that the GDPs of both the sender and target are significant determinants of bilateral trade. The standard gravity model control variables have the expected signs and the size of the co-efficients are within a plausible range. In addition, membership of RTAs and the WTO are also significant determinants. All these results are in line with conventional expectations in gravity model estimations. We also find the democracy indicator variables for both the sender and the target are positive but not significant. The results for all the control variables and the multilateral resistance terms (MRT) are reported in Table 2A in Appendix 4. The multilateral resistance coefficients for various measures of trade costs are also comparable to those in studies such as Egger and Nelson (2011), Hoekman and Nicita (2011) and Berger et al. (2013) that use the Baier and Bergstrand's (2009)proxy.

[Insert Table 3 here]

To gain a better understanding of how trade flows react to the threat or imposition of different sanction instruments, we test our hypothesis 3 and the results are reported in Table 3. Notably, we see that the threat of import restrictions by a sender has a positive and significant effect on bilateral trade, as indicated in columns (1) and (2). Our results show that the positive anticipation effect of a threat is greatly influenced when a sender imposes import restrictions on goods from the target. This effect is two-way, as we see a significant effect on both exports and imports. Specifically, the results indicate that threats of import restrictions lead to an increase in trade between 28% and 34%. Similarly, we find that the

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threat of foreign aid being cut by senders significantly increases exports from the sender to the target. This is not surprising for two main reasons. First, foreign aid allocations are tied to donors' strategic interests. One of such interests involves using foreign aid to promote the exports of the donors'domestic firms (Alesina & Dollar, 2000). When donors choose to finance development projects that require supplies from their domestic firms. Thus, foreign aid increases trade between the donor and the recipient (Hühne, Meyer, & Nunnenkamp, 2014). Second, a threat of termination of foreign aid can be implemented easily and immediately. We also see this positive effect for other instruments such as total economic embargoes, economic blockages, asset freezes and travel bans but they are not statistically significant.

Focusing on the effect of the different instruments employed in actual impositions of sanctions shows that although, qualitatively similar (in terms of the sign of the coefficients) they are quantitatively different (in terms of the size and significance of the coefficients). The results in columns (3) and (4) show that comprehensive sanctions like total economic embargoes, where the sender stops the flow of all economic exchanges with the target have the most drastic effect in decreasing the trade flow between them. This applies to the two-way flows between them. On average, they reduce exports by 80% and imports by 91%. We also find that when foreign aid has actually been terminated, it also significantly reduces trade flow between the sender and the target. Surprisingly, the results show that although the effects of export and import restrictions are negative, they are statistically insignificant. However, this may be a sign that trade sanctions on their own may not significantly reduce trade flows unless they are complemented with financial sanctions.

[Insert Table 4 here]

We now examine whether there is any heterogeneous effect of sanctions on different SITC product classifications. Our main focus is on essential goods, which includes food and animal products and medicinal and pharmaceutical products. If these product categories are less adversely affected, then the sanction damage be may less, especially for the poor civilian population. In columns 1-3 of Table 4, we first look at the impact of sanctions on exports from sender to target states. The results show that imposed sanctions without any explicit threat adversely affect exports of essential products from the sender to the target. The adverse effect is more pronounced in terms of the size and significance of the coefficient for food and animal products compared to medicinal and pharmaceutical products. In contrast, we do not find significant effects on imports of essential products from the targets. This points to the fact that target states are the ones that have limited access to these essential products. Hufbauer et al. (2007) argue that most senders are relatively more developed and, thus have more industrial capacity in the production of these essential products. Targets tend to be more dependent on senders for supplies of these essential commodities. This may explain why many studies find detrimental consequences for target states such as increases in malnutrition, infectious disease and infant mortality.

4.2 Robustness

4.2.1 Endogeneity concerns

A primary concern in our baseline estimation is endogeneity arising from different sources. One of the sources is omitted variable bias. Omitted variable bias may not be a serious concern as our baseline equation controls for both country-pair time invariant factors as well as an exhaustive set of time-varying variables. However, reverse causality is a potential source of endogeneity, in particular when senders impose or threaten sanctions on targets when the trade flow is already low. For instance, Jing, Kaempfer, and Lowenberg (2003) indicate that the choice of sanctions instrument is endogenous to the political process and policy outcomes sought by the sender. In a specific case of sanctions, Neuenkirch and Neumeier (2015) also argue that the imposition of sanctions might be a consequence of an environment that is regarded as bad by the sender and that the negative effect of the sanctions variable might be the direct negative effect of the targets' own policies. In such cases, the recommended

standard approach is the use of instrumental variables in a two-stage regression. However, for the cases of dyadic variables, the appropriate and valid instruments are difficult to find. Thus, we rely on other econometric methods that can equally produce consistent results in the face of possible endogeneity.

To minimize such potential endogeneity we use three approaches. In the first approach, we use the method employed by Berger et al. (2013) who show that sender interventions (In their case, the US Central Intelligence Agency) are more common in countries, when the country has experienced a preceding decline in its imports of the senders' products. To minimize this source of endogeneity, they control for a pre-intervention dip by using an indicator variable that equals one if the observation is within a 5-year window around the sanction period (both before and after the year in which the sanctions were threatened or imposed). In a second approach, we resort to first-differencing (FD) of our baseline equation. Baier and Bergstrand (2007) argue that FD data provide better estimates of the average treatment effect. In addition, it has other advantages as it can control for serial correlation, possible unit-root trends and also potentially spurious regressions. Clemens, Radelet, Bhavnani, and Bazzi (2012) identify FD as way of controlling for reverse causality and suggest it is more transparent and efficient than using weak instruments. In a last approach we use a two-step system GMM estimator, in which the lagged values of the possible endogenous variables are used as instruments. This approach also corrects for mean-reverting dynamics or path dependence which often characterizes trade relationships, by including the lagged value of the dependent variable as covariates. Fuchs and Klann (2013) use the same approach. In this approach we treat threats and impositions of sanctions as endogenous variables and set the maximum number of lags to five in order to restrict the moment conditions.

[Insert Table 5 here]

Table 5 reports our estimates when these different approaches are used to reduce any potential endogeneity. Columns (1) and (2) show the results when we use the dummy variable to control for a window of five years around the sanction periods. Our results remain consistent and the coefficients are economically and statistically significant. We realize that using this approach has also improved the significance of the threat of sanctions on imports from the targets. Now, we see the positive effect is signifcant at conventional level of 5%. Columns (3) and (4) of Table 5 also report the results when we use the first-differencing approach. Our results remain significant but the magnitude of the coefficient becomes less pronounced. However, they are still economically significant. In the GMM estimation, we specify the main variables of interest (threat and imposition) as endogenous variables and also include the first lag of the dependent variables as additional explanatory variables. The results are shown in columns (5) and (6) of Table 5. The coefficients for lagged exports and imports are positive and strongly significant. The GMM coefficients for the sanction variables are reported with the tests for over-identification (Hansen J test) and autocorrelation, showing no sign of misspecification. These coefficients remain robust when we use the dynamic estimation method.

5   Conclusion

Although there are increasing numbers of both theoretical and empirical studies on sanctions, they are mostly restricted to the actual imposition of sanctions. The majority of these studies limit their analysis to the sanction period and do not cover the period prior to the imposition of the sanctions. Thus, there is a limited number of studies that analyze the economic implications of a threat of sanctions. This gap in the literature can be explained by the fact that there used to be no detailed compilation of sanction cases that differentiated between threats and actual impositions. Thus, we know little about what transpire between the sender and its target in terms of dyadic trade at the stage when sanctions are threatened. However, with the recent introduction of the Threat and Imposition of Economic sanctions database by Morgan et al. (2014) this gap can now be adequately addressed.

This paper has provided the first empirical analysis comparing the effect on bilateral trade of threatened sanctions to that of imposed sanctions. It provides evidence that the threat stage has important consequences for international trade between the sender and its target. More precisely, the empirical results show that the impact of the threat of sanctions is qualitatively and quantitatively different from the actual imposition of sanctions. Whereas the threat of sanctions has positive and significant effect on the bilateral trade flow between the sender and its target, the actual imposition of sanctions has a negative and significant effect. However, we only see a strongly significant positive effect of a threat of sanctions on exports. This is plausible as senders have greater flexibility in imposing sanctions on exports compared to imports. The economic significance of the magnitude of the effect also appears to decline over time. The positive effect of a threat of sanctions is aligned with the theoretical argument of van Bergeijk (2009) that the time dimension gives the agents both within the sender and target economies the ability to react by stockpiling or by adopting other strategies that can minimize the economic pressure of the sanctions.

For economic agents to adjust or adopt countervailing measures at the threat stage, the threat must be credible enough for the agents to react instantaneously or before the actual imposition. Thus, the paper has also analyzed whether different sources of threats play any significant role in the positive impact of sanctions on exports. The results show that threats emanating from foreign service and trade-oriented institutions have a more pronounced positive impact. This may be because of the proximity of these institutions to exporter and importer associations and hence threats from them may be considered more likely to be imposed.

Turning to the heterogeneous effect of sanctions, first, we examined the effects of different sanction instruments when imposed by the senders. Our results show that total economic embargoes have the most drastic impact on the trade flow between the sender and the target. In addition, foreign aid cuts also have adverse effect on the bilateral trade between the sender and its target. Examining sanctions instruments that are construed as smart sanctions, such as asset freezes and travel bans, show that they do not have a discernible effect. Second, we also examined the heterogeneous effects of sanctions on different product categories. The results are in line with the common finding that the imposition of sanctions contributes to high malnutrition, infant mortality and increases in the incidence of infectious diseases. Our results confirm that essential products such as food and medical supplies are also adversely affected. This adverse effect on these essential products only applies to exports from senders. This makes sense as the senders of sanctions are mostly relatively developed and have superior technologies in the production of such essential products.

A major implication from this paper is the result that threat before the actual imposition of sanctions can undermine the effectiveness of sanctions. The passage of time between the threat and the actual imposition can give economic agents time to adopt strategies *ex ante* that can minimize any negative effect the imposition will eventually have on them. The time dynamic is relevant in determining the effectiveness of sanctions because there is consensus that sanctions that span longer periods are less successful. This is mainly because the passage of time gives space for agents affected negatively to adopt strategies that can mitigate the economic costs of the sanctions. A possible instrument available to exporters and importers in both sender and target states to minimize future adverse effects is stockpiling. Stockpiling is a common phenomenon in the international trade of crude oil when agents anticipate unfavorable occurrences such as price increases or shortages.

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Appendix 1

Table A: List of sender states

		Freq.	Percent	Valid	Cum.
Valid	Afghanistan	52	0.51	0.51	0.51
	Argentina	28	0.28	0.28	0.79
	Armenia, Republic of	14	0.14	0.14	0.93
	Australia	120	1.18	1.18	2.11
	Belarus	18	0.18	0.18	2.29
	Brazil	69	0.68	0.68	2.97
	Burundi	90	0.89	0.89	3.85
	Cambodia	20	0.20	0.20	4.05
	Canada	826	8.14	8.14	12.19
	Central African Republic	18	0.18	0.18	12.37
	Chad	20	0.20	0.20	12.57
	Chile	27	0.27	0.27	12.83
	China	221	2.18	2.18	15.01
	Colombia	164	1.62	1.62	16.63
	Denmark	19	0.19	0.19	16.81
	Egypt	100	0.99	0.99	17.80
	El Salvador	20	0.20	0.20	18.00
	France	277	2.73	2.73	20.73
	Germany	568	5.60	5.60	26.32
	Ghana	15	0.15	0.15	26.47
	Greece	142	1.40	1.40	27.87
	Honduras	20	0.20	0.20	28.07
	Hungary	17	0.17	0.17	28.23
	India	382	3.76	3.76	32.00
	Indonesia	167	1.65	1.65	33.65
	Iran	151	1.49	1.49	35.13
	Iraq	106	1.04	1.04	36.18
	Israel	21	0.21	0.21	36.39
	Italy	52	0.51	0.51	36.90
	Jamaica	43	0.42	0.42	37.32
	Japan	145	1.43	1.43	38.75
	Kazakhstan	51	0.50	0.50	39.25
	Kenya	21	0.21	0.21	39.46
	Korea, Republic of	75	0.74	0.74	40.20
	Kuwait	56	0.55	0.55	40.75
	Libya	42	0.41	0.41	41.16
	Malaysia	21	0.21	0.21	41.37
	Malta	168	1.66	1.66	43.03
	Mexico	217	2.14	2.14	45.17
	Netherlands	11	0.11	0.11	45.27
	New Zealand	35	0.34	0.34	45.62
	Nigeria	43	0.42	0.42	46.04
	Pakistan	12	0.12	0.12	46.16
	Philippines	16	0.16	0.16	46.32
	Russian Federation	99	0.98	0.98	47.29
	Saudi Arabia	247	2.43	2.43	49.73
	Singapore	59	0.58	0.58	50.31
	Spain	67	0.66	0.66	50.97
	Sudan	21	0.21	0.21	51.18
	Sweden	21	0.21	0.21	51.38
	Syrian Arab Republic	114	1.12	1.12	52.51
	Tanzania	24	0.24	0.24	52.74
	Thailand	47	0.46	0.46	53.21
	Turkey	76	0.75	0.75	53.96
	Ukraine	18	0.18	0.18	54.13
	United Kingdom	593	5.84	5.84	59.98
	United States	4014	39.56	39.56	99.54
	Venezuela	12	0.12	0.12	99.66
	Zambia	24	0.24	0.24	99.89
	Zimbabwe	11	0.11	0.11	100.00
	Total	10147	100.00	100.00	

Appendix 2

Table B: List of target states

		Freq.	Percent	Valid	Cum.
Valid	Afghanistan	53	0.52	0.52	0.52
	Albania	56	0.55	0.55	1.07
	Algeria	52	0.51	0.51	1.59
	Antigua and Barbuda	19	0.19	0.19	1.77
	Argentina	180	1.77	1.77	3.55
	Australia	154	1.52	1.52	5.07
	Austria	57	0.56	0.56	5.63
	Azerbaijan	32	0.32	0.32	5.94
	Bangladesh	44	0.43	0.43	6.38
	Barbados	18	0.18	0.18	6.55
	Belarus	18	0.18	0.18	6.73
	Belgium	25	0.25	0.25	6.98
	Belize	24	0.24	0.24	7.21
	Benin	19	0.19	0.19	7.40
	Bolivia	42	0.41	0.41	7.82
	Bosnia and Herzegovina	34	0.34	0.34	8.15
	Botswana	18	0.18	0.18	8.33
	Brazil	169	1.67	1.67	9.99
	Bulgaria	32	0.32	0.32	10.31
	Burkina Faso	40	0.39	0.39	10.70
	Burundi	45	0.44	0.44	11.15
	Cambodia	66	0.65	0.65	11.80
	Canada	249	2.45	2.45	14.25
	Central African Republic	39	0.38	0.38	14.63
	Chad	18	0.18	0.18	14.81
	Chile	115	1.13	1.13	15.95
	China	234	2.31	2.31	18.25
	Colombia	36	0.35	0.35	18.61
	Congo, Republic of	16	0.16	0.16	18.76
	Costa Rica	28	0.28	0.28	19.04
	Cote d'Ivoire	36	0.35	0.35	19.39
	Croatia	34	0.34	0.34	19.73
	Cuba	50	0.49	0.49	20.22
	Cyprus	18	0.18	0.18	20.40
	Denmark	123	1.21	1.21	21.61
	Djibouti	18	0.18	0.18	21.79
	Dominica	18	0.18	0.18	21.97
	Dominican Republic	48	0.47	0.47	22.44
	Ecuador	50	0.49	0.49	22.93
	Egypt	139	1.37	1.37	24.30
	El Salvador	59	0.58	0.58	24.88
	Eritrea	17	0.17	0.17	25.05
	Estonia	34	0.34	0.34	25.39
	Ethiopia	71	0.70	0.70	26.09
	Fiji	62	0.61	0.61	26.70
	Finland	21	0.21	0.21	26.90
	France	279	2.75	2.75	29.65
	Gabon	40	0.39	0.39	30.05

Appendix 2

Table B: List of target states

	Freq.	Percent	Valid	Cum.
Gambia, The	20	0.20	0.20	30.25
Georgia	15	0.15	0.15	30.39
Germany	138	1.36	1.36	31.75
Ghana	20	0.20	0.20	31.95
Greece	62	0.61	0.61	32.56
Guatemala	43	0.42	0.42	32.99
Guinea	17	0.17	0.17	33.15
Haiti	44	0.43	0.43	33.59
Honduras	60	0.59	0.59	34.18
Hungary	45	0.44	0.44	34.62
Iceland	29	0.29	0.29	34.91
India	117	1.15	1.15	36.06
Indonesia	92	0.91	0.91	36.97
Iran	83	0.82	0.82	37.78
Iraq	36	0.35	0.35	38.14
Ireland	73	0.72	0.72	38.86
Israel	261	2.57	2.57	41.43
Italy	211	2.08	2.08	43.51
Japan	340	3.35	3.35	46.86
Jordan	87	0.86	0.86	47.72
Kazakhstan	18	0.18	0.18	47.90
Kenya	15	0.15	0.15	48.04
Korea, Democratic People's Rep. of	92	0.91	0.91	48.95
Korea, Republic of	225	2.22	2.22	51.17
Kuwait	21	0.21	0.21	51.37
Kyrgyz Republic	17	0.17	0.17	51.54
Lao People's Democratic Republic	76	0.75	0.75	52.29
Latvia	18	0.18	0.18	52.47
Lebanon	71	0.70	0.70	53.17
Lesotho	44	0.43	0.43	53.60
Liberia	34	0.34	0.34	53.94
Libya	68	0.67	0.67	54.61
Lithuania	17	0.17	0.17	54.77
Luxembourg	13	0.13	0.13	54.90
Malawi	37	0.36	0.36	55.27
Malaysia	167	1.65	1.65	56.91
Mali	20	0.20	0.20	57.11
Malta	19	0.19	0.19	57.30
Mauritius	18	0.18	0.18	57.48
Mexico	119	1.17	1.17	58.65
Mongolia	18	0.18	0.18	58.83
Morocco	40	0.39	0.39	59.22
Myanmar	40	0.39	0.39	59.61
Namibia	18	0.18	0.18	59.79
Nauru	17	0.17	0.17	59.96
Nepal	46	0.45	0.45	60.41
Netherlands	148	1.46	1.46	61.87
New Zealand	61	0.60	0.60	62.47
Nicaragua	41	0.40	0.40	62.88

Table B: List of target states

	Freq.	Percent	Valid	Cum.
Niger	20	0.20	0.20	63.07
Nigeria	27	0.27	0.27	63.34
Norway	89	0.88	0.88	64.22
Pakistan	83	0.82	0.82	65.03
Panama	49	0.48	0.48	65.52
Paraguay	43	0.42	0.42	65.94
Peru	50	0.49	0.49	66.43
Philippines	74	0.73	0.73	67.16
Poland	91	0.90	0.90	68.06
Portugal	117	1.15	1.15	69.21
Russian Federation	120	1.18	1.18	70.40
Rwanda	20	0.20	0.20	70.59
Samoa	18	0.18	0.18	70.77
Saudi Arabia	98	0.97	0.97	71.74
Senegal	20	0.20	0.20	71.93
Sierra Leone	20	0.20	0.20	72.13
Singapore	88	0.87	0.87	73.00
Slovak Republic	17	0.17	0.17	73.16
Slovenia	34	0.34	0.34	73.50
South Africa	194	1.91	1.91	75.41
Spain	151	1.49	1.49	76.90
Sri Lanka	57	0.56	0.56	77.46
St. Vincent and the Grenadines	18	0.18	0.18	77.64
Sudan	19	0.19	0.19	77.83
Sweden	70	0.69	0.69	78.52
Switzerland	81	0.80	0.80	79.31
Syrian Arab Republic	133	1.31	1.31	80.62
Taiwan	64	0.63	0.63	81.26
Tajikistan	17	0.17	0.17	81.42
Tanzania	33	0.33	0.33	81.75
Thailand	119	1.17	1.17	82.92
Togo	20	0.20	0.20	83.12
Trinidad and Tobago	20	0.20	0.20	83.32
Tunisia	11	0.11	0.11	83.42
Turkey	159	1.57	1.57	84.99
Uganda	82	0.81	0.81	85.80
Ukraine	53	0.52	0.52	86.32
United Kingdom	253	2.49	2.49	88.81
United States	688	6.78	6.78	95.59
Uruguay	43	0.42	0.42	96.02
Uzbekistan	17	0.17	0.17	96.19
Vanuatu	44	0.43	0.43	96.62
Venezuela	73	0.72	0.72	97.34
Vietnam	139	1.37	1.37	98.71
Zambia	18	0.18	0.18	98.89
Zimbabwe	113	1.11	1.11	100.00
Total	10147	100.00	100.00	

Appendix 3

Table 1A: Summary statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Threat without imposition	10147	.049	.216	0	1
Imposition without threat	10147	.06	.237	0	1
Imposition with threat	10147	.184	.388	0	1
Log exports	9549	19.479	2.792	3.449	26.595
Log exporter GDP	10081	13.242	2.521	4.72	16.505
Log Importer GDP	9934	10.954	2.533	4.038	16.505
Log exporter population	10126	4.404	1.571	-1.132	7.194
Log importer population	10123	3.068	1.715	-2.748	7.194
Exporter democracy	10147	.795	.404	0	1
Importer democracy	10098	.59	.492	0	1
RTA	10147	.07	.256	0	1
Common currency	10147	.024	.153	0	1
WTO/GATT	10147	.668	.471	0	1

Table 2A: Control variables for the main results in Table 1

VARIABLES	(1) lnexports	(2) lnexports	(3) lnimports	(4) lnimports
Log exporter GDP	0.578***	0.605***	0.746***	0.758***
	(0.122)	(0.132)	(0.0862)	(0.0911)
Log importer GDP	0.669***	0.682***	0.826***	0.803***
	(0.0703)	(0.0747)	(0.100)	(0.108)
Log exporter population	0.220	0.0753	0.582	0.587
	(0.558)	(0.615)	(0.423)	(0.506)
Log importer population	-0.587*	-0.561	-0.363	-0.329
	(0.337)	(0.358)	(0.373)	(0.401)
Exporter democracy	0.0734	0.123	-0.0332	-0.0249
	(0.113)	(0.115)	(0.150)	(0.152)
Importer democracy	0.0328	0.0382	-0.0865	-0.0829
	(0.0797)	(0.0812)	(0.0911)	(0.0946)
Regional trade agreement	0.372***	0.387***	0.244*	0.232*
	(0.127)	(0.137)	(0.128)	(0.141)
Common currency	0.0405	-0.124	0.697**	0.468
	(0.227)	(0.190)	(0.337)	(0.370)
WTO	0.478***	0.500***	0.468***	0.466***
	(0.101)	(0.105)	(0.109)	(0.118)
Multilateral resistance term				
Distance	-0.147	-0.118	-0.124	-0.119
	(0.0900)	(0.0950)	(0.0951)	(0.102)
Common language	0.0129	-0.0513	0.0203	0.165
	(0.306)	(0.329)	(0.294)	(0.308)
Colonial ties	0.143	0.151	-0.0437	-0.213
	(0.343)	(0.376)	(0.322)	(0.331)
Common currency	-0.309	-0.126	-0.686	-0.546
	(0.285)	(0.263)	(0.438)	(0.512)
Border	-0.0489	-0.0827	-0.210	-0.257
	(0.226)	(0.229)	(0.219)	(0.236)
RTA	-0.179	-0.134	0.0686	0.117
	(0.153)	(0.162)	(0.159)	(0.176)
WTO/GATT	-0.327	-0.389	-0.164	-0.173
	(0.224)	(0.239)	(0.203)	(0.222)
Constant	5.470*	5.444*	0.0404	-0.198
	(2.887)	(3.183)	(2.059)	(2.291)
Observations	9,293	8,540	9,321	8,553
R-squared	0.548	0.539	0.586	0.571
Number of countrypairs_id	398	398	399	399

Cluster robust standard errors at the level of country pairs in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 1:   The impact of threatened/imposed sanctions on international trade

VARIABLES	(1) lnexports	(2) lnexports	(3) lnimports	(4) lnimports
Threat(without imposition)$_t$	0.258***	0.123**	0.155*	0.0998*
	(0.0776)	(0.0494)	(0.0819)	(0.0604)
Threat(without imposition)$_{t-1}$		0.0842**		0.0157
		(0.0339)		(0.0386)
Threat(without imposition)$_{t-2}$		0.0882*		0.0677
		(0.0524)		(0.0507)
Imposition (without threat)$_t$	-0.293***	-0.181***	-0.387***	-0.240***
	(0.104)	(0.0696)	(0.126)	(0.0805)
Imposition (without threat)$_{t-1}$		-0.118**		-0.181**
		(0.0511)		(0.0710)
Imposition (without threat)$_{t-2}$		-0.0750		-0.166*
		(0.0669)		(0.0902)
Imposition (with threat)$_t$	-0.298***	-0.171***	-0.179**	-0.108*
	(0.0820)	(0.0499)	(0.0820)	(0.0556)
Imposition (with threat)$_{t-1}$		-0.0824***		-0.0505
		(0.0313)		(0.0332)
Imposition (with threat)$_{t-2}$		-0.149***		-0.109**
		(0.0512)		(0.0473)
Constant	5.470*	5.444*	0.0404	-0.198
	(2.887)	(3.183)	(2.059)	(2.291)
Observations	9,293	8,540	9,321	8,553
R-squared	0.548	0.539	0.586	0.571
Number of country-pairs_id	398	398	399	399
MTR Proxies included	Yes	Yes	Yes	Yes
Fixed and time effects	Yes	Yes	Yes	Yes

Cluster robust standard errors at the level of country pairs in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2: The impact on exports of threats emanating from different sources

VARIABLES	(1) lnexports	(2) lnexports	(3) lnexports	(4) lnexports
Threat issued by government	0.219***			
	(0.0838)			
Threat issued by trade/foreign institution		0.315***		
		(0.101)		
Threat issued by the legislature			0.272***	
			(0.0861)	
Threat issued by International organizations.				0.257*
				(0.137)
Constant	5.733**	5.788**	5.667*	5.777**
	(2.888)	(2.889)	(2.889)	(2.890)
Observations	9,029	8,911	9,027	8,867
R-squared	0.545	0.546	0.549	0.543
Number of country-pairs_id	398	398	398	398

Cluster robust standard errors at the level of country pairs in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Impact of different types of instruments on trade

	Threat		Imposition	
	(1)	(2)	(3)	(4)
VARIABLES	lnexports	lnimports	lnexports	lnimports
Total economic embargo	0.635	0.202	-1.567***	-2.449***
	(0.729)	(0.197)	(0.420)	(0.502)
Partial economic embargo	0.0558	0.0278	-0.345*	-0.150
	(0.290)	(0.241)	(0.202)	(0.212)
Import restriction	0.249***	0.238***	-0.0286	-0.0342
	(0.0712)	(0.0785)	(0.0474)	(0.0839)
Export restriction	0.142	0.0803	-0.231	-0.0638
	(0.0936)	(0.126)	(0.177)	(0.280)
Economic blockade	0.171*	0.139	-0.140	-0.442
	(0.0887)	(0.127)	(0.222)	(0.316)
Asset freeze	0.172	0.246	-0.566*	-0.378
	(0.584)	(0.475)	(0.326)	(0.498)
Foreign aid cut	0.202**	0.0661	-0.181***	-0.177*
	(0.0811)	(0.105)	(0.0643)	(0.0937)
Travel ban	-0.0127	0.229	0.000502	0.315
	(0.138)	(0.257)	(0.172)	(0.284)
Economic agreement ban	0.127	0.293*	-0.382	-0.196
	(0.111)	(0.174)	(0.326)	(0.450)
Imposition (without threat)	-0.291***	-0.387***		
	(0.104)	(0.126)		
Imposition (with threat)	-0.274***	-0.175**		
	(0.0758)	(0.0757)		
Threat (without imposition)			-0.0231	-0.00297
			(0.0362)	(0.0513)
Constant	5.455*	0.0247	5.803**	0.159
	(2.894)	(2.062)	(2.773)	(2.006)
Observations	9,293	9,321	9,293	9,321
R-squared	0.548	0.586	0.571	0.611
Number of country-pairs_id	398	399	398	399

Cluster robust standard errors at the level of country pairs in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4: The impact of sanctions on essential products

	Exports			Imports		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Essential products	Food and animal products	Medicines	Essentials products	Food and animal products	Medicines
threat	0.0634	0.0694	0.123	0.0715	0.00241	0.128
	(0.0826)	(0.0890)	(0.0897)	(0.0739)	(0.0788)	(0.139)
sanction2	-0.0382	-0.0396	-0.124*	-0.0273	-0.182	-0.0311
	(0.0841)	(0.102)	(0.0751)	(0.0798)	(0.130)	(0.140)
sanction3	-0.192***	-0.229***	-0.136*	0.0149	0.00453	-0.00781
	(0.0690)	(0.0734)	(0.0800)	(0.0505)	(0.0594)	(0.0872)
Constant	2.194	-2.004	-7.036	3.522	-4.939	4.445
	(3.759)	(3.481)	(5.393)	(3.005)	(3.248)	(5.363)
Observations	6,195	6,756	6,284	5,162	6,783	5,207
R-squared	0.428	0.286	0.457	0.478	0.238	0.449
Number of country-pairs_id	345	371	348	334	372	336

Cluster robust standard errors at the level of country pairs in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5: Possible endogeneity concerns

VARIABLES	Five-year window		First-differencing		GMM	
	(1)	(2)	(3)	(4)	(5)	(6)
	lnexports	lnimports	D.lnexports	D.lnimports	lnexports	lnimports
L.lnexports					0.345***	
					(0.00395)	
L.lnimports						0.298***
						(0.00431)
Threat(without imposition)	0.246***	0.183**			0.0988***	0.0133*
	(0.0856)	(0.0898)			(0.00676)	(0.00749)
Imposition(without threat)	-0.290**	-0.422***			-0.0738***	-0.211***
	(0.112)	(0.136)			(0.00719)	(0.00838)
Imposition(with threat)	-0.288***	-0.205**			-0.0967***	-0.0104**
	(0.0904)	(0.0918)			(0.00557)	(0.00505)
FD.Threat(without imposition)			0.0692***	0.0409		
			(0.0249)	(0.0252)		
FD.Imposition(without threat)			-0.0771**	-0.103**		
			(0.0342)	(0.0402)		
FD.Imposition(without threat)			-0.0898***	-0.0480**		
			(0.0203)	(0.0193)		
Constant	6.956***	4.319***	-0.00379	-0.00286	-0.544	2.036
	(1.743)	(1.406)	(0.0191)	(0.0206)	(1.328)	(1.332)
Observations	9,293	9,321	8,778	8,802	8,335	8,350
R-squared	0.548	0.583	0.065	0.045		
Number of country-pairs_id	398	399			391	395
P-value for Hansen J test					1.00	1.00
P-value for first-order auto-correlation test					0.000	0.000
P-value for second-order auto-correlation test					0.871	0.976

Cluster robust standard errors at the level of country pairs in parentheses

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