WARS, SANCTIONS AND EXPORTS: IS THE MENA SINGULAR?

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Low participation in World exchanges and persistent political tensions are major features of the MENA. We investigate the impact of such tensions on trade considering simultaneously armed and non-armed conflicts. Import restrictions and inter-state wars appear as the most harmful to exports. The effect of import restrictions is, however, larger and manifest itself earlier than wars. We also find that democracy foster trade. This can reduce political tensions which is, in turn, favorable to trade. The effect of democracy on trade and peace can be snowballing. Hence, the democratic deficit in the MENA deserves more attention than presently.

Introduction

Political tensions and low integration in the world economy are two major features of the Middle East and North Africa (MENA) region. Efforts to increase such trade through integration agreements have been a failure, despite the fact these efforts started earlier than in any other developing region and have resulted in the highest number of signed agreements. Various papers have examined whether and why trade is low in the MENA region. It appears that there are two important reasons. First, governments maintain a high number of de jure and de facto obstacles to trade. In addition, political tensions are omnipresent in the Region and limit cooperation (see Sekkat, 2014 for a review).

Bhattacharya and Wolde (2010) show that some MENA countries are trading up to 86 percent less than what would be expected given the characteristics of the economies. Söderling (2005), focusing on the possible existence of unexploited trade opportunities, shows that there are many non-EU export markets that are underexploited. Research investigating the determinants of trade in MENA countries confirm the explanations linked to trade policy (including trade agreements), foreign exchange policy, business climate (including infrastructure), governance, low exports sophistication and low

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productivity (Sekkat and Veganzones, 2007; Méon and Sekkat, 2004; Abdmoulah and Laabas, 2010). Many of these reasons can be explained by political tensions among MENA countries.

On the political front, while the number of "fierce" intra-regional wars has been very limited since the Second World War, political tensions between states are omnipresent. However, the reasons for this tension have changed over time. As described by Santini (2017), during the 1950s and 1960s, the region witnessed a sort of "Arab Cold War" driven by Arab leaders' deep ideological divisions and reflecting the broader global conflict between socialist and capitalist countries. Starting in the 1970s, an era of intra-regional cooperation, motivated by a common antagonism toward Israel, took place. After the Iranian revolution in 1979, the Arab identity of the region became the basis of regional order. Finally, the region entered, by the early 2000s, into a "New Regional Cold War" rooted in opposition between Sunni and Shiai blocs.

Against this background, the present paper investigates to what extent MENA's political tensions adversely affect trade. This paper draws on the economic and political science literature that examines the relationship between trade and wars. As the number of "fierce" MENA wars has been very limited while political tensions have been omnipresent, I extend the analysis to other expressions of political tensions; namely, sanctions. Sanctions are numerous and concern diplomatic relationships, athletic or cultural events, foreign goods and the property of targeted foreign citizens. The sanctions may be combined to achieve the highest impact. The United States is one of the leaders in imposing sanctions[1] (Kilchevsky et al., 2007). Sanctions are more popular than wars because they are thought to induce lower costs of solving disputes (Davis and Engerman, 2003). They can be used for different reasons (Heilmann, 2016), such as disputes over territories (e.g., boycott of Japanese goods by China in 2012 due to the territorial dispute over a group of nearby uninhabited islands), attitudes toward some issues (e.g., the U.S. boycott of French products because of different sentiment toward the Iraq War in 2003) or perceived humiliation (e.g., in 2005 and 2006, Muslims countries' boycott of Danish goods as a response to the publication of the Muhammad cartoons). However, sanctions, like wars, may be ineffective, unfair or both. More specifically, they prove ineffective when they fail to fulfill their stated objective and are unfair when imposed by large and wealthy countries without substantiated justifications (McCormack and Pascoe, 2017; Haidar, 2017).

The above literature has been subject to qualifications. First, the underlying assumption that economic exchange between countries will cease or be substantially reduced because of conflicts has been questioned. Barbieri and Levy (1999) draw numerous examples from history where trade between adversaries continues during wartime.[2] They even find that in most cases war has no impact on trade. Sometimes, a temporary negative effect on the level of bilateral trade emerges, but, in general, there is no permanent negative effect.

[1.] The U.S has imposed approximately 117 sanctions between 1970 and 1998

[2.] They examined the cases of wars between Argentina and the UK, the UK and China, Cyprus and Turkey, Greece and Turkey, Uganda and Tanzania, the UK and Egypt, and the U.S. and China.

A second qualification is that the links between war and trade are not automatic. They depend on a number of factors, including domestic institutions, civil liberties, government accountability, electoral effectiveness and transparency. Much empirical evidence lends support to this claim. Gelpi and Grieco (2008), examining the sensitivity of national leaders to the costs of conflict in terms of trade losses, confirm that democratic states are unlikely to initiate conflicts. Mansfield et al. (2008), investigating the relationship between democracy and economic integration, find that the more democratic a country, the more likely it is to sign integration agreements. Finally, Kono (2008) shows that public support for free trade leads to lower tariffs and that the liberalizing effects of such support are both larger and more significant in more democratic countries.

The third qualification is that war is not the only way to deal with inter-state tensions, and other mechanisms might be superior (more gains and lower costs to aspects such as human life and infrastructure). Alternatives are sanctions that can take different forms (Davis Engerman, 2003). They can be situated between diplomatic and military measures. Following Hufbauer et al. (2020), through their use as tools of military containment, sanctions can play an underappreciated role in international politics. To our best knowledge, our paper is not only the first to examine the impact of sanctions on MENA' trade, it is also the first to compare the effectiveness of sanctions and wars.

Taking these qualifications into account, this paper investigates the impact of armed and non-armed conflicts on trade in the MENA region. The contributions of this paper are threefold: First, I evaluate the relationship between conflict and trade in 18 MENA countries. While the literature assumes, in general, that trade will cease or substantially decrease after the outbreak of conflicts, I seek to test this assumption's validity.

Second, I focus on a particular region: the MENA. The idiosyncrasies of this region as a significant oil exporter with countries of vastly differing wealth, a shared religion with differing practices and a complex relationship with Israel offers a unique opportunity to test whether the literature findings are universal or are dependent on time and place (Kilchevsky et al., 2007). Mansfield and Pollins (2001) show that the relationship between trade and wars might differ over time and across countries. In this case, ignoring important regional differences may impact the conclusions. Therefore, this paper moves from the general insight offered by past studies to more region-specific investigations and analyses at lower levels of aggregation.

Third, in evaluating the relationship between conflict and trade, I consider other expressions of dispute beyond war. I consider the suspension of military, diplomatic, travel and commercial collaborations and compare their effects to those of war. Such sanctions might be popular when they substitute for war and can be a lower cost method of punishing or settling disputes between countries (Davis and Engerman, 2003).

The next Section reviews the relation of this paper to the literature. The following Section presents the data, their sources and some summary statistics. Afterward, the methodology is discussed before presenting results.

Empirical Literature on Conflict and Trade

Conflicts between states can be militarized (i.e., war[3]) or non-militarized. Under the heading of militarized conflicts, the literature distinguishes between threat of war, display of forces and "hard war". Non-militarized disputes span a larger spectrum, including financial measures, commercial sanctions, diplomatic restrictions and suspension of aid. The literature pertaining to conflicts and trade naturally split into two branches. A first branch, mainly developed by political scientists, investigates the impact of economic ties on the likelihood of conflicts between countries. The second branch, mainly of concern to economists, looks at the impact of conflicts on inter-country economic ties. Our paper belongs to the second branch.

While most analysis of the conflicts debate focuses on militarized disputes, analysis on sanctions is growing. Sanctions are initiated by one party, called the sanctioning country, against another, referred to as the sanctioned. The reasons for sanctions have varied over time. Between 1914 and 1945, sanctions were typically deployed to avoid or stop military ventures. In subsequent years, sanctions have been used for a broader range of goals, such as pushing freedom and democracy, protecting the environment and avoiding nuclear proliferation. An additional type of sanctions is reciprocal sanctions, in which the sanctioned party sanctions the sanctioning ones as a response. However, this type of sanction tends to be ineffective (Davis and Engerman, 2003).

While the use of sanctions imposes costs on the sanctioned countries, it is not costless for the sanctioning. Beside the cost of implementation, the sanctioning countries' firms are likely to lose sales and trade and experience a disruption to aid or financial flows. Moreover, the sanctioned can respond by diversifying sources and destinations of exchange flows or restructuring production. Hence, the choice and effectiveness of sanctions depend on many factors such as public opinion, technology and the power relations between and within nations (Elagab, 1988).

Impact of wars on economic ties

Here, I focus on the role of inter-state tensions in hampering international economic ties although the relationship can be bidirectional (Gowa and Mansfield, 1993). Keshk et al. (2004) develop and apply recent advances in simultaneous equation estimation that allow for the incorporation of discrete dependent variables to examine the impact of war on trade. They find that while conflicts inhibit trade, trade does not bring peace. Blomberg and Hess (2006) compare the trade cost of violence to the cost of trade barriers. Using data from 177 countries over more than 30 years, they find that peace has a strong statistical and economic impact on trade. When distinguishing among four categories of violence—terrorism, external war, revolutions and inter-ethnic fighting—Blomberg and Hess find that the cost of terrorism and internal or external conflict is as high as the cost of a 30% percent increase in trade barriers. This impact is larger than the cost of border and language barriers and equivalent to the reduction in tariffs associated with Generalized System of

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[3.] Today, cyber war is becoming a common means of attack (Davis and Meunier, 2011).

Preferences (GSPs) or WTO participation. The negative effect of internal conflicts on trade is confirmed by Magee and Massoud (2011) using more precise indicators of conflicts. They use measures of conflict based on an events dataset from 1990–2004. The dataset contains 9,507,513 events and is constructed based on machine-coded readings of Reuters news reports. They find robust evidence that any type of conflict within a country reduces its international trade. The results are similar whether openness is measured using trade flows or FDI and whether internal conflict is measured using political, economic or military issues.

Wars do not have costs only on the belligerent. Neutral parties might suffer non-negligible costs as well. In other words, wars can have collateral damage by creating a large negative externality on the trade of these neutral parties. Glick and Taylor (2010) examine the externality issue as well as the question about the persistent effect of wars—that is, whether trade ever resumes at its pre-war level. The analysis is conducted using a sample of 172 countries over the period 1870–1997. The results support the existence of the negative externality. Wars depress trade between belligerents and neutrals by about 12%. Moreover, the effects persist for 8 years after the start of a war. When the war ends, the impact on trade declines over time, and trading returns to its peacetime levels about a decade later. Finally, major wars are especially damaging to trade for both neutral and belligerent parties.

Karam and Zaki (2016) focus on the impact of war on trade in the MENA region using an augmented gravity model. They distinguish between two types of armed conflicts: conflicts where at least one party is a government and conflicts between non-governmental antagonists. The authors find that, in general, conflicts adversely affect trade. Considering a sectoral disaggregation of the economy, they do not find evidence that conflict affects trade in services. In contrast, non-state conflicts are detrimental to manufacturing trade.

Impact of sanctions on economic ties

As previously noted, war is not the only means to deal with inter-state tensions. Different forms of non-militarized sanctions are used by countries to settle their conflicts. Davis and Meunier (2011) examine the impact a series of "negative events"—such as demonstrations, reduction of diplomatic relations, expulsion, seizure of assets or the use of force—on trade and investment. More precisely, they focus on the bilateral relationships between the U.S. and France in 2003 and between Japan and China from 1990 to 2006. Overall, they find no evidence that these tools of coercion harmed economic relations. The negative events reported in the media were not associated with any reduction of trade and investment flows for either the U.S. or Japan.

Heilmann (2016) focuses on the impact of consumer boycotts on bilateral trade relations. Previous studies had not consider consumer boycotts. The author considers the boycotts of Danish goods by Muslim countries, the boycott of Japanese goods by China in 2012, the boycott of French products in the U.S. in 2003 and the Turkish boycott of Israeli goods. The author finds that these actions were highly detrimental to bilateral trade of both goods and services. There is, however, a high level of heterogeneity in the impact of the

various boycotts. The average one-year reduction in imports equals 18.8% of total trade with the Muslim boycott, 2.7% with the Chinese boycott and 1.7% with the U.S. consumer boycott. Regarding the Israeli Turkish case, no negative effect on Israeli exports to Turkey was found but Israel reduced its imports from Turkey by 12.3%.

Before imposing sanctions, countries can first threaten to do so. The threat might be sufficient to settle the dispute and avoid the costs of sanctions to both countries. Afesorgbor (2019) compares the effect of threats of sanctions with their imposition over the period 1960–2009. The findings reveal that threats and impositions have qualitatively and quantitatively different effects. While impositions decrease bilateral trade, threats generate higher flows. One explanation is that in the case of threats, economic agents build up stocks prior to the potential impositions, thereby minimizing the adverse consequences of sanctions.

Instead of imposing sanctions on a whole economy or on a whole sector, more targeted sanctions can be implemented toward individuals or entities. These include travel bans, asset freezes and complete prohibition of trade, financial transactions or transfer of certain technologies. Ahn and Ludema (2020) examine the effectiveness of these sanctions by taking into account the endogenous defensive response of the government of the targeted entity. Using data on nearly 3,000 firms throughout the world and a difference-in-difference approach, they compare the financial performance of the targeted firms to their non-targeted peers before and after sanctions were imposed. The findings indicate that targeted sanctions do impose considerable economic costs on targeted firms, but because the governments engage in shielding, the burden of the sanction is in reality shifted from the targeted firms to their governments.

While sanctions impose economic costs on targeted firms or countries, they can also create costs for the sanctioning body. In this vein, Besedeš et al. (2021) analyze the impact on and the responses of German non-financial firms to Germany imposing financial sanctions on some countries. They analyze the impact of sanctions targeting countries on German financial performance over the period 1999–2014. They find that the German firms exhibit lower performance after the imposition of sanctions and that these firms expand their activities with non-sanctioned countries. Moreover, firms continuing business with sanctioned countries tend to be disproportionately large and often have alternative business opportunities. Finally, no effect of sanctions on other measures of firm performance such as employment or total sales is found. Overall, it seems that the economic costs of financial sanctions on the sanctioning country are limited.

Haidar (2017) studies the responses of Iran (the sanctioned country) to the U.S.'s unilateral economic sanctions. In his paper, he focuses on the extent and mechanisms of Iranian export deflection. Using data on more than 1.81 million Iranian export transactions, the paper finds that two-thirds of the value of Iranian exports thought to be destroyed by sanctions have been diverted to non-sanctioning countries. Moreover, exporters to non-sanctioning countries increased their exports after sanctions. The effects on firm depend on exporter size, past export status and pricing strategy. Some exporters reduced their product prices when they diverted exports to new destinations. Larger exporters diverted more of

their exports than smaller exporters. In sum, export sanctions seem less effective in a more globalized world, as exporters can divert exports from one destination to another.

Data and Statistical Analysis

Data

I apply the gravity approach and combine various economic and political data coming from different sources. The dependent variable is the bilateral exported goods of MENA countries to different countries, including other countries in the MENA region. The combination of different data sources creates comparability issues, and the data have to be homogenized. The objective is to build a sample that reflects the relationship between the 18 MENA countries and the largest possible number of their partners. I end up with a total of 128 potential partners (18 MENA and 110 non-MENA; see Appendix A) over the period 1970–2015. The data are the following:

1. **Gravity variables** include GDPs, distance and bilateral exports from each MENA country to 127 potential partners. The data are drawn from the CEPII website. Other variables also considered include common membership of PTAs and membership of WTO as trade policy indicators and colonial linkages, similar languages and contiguity and indicators of geographical/historical characteristics.

2. **Political data** are drawn from Polti iv which provides substantial information on regime type and behavior from 1800 to 2017. Here, I focus primarily on autocracy score, democracy score and the durability of each regime (in years). The first two scores scale from 1–10, with higher values indicating the strength of the autocracy or democracy.

3. **Conflicts data** combine three types of information: inter-state wars, sanctions and details of sanctions. I focus on conflict involving at least one MENA country:

   a. I draw from the Uppsala Conflict Data Program (UCDP) dyadic dataset information regarding inter-state wars, which covers a large number of wars over the period 1946–2019. The main unit in this dataset is "Conflict Dyad", which reports armed conflicts between two parties, of which at least one is a government. The conflict is reported if it results in at least 25 battle-related deaths in a calendar year (Harbom et al., 2008; Pettersson and Öberg, 2020; Pettersson, 2020). Here I focus on the case where both parties in the armed conflict are states.

   b. From the Global Sanctions Database (GSDB), I draw data concerning sanctions. The dataset covers 729 sanctions from 1950–2016. The sanctions are publicly traceable and can be unilateral, bilateral or multi-lateral. Sanctions cover five broad categories: exports of arms, military cooperation, trade, finance and freedom of travel (Felbermayr et al., 2020).

   c. The Threat and Imposition of Sanctions (TIES) Dataset gives more details on trade sanctions. It covers the period 1945–2005 and distinguishes among total economic embargo, partial economic embargo, import restriction and export restriction. The dataset also covers other sanctions such as asset freeze, termination of foreign aid, travel restrictions and diplomatic sanctions. The latter is further split into

the following four dimensions: expulsion of ambassador, recall of ambassador, temporary closing of embassies and the ending of diplomatic contacts (Clifton et al., 2014).

Statistical analysis

Figure 1 presents the shares of trade, excluding fuel, and GDP in World's total by group of countries. Unsurprisingly, the highest share corresponds to OECD for both trade and GDP. These shares are of comparable magnitude. The second most important shares correspond to East Asia. Again the shares are of comparable magnitude. The share in trade of the MENA is the lowest, but Sub-Saharan Africa, and is half of the share in GDP which put the Region among the worst performers.
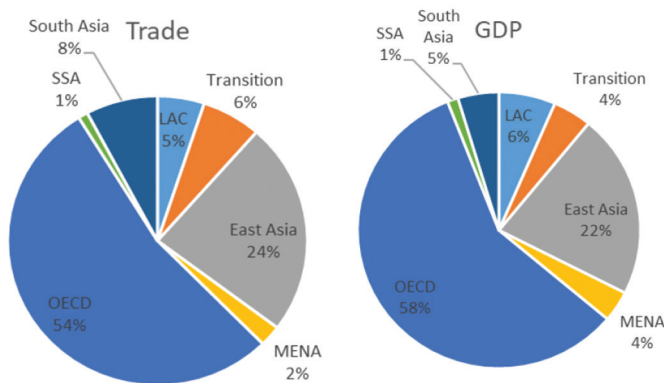

Figure 1.   Shares of trade and GDP in World's total by group of countries (1970–2015)

Source: Own calculation from the sample

Table 1 lists the number of bilateral PTAs involving at least one MENA country by region of the world as well as MENA countries which are members of the WTO. The number if intra-MENA PTAs (17) suggests a high degree of integration within the region in contrast to the low level of intraregional trade shown above. The region with the second highest number of PTAs with MENA is the OECD (7). Turkey is the country in the MENA region with the highest number of intra-regional PTAs (5). Finally, of the 18 MENA countries, one-third are not members of the WTO.

Table 1.   MENA countries with WTO membership and their
PTAs by partner's region (over the period of observation)

Partner's region	Number of bilateral PTAs involving at least one MENA country							Member of the WTO
	LAC	Transition	East Asia	MENA	OECD	SSA	South Asia	
Countries								
Algeria	0	0	0	0	0	0	0	Yes
Bahrain	0	0	0	0	1	0	0	Yes
Egypt	0	0	0	1	0	0	0	Yes

Partner's region	Number of bilateral PTAs involving at least one MENA country							Member of the WTO
	LAC	Transition	East Asia	MENA	OECD	SSA	South Asia	
Iran	0	0	0	1	0	0	0	NO
Iraq	0	0	0	0	0	0	0	NO
Israel	1	0	0	1	2	0	0	Yes
Jordan	0	0	0	1	2	0	1	Yes
Kuwait	0	0	0	2	0	0	0	Yes
Lebanon	0	0	0	1	0	0	0	NO
Libya	0	0	0	0	0	0	0	NO
Morocco	0	0	0	2	1	0	0	Yes
Oman	0	0	0	0	1	0	0	Yes
Saudi Arabia	0	0	0	0	0	0	0	NO
Syria	0	0	0	1	0	0	0	NO
Tunisia	0	0	0	1	0	0	0	Yes
Turkey	1	1	1	5	0	0	0	Yes
UAE	0	0	0	1	0	0	0	Yes
Yemen	0	0	0	0	0	0	0	Yes
Total	2	1	1	17	7	0	1	

Source: WTO

Now, I turn to democracy. The degree of democracy is an important determinant of openness to trade. Table 2 gives the democracy scores of MENA countries and regions of the world, with scores varying between 0 and 10. The higher the score, the more democratic is the country or the region. Perhaps unsurprisingly, the least democratic region is MENA, with half the score of the SSA. Within the MENA region, Kuwait, Libya, Oman, Saudi Arabia, Syria and the UAE have scores of zero, meaning no democracy at all. In contrast, Lebanon, Israel and Turkey appear as the most democratic with scores of 5.71, 7.45 and 7.5, respectively. The rest of the countries are all below 1.2, indicating low levels of democracy.

Table 2.   Average democracy scores by country and region

Democracy Scores

MENA Countries		Regions	
Algeria	1.02	LAC	5.4
Bahrain	0.02	Transition	5.6
Egypt	0.14	East Asia	6.98
Iran	0.68	MENA	1.12
Iraq	0.59	OECD	9.67
Israel	7.45	SSA	2.25
Jordan	1.11	South Asia	3.20

(*Contd.*)

Democracy Scores

MENA Countries		Regions
Kuwait	0.00	
Lebanon	5.71	
Libya	0.00	
Morocco	0.09	
Oman	0.00	
Saudi Arabia	0.00	
Syria	0.00	
Tunisia	0.61	
Turkey	7.50	
UAE	0.00	
Yemen	1.19	

Source: Politi iv

The data on sanctions and inter-state wars are key to this paper's analysis. Table 3 gives the number of sanctions and inter-state wars involving at least one MENA country by region of the antagonist. Of 460 incidents over the period of observation, 228 (the largest share) occurred between MENA countries. The SSA stands as the second in terms of confrontation with the MENA (174), while all other regions have a low number of incidents. The share of inter-state wars in total incidents is low, although non-negligible.

Table 3.   Sanctions and wars involving MENA countries by region
of the antagonist (over the period of observation)

Types of measures	Region							Total
	Lac	Transition	East Asia	MENA	OECD	SSA	South Asia	
Travel	0	0	0	14	0	28	0	42
Trade	0	0	0	57	0	45	0	102
Military	0	0	0	18	0	23	0	41
Inter-state War	0	0	12	29	24	1	0	66
Financial	0	2	0	73	14	53	0	142
Diplomatic	0	1	0	20	5	0	0	26
Arms	0	0	0	17	0	24	0	41
Total	0	3	12	228	43	174	0	460

Sources: GSDB, TIES, UCDP

Empirical Analysis

Model

The basic gravity model relates bilateral trade T_{ijt} to the GDP of the involved countries, distance D_{ij} between these countries and other explanatory variables X_{ijt}. depending on the

purpose of the analysis. Our specification can be summarized as follows:

$$T_{ijt} = \text{f}(GDP_{it}, GDP_{jt}, D_{ij}, \text{Interstates war } s_{ijt}, \text{Sanction } s_{ijt}, \text{Trade policy}_{it}, \text{Democracy}_{it}) \quad (1)$$

Gravity models have proved successful in predicting the patterns of bilateral trade and assessing the effects of commercial and monetary policies. First introduced by Linnemann (1966), they can be derived as a reduced form of a broad class of structural economic models (see Anderson, 1979 and Bergstrand, 1989). In all cases, the resulting empirical specification is a double-log relationship between bilateral flows and national incomes, distance andther explanatory variables. The coefficients can, therefore, be interpreted as elasticities.

Estimation based on the application of the OLS method to a log-linear expression of Equation 1 was once the common approach. However, Silva and Tenreyro (2006) criticize the OLS estimation of the log linear equation on two grounds: (i) in the presence of heteroscedastic errors, the variance of estimates is biased, and (ii) the log linear transformation of zero trade observations is not possible. Hence, the double-log specification omits country pairs for which the reported value of bilateral trade is zero. This does not greatly impact the interpretation of results when trade between developed countries is considered (Feenstra et al., 2001) because there are almost no zero values. In contrast, it is undesirable when trade with developing countries is considered as there is, in general, a non-negligible number of zeros. These observations help to explain why low levels of trade are sometimes observed. Moreover, trade flows of zero are rarely randomly distributed. Hence, truncating these observations can lead to biased results. Given the number of observations of trade flows of zero in my sample (around 25% of the total), the issue is important, and I will explore possible solutions.

Rather than dropping trade observations of zero, some authors estimate the model by adding a small number to the zero observation and using a double log OLS. Others uses the Tobit estimator on a semi-log specification. However, adding a small positive value to trade flows has no theoretical justification and can distort estimated results (Flowerdew and Aitkin, 1982). An alternative approach to addressing the issue of observations of trade flows of zero is to use a sample selection model, such as Heckman's, that applies a selection bias method. Anderson and van Wincoop (2003) suggest that the gravity model can be estimated by nonlinear or linear OLS with fixed effects.

In all cases, Silva and Tenreyro (2006) still warn that the OLS estimation will not yield consistent estimates. They suggest the use of the Poisson family of regressions—in particular, they use the Poisson Pseudo Maximum Likelihood (PPML)—to eliminate the issue of trade flows of zero. The gravity equation is estimated multiplicatively without introducing the log linear transformation. The PPML model, which can address trade flows of zero, consists of two parts. The first part is a Logit (Probit) equation modeling the probability of bilateral trade flows of zero. The second part takes bilateral trade flows, including trade values of zero as count data, and estimates a Poisson model. The probability mass functions of the first and second parts are, respectively:

$$Pr(T_{ijt}) = \exp^{-\mu} \ \ \text{if} \ T_{ijt} = 0 \qquad\qquad (2)$$

$$Pr(T_{ijt}) = \frac{exp^{-\mu} \mu^{t_{ijt}}}{T_{ijt\,!}} \ \ \text{if} \ T_{ijt} > 0 \qquad\qquad (3)$$

where

$$\mu_{ijt} = Y_{ijt}^* - \log(GDP_{it}) - \log(GDP_{ijt}) - \log(Dist_{ij}) - X_{ijt}$$

d Y^* is a latent variable demonstrating whether there is trade between i and j.

Results

A four-steps analysis produces my results. First, I estimate the basic model comprised of Equations 1 to 3 using the PPML method. In addition to the traditional gravity variables—Log (GDP importer), the Log (GDP exporter) and the Log (Distance)—I introduce different dummies for wars and for each broad category of sanctions. The dummies equal 1 for the partners and the period during which an event takes place and zero otherwise. The broad categories of sanctions considered include the suspension of financial or military collaboration, restraints to travel between countries, commercial sanctions and diplomatic sanctions. The aim is to disentangle which types of events adversely affect bilateral trade.

Second, I take advantage of the fact that sanctions are split by "sub-sanctions" to re-estimate the specification using the "sub-sanctions" instead of their heading category. The objective is to be more precise in testing which event affects trade. Third, using the specifications that include the events having significant coefficients, I add other control variables to check the robustness of the findings. I group the additional control variables in three categories: trade policy indicators (PTAs and, GATT/WTO members), geographical/ historical indicators (Colonial link, similar language, contiguity and, oil exporters) and polity indicators (Scores of democracy, a dummy for internal conflict and a dummy for neutral states). Except for internal conflict and neutral states, the motivation for introducing these control variables is discussed in Martin et al. (2008). The reason for introducing internal conflict is based on Blomberg and Hess (2006), while the introduction of the neutral state dummy is based on Glick and Taylor (2010). The neutral state dummy equals 1 for country i which is not involved in a war or a sanction in time t, while its partner j is involved against a third country. Fourth, in line with previous literature, I examine the timing of the effects of each event. In particular, I examine the number of years between the year when an event takes place and the year when the first effect on bilateral trade shows up. Similarly, I compute the number of years since the event's ending and the first year trade recovers.

Table 4 gives the results of the first step. For illustration, I present the results for each of the 3 methods of estimation discussed above (OLS, Tobit and PPML). Among the traditional gravity variables, the coefficient of the exporter's GDP and distance are significant and respectively positive and negative. Both of these are the expected sign.

Their significance and the direction of the sign holds true irrespective of the estimation method. The coefficient of importing country's GDP is significant with un unexpected negative sign with OLS and Tobit but insignificant with PPML.

Among the conflict variables, the significances and the signs differ greatly. The coefficients of financial collaboration and diplomatic sanctions are never significant. The coefficients of financial collaboration, military collaboration, travel freedom and diplomatic sanctions are insignificant irrespective of the estimation method. The coefficients of commercial sanctions and inter-state wars are significant and as expected with all the three estimation methods. It is worth noting that coefficients are always higher in absolute term with OLS and Tobit than with PPML. Given the above discussion of the estimation methods and the present results, which make sense, I will consider only the results of PPML method in what follows.

Table 4. Basic model estimation results

	OLS	Tobit	PPML
Dependent Variable	Log (Trade + 1)	Log (Trade + 1)	Trade
Explanatory Variables			
Log (GDP $_{importer}$)	-0.074**	-0.105**	-0.008
	(2.345)	(2.225)	(1.457)
Log (GDP $_{exporter}$)	0.788***	1.154***	0.114***
	(22.328)	(21.192)	(17.893)
Log (Distance)	-0.298***	-0.469***	-0.062***
	(2.849)	(3.034)	(3.385)
Financial Collaboration	0.303	0.452	0.080
	(0.216)	(0.205)	(0.279)
Military Collaboration	0.578	1.149	0.203
	(0.316)	(0.389)	(0.551)
Travel Freedom	-0.924	-1.659	-0.259
	(0.283)	(0.361)	(0.453)
Commercial Sanctions	-3.745**	-5.956**	-0.637**
	(2.249)	(2.491)	(2.466)
Diplomatic Sanctions	2.240	4.600	0.738
	(0.813)	(0.968)	(1.303)
Inter-state Wars	-3.693***	-5.94***	-0.634***
	(2.587)	(2.832)	(2.783)
Number of observations	26365	26365	26365
Adjusted R-squared	0.02		
P-value; F (zero slopes = 0)	0.00	0.00	
Fraction of positive observations		0.67	

t-statistics are in parentheses ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 5 presents the second step of the analysis, which consists of splitting sanctions by sub-components. I disregard those sanction categories having insignificant coefficients with PPML in Table 4. Moreover, the GSDB data bank splits commercial sanctions into 14 different sub-components. Among these, only two have been implemented in the countries of interest during the period in the sample: total economic embargo and import restriction. The results using each of the components are presented in a different column. The results of the regression with significant coefficients in Specifications 1 and 2 are presented in the third columns.

The coefficients of the traditional gravity variables are very similar to those in Table 4. Among the components of commercial sanctions, only import restriction has a significantly negative coefficient in Specification 3. Inter-state wars always exhibit a significantly negative coefficient. Interestingly, the coefficient of import restriction is higher than the one of war. A pacific implication of this result is that, import restriction might be a "cheaper" means to achieve an objective than war. In particular, the harm to bilateral trade is higher, but the cost in terms of human life and infrastructure destruction is avoided. A vehement implication is that combining import restrictions and inter-state war imposes higher costs on the sanctioned country and, therefore, is more effective.

At the end of this second step, the preferred speciation includes two hostile engagements (inter-state wars and import restriction), both of which effectively impact trade. Our next step of the analysis is to see whether these results are robust to the introduction of additional variables.

Table 5. Determining effective type of commercial sanctions (PPML)

Specification	1	2	3
Explanatory variables			
Log (GDP $_{importer}$)	-0.008	-0.008	-0.008
	(1.439)	(1.412)	(1.396)
Log (GDP $_{exporter}$)	0.114***	0.114***	0.114***
	(17.87)	(17.91)	(17.9)
Log (Distance)	-0.061***	-0.06***	-0.06***
	(3.344)	(3.302)	(3.272)
Total Economic Embargo	0.472***		-0.258
	(2.093)		(0.681)
Import Restriction		-1.951***	-2.209***
		(3.702)	(3.405)
Inter-state Wars	-0.635***	-0.635***	-0.635***
	(2.785)	(2.789)	(2.786)
Number of observations	26365	26365	26365

t-statistics are in parentheses ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

Table 6 shows the results of the third step of the analysis. It consists of Specification 3 from Table 5, without total economic embargo because it is non-significant, plus additional control variables. I group the additional variables into three categories: trade policy

(Preferential Trade Arrangements and GATT/WTO members), geographical/historical (Colonial Link, Similar Language, Contiguity and Oil Exporters) and polity indicators (Democracy Score of exporter, Effect of Sanctions on Neutrals, Effect of Wars on Neutrals and Internal Conflict). All the additional variables are dummies except democracy scores. In Table 6, the results with each group of additional variables are presented in a different column. The results of the regression with significant coefficients in Specifications 1 to 3 are presented in the fourth columns.

The coefficients of the traditional gravity variables are broadly similar to above. The previous results regarding the coefficient of inter-state wars and import restrictions still hold. Democracy in the exporting country has a positive and significant coefficient, meaning that more democratic MENA countries export more. Countries with similar languages trade more. An interesting result is that the coefficient of the effect on neutral countries is positive and significant. Bilateral trade with neutral countries increases in war time. Export of oil producers is higher. The coefficients of the trade policy indicators are non-significant.

Table 6.   Additional explanatory variables (PPML)

Specification	1	2	3	4
Explanatory variables				
Log (GDP $_{importer}$)	-0.011*	-0.004	-0.016***	-0.009
	(1.937)	(0.648)	(2.689)	(1.444)
Log (GDP $_{exporter}$)	0.120***	0.108***	0.078***	0.127***
	(18.19)	(16.899)	(10.063)	(18.174)
Log (Distance)	-0.060***	-0.058***	-0.033*	-0.048***
	(3.311)	(2.957)	(1.760)	(2.595)
Import Restrictions	-1.920***	-1.904***	-1.713***	-1.784***
	(3.646)	(3.588)	(3.301)	(3.44)
Inter-state Wars	-0.591***	-0.516***	-0.515*	-0.429*
	(2.589)	(2.223)	(1.811)	(1.794)
Preferential Trade Arrangements	0.008			
	(0.038)			
GATT/WTO members	0.068***			0.023
	(3.768)			(1.175)
Colonial Link		-0.053		
		(0.675)		
Similar Language		0.226***		0.222***
		(10.120)		(9.786)
Contiguity		-0.071		
		(1.316)		
Oil Exporters		0.295***		0.313***
		(9.211)		(9.385)
Democracy Score $_{exporter}$			0.032***	0.393***
			(17.852)	(19.274)

(*Contd.*)

Specification	1	2	3	4
Effect of Sanctions on Neutrals			0.074*** (4.303)	0.075*** (4.422)
Effect of Wars on Neutrals			0.066*** (3.772)	0.039*** (2.219)
Internal Conflict			-0.043*** (10.783)	-0.036*** (8.654)
Number of observations	24985	24985	24985	24985

t-statistics are in parentheses ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.

I retain only the variables with significant coefficients in specification 4 as the preferred specification. Table 6 uses this specification to address two questions frequently investigated in the literature. One concerns the number of years after the initiation of conflicts for bilateral trade to start declining. The other looks at the number of years after the end of conflicts for bilateral trade to resume. Because of the time dimension of the sample, I consider only the first, second and third years separately and pool together observations from the fourth year and beyond. The first column of Table 7 gives only the results for the years after the start of hostility, the second column examines only the years after the end of hostility, and the third column provides the estimation results of the specification incorporating only the years after the start and those after the end which were significant in either Specification 1 or 2. For space, the Table focuses only on these coefficients. After the start of a war, the adverse effect on bilateral trade appears only from the fourth year on. Interestingly, the effect of import restrictions appears as quickly as in the first year of the imposition, with the coefficient negative and of high magnitude (in absolute terms). Turning to the post-hostility coefficients, none is significant.

Table 7.   Timing of the effects (PPML)

First year of war	-0.034 (0.054)		- -
Second year of war	0.045 (0.050)		- -
Third year of war	0.000 (0.000)		- -
After the third year of war	-0.943** (2.386)		-0.938** (2.374)
First year of import restrictions	-1.303** (2.173)		-1.297** (2.164)
Second year of import restrictions	0.000 (0.000)		- -
Third year of import restrictions	0.000 (0.000)		- -
After the third year of import restrictions	0.000 (0.000)		- -
First year war end		0.000 (0.000)	- -

Second year war end	0.317	-
	(0.509)	-
Third year war end	1.042	-
	(1.285)	-
After the third year war end	0.456	-
	(1.605)	-
First year import restrictions end	0.000	-
	(0.000)	-
Second year import restrictions end	0.000	-
	(0.000)	-
Third year import restrictions end	2.068***	0.393
	(2.886)	(0.795)
After the year after import restrictions end	1.676***	0.000
	(3.220)	(0.000)

t-statistics are in parentheses ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively.
"-" means that year is not included in Specification 3 because the corresponding coefficient is insignificant in either Specification 1 or 2.

Conclusion and discussion

This paper investigates the impact of armed and non-armed conflicts on exports from the MENA region. I focus on the MENA because political tensions and low integration in World (non-oil) exports are two major features. Other idiosyncrasies of the region (oil exporter abundance, countries of vastly different wealth, a shared religion with differing practices and a complex relationship with Israel)) offer a unique opportunity to test whether previous literature findings are universal or dependent on the time and place, as argued by Mansfield and Pollins (2001).

The descriptive analysis confirms that the share of bilateral exports in total exports is the lowest compared to other regions of the world. The same observation holds for the democracy score. Trade policy differs across countries of the region. In terms of sanctions and inter-state wars, more than half that occur in the MENA region take place *between* MENA countries.

In line with findings in the literature, the econometric tests show that commercial sanctions and inter-state wars are harmful to the region's bilateral exports (Keshk et al., 2004 and Heilmann, 2016). Our results don't confirm Barbieri and Levy (1999)'s findings that war has no impact on trade. Regarding commercial sanctions, import restriction is the only effective in reducing trade. Its effect on bilateral trade is higher than the one of war. The adverse effect of inter-state war on bilateral exports appears four years after the start of the war. The effect of import restriction appears as quickly as in the first year of the imposition of the sanction. Import restriction being more effective than war to achieve the sanctioning objective and its effect being quicker to manifest, it can be seen as preferable to war especially that the costs in terms of human life and infrastructure destruction are avoided. Of course, an alternative implication of my findings is that combining import restriction and war imposes higher costs on the sanctioned and, therefore, can be more effective.

Adding other control variables, I find that, unsurprisingly, oil abundant countries export more and that internal political tensions have a negative effect on exports. Blomberg and Hess (2006) also show that the cost of internal conflict is as high as the cost of a 30% percent increase in trade barriers. The level of democracy in the exporting countries is, like in Mansfield et al. (2008), associated with more trade. This effect of democracy complements the findings in the literature that shows that democracy helps reducing political tensions. Another interesting result is that the effect of conflicts involving MENA countries on neutral countries is positive and significant. Bilateral trade between MENA and neutral countries increases in war time. This connects to Ahn and Ludema (2020), which shows that politicians engage in shifting the burden of the sanction from the target firms to its government. It is also in accordance with Haidar (2017), who finds that two-thirds of the value of Iranian exports thought to be destroyed by U.S. sanctions have actually been redirected to non-sanctioning countries.

Although it is not the main purpose of our investigation, the lack of democracy in the MENA deserves being emphasized. Our paper points to low democracy scores in the Region as a source of its low bilateral trade. Weak bilateral trade is found by other authors to lead to high likelihood of conflicts in the MENA. Hence, the Region seems to witness a vicious circle originating from the democracy deficit. The latter limits bilateral trade and, as consequence, increases the likelihood of conflicts. Conflicts being harmful to trade, the probability of further conflicts is higher.

Appendix A

Table A.1.   List of countries

Algeria	Guinea	Norway
Angola	Honduras	Oman
Argentina	Hong Kong	Pakistan
Australia	Hungary	Panama
Austria	India	Paraguay
Azerbaijan	Indonesia	Peru**anctions**
Bahrain	Iran	Philippines
Bangladesh	Iraq	Poland
Belarus	Ireland	Portugal
Belgium	Israel	Romania
Benin	Italy	Russia
Bolivia	Jamaica	Rwanda
Botswana	Japan	Saudi Arabia
Brazil	Jordan	Senegal
Bulgaria	Kazakhstan	Sierra Leone
Burkina Faso	Kenya	Singapore
Burundi	Korea Democratic	Slovakia
Cambodia	Korea	Slovenia
Canada	Kuwait	Somalia
Central Africa	Kyrgyzstan	South Africa
Chad	Laos	Spain
Chile	Latvia	Sri Lanka
China	Lebanon	Sweden
Colombia	Lesotho	Switzerland
Congo	Liberia	Syria
Congo Democratic	Libya	Taiwan
Côte d'Ivoire	Lithuania	Tajikistan
Cuba	Macedonia	Tanzania
Czech	Madagascar	Thailand
Denmark	Malawi	Togo
Dominican	Malaysia	Tunisia
Ecuador	Mali	Turkey
Egypt	Mauritania	Turkmenistan
El Salvador	Mexico	Uganda
Estonia	Moldova	Ukraine
Ethiopia	Mongolia	United Arab Emirates
Finland	Morocco	United Kingdom
France	Mozambique	United States
Gabon	Myanmar	Uruguay
Georgia	Nepal	Uzbekistan
Germany	Netherlands	Viet Nam
Ghana	New Zealand	Yemen
Greece	Niger	Zambia
Guatemala	Nigeria	Zimbabwe

Table A.2.   Descriptive statistics

	Mean	Std. Dev	Minimum	Maximum
Log (GDP $_{importer}$)	23.27	2.38	7.59	30.00
Log (GDP $_{exporter}$)	23.68	1.47	18.01	26.99
Log (distance)	8.43	0.73	4.74	9.87
Democracy	-4.88	5.66	-10.00	9.00

Table A.: Correlation

	Log (GDPD $_{importer}$)	Log (GDP $_{exporter}$)	Log (distance)	Democracy
Log (GDP $_{importer}$)	1.00			
Log (GDP $_{exporter}$)	0.24	1.00		
Log (distance)	0.02	-0.03	1.00	
Democracy	0.08	0.31	-0.06	1.00

Appendix B: Economic and Diplomatic Sanctions

The types of economic sanctions are:
- Total Economic Embargo
- Partial Economic Embargo
- Import Restriction
- Export Restriction
- Blockade
- Asset Freeze
- Termination of Foreign Aid
- Travel Ban
- Suspension of Economic Agreement

The types of diplomatic sanctions are:
- Expulsion of Ambassador
- Recall of Ambassador
- Temporary Closing of Embassies
- Ending Diplomatic Contact

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