

War and Third-party Trade

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Journal of Conflict Resolution
2018, Vol. 62(1) 119-142
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DOI: 10.1177/0022002716644329
journals.sagepub.com/home/jcr



Abstract

Few studies explain how wars affect trade with third parties. We argue that wartime trade policies should raise trade with friendly and enemy-hostile third parties but reduce trade with hostile and enemy-friendly third parties. At the same time, the private motivation of firms and households may be incompatible with national wartime trade policies and constrain the effectiveness of wartime trade policies. Our directed dyadic data set consists of almost all of the states from 1885 to 2000. Running a high definition fixed effects regression with two-way clustering of standard errors, we find that hostile third parties tended to reduce trade with a combatant state by roughly 30 percent. In addition, trade with third parties friendly to the enemy fell by a similar magnitude. In contrast, on average, war hardly affected trade with third parties because of substitution of war-ridden markets with third-party business partners.

Keywords

trade, political economy, militarized interstate disputes, interstate conflict

The rapid growth in international trade and investments that took place since the end of the Second World War has inspired hopes for a more peaceful world. Such hopes were mainly based on the proposition that interdependent states have ever more to lose by initiating hostilities against each other because war disrupts trade. Serious

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quantitative research of this proposition started to develop after Polachek's (1980) seminal work.¹ Many studies have shown that bilateral trade reduces the likelihood of militarized interstate disputes (MIDs), (Hegre 2004; Hegre, Oneal, and Russett 2010; Mansfield 1994; Oneal and Ray 1997; Oneal and Russett 1997, 1999; Russett and Oneal 2001; Weede 1995; Xiang, Xu, and Keteku 2007).² A related literature argues that it is capitalism that induces peace, by promoting investments, economic development, and financial and monetary integration (Gartzke 2007; McDonald 2009; Mousseau 2013). Gartzke and Li (2003a) and Russett and Oneal (2001) found that trade openness in general as well as bilateral trade reduces the tendency to be engaged in MID. Souva and Prins (2006) arrived at similar conclusions with particular regard to fatal MID.

The "costly signals" literature argues that trade and financial openness discourages war, not because of opportunity cost but because it improves communication between potential combatants. Openness allows decision makers with incomplete information about the resolve of the opponents to signal their willingness to incur economic costs (Gartzke, Li, and Boehmer 2001; and Gartzke and Li 2003b).³

More recently, the social network analysis literature analyzes how indirect trade via third parties reduces the likelihood of MIDs between dyad of states, perhaps by allowing mediation by a third party (Dorussen and Ward 2010; Kinne 2012; Maoz 2009; Poast 2010). Lupu and Tragg (2013) argue that countries in the same trading community (as identified by the community detection tool of network analysis) are less likely to go to war with one another. However, Böhmelt (2010) finds the opposite: trade links to third parties actually reduce the likelihood of mediation.

While most of the literature explains the likelihood of MID or outright wars and their effects on trade between combatants, few studies explain how wars affect trade with third parties. The few that do tend to refer to all third parties, as if they were a single player with uniform sensitivity to the conflict. This approach does not address the different national interests of third parties and the separate effect that war may have on business-driven trade with third parties.

This study contributes to the literature by arguing that trade between a combatant state and a noncombatant state increases (falls) when they have similar (opposing) interests but decreases (rises) when the noncombatant state has similar (opposing) interests with the enemy. In other words, trade rises with friendly and enemy-hostile third parties but falls with hostile and enemy-friendly third parties.

At the same time, the private profit motivation of firms and the benefits to households from trading with counterparts in noncombatant states may not be compatible with national wartime trade policies. In cases of such misalignment of motivation, trade with third parties may adversely affect the effectiveness of wartime trade policies. Firms and households may not necessarily be inclined to act as foreign policy tools of governments and may attempt to evade government policy.

The third section sets out the research design. We innovate with a directed dyadic data set of almost 860,000 observations, which consists almost all of the states from

1885 to 2000. This data set improves the external validity of the findings (smaller data sets reflect the effects of specific wars), avoids selection bias (which occurs when only part of the available data is used), and enables better controls for omitted variables (by distinguishing export flows from import flows) in accordance with new methods developed in the field of trade economics in recent years. In the fourth section, we use this data set to test our hypotheses and support our argument with high definition fixed effects regressions applied to a gravity model and discuss the results. To the best of our knowledge, this is the first analysis of the impact of conflict on trade that uses two-way clustering to address the interdependence between dyadic trade observations. The fifth section provides conclusions.

National Interests and the Cost of War

Wars and lower forms of MIDs between states often involve partial or full trade embargoes and boycotts. On top of government actions, MIDs, especially outright wars, raise the costs to private agents of engaging in trade with agents from a belligerent state. Risk premiums increase, and the violence, destruction, and regulations burden logistics. Nationalistic chauvinism distorts household and business decisions.

This is empirically documented by a vast literature, which with some exceptions mostly found that trade flows between combatant or otherwise adversarial states fall significantly, as bilateral political relations deteriorate.⁴ In contrast, the effect of MIDs on trade with third parties has been the subject of fewer empirical studies. Glick and Taylor (2010); Hegre, Oneal, and Russett (2010); and Long (2008) found that MIDs impede trade with third parties in addition to the decline in trade between the adversarial states. Their findings contrast with those of Martin, Mayer, and Thoenig (2008) who found that MIDs have very marginal effects on third parties. Gowa and Hicks (2015) found that during the First World War, trade with third parties, be they neutrals or allies, actually increased.

Wartime trade policies aside (see discussion below) wars reduce business-driven trade between corporations in combatant states with corporations in third parties. Within combatant states, the sectors that are not essential to the war effort tend to contract because of either physical destruction to their production capacity or reallocation of resources to the production of war essentials. In addition, the purchasing power of households in combatant states and their demand for nonwar consumption and investment products tend to decline. Thus, the decline in trade with third parties reflects in part the shrinking economic activity of firms and households in the private sector of the combatant state. Of course, some firms in war-related sectors may expand, but we regard any trade effect this would have as part of the political interests-driven trade. On top of this, combatant states may impose blockades that disrupt each other's trade with third parties. Finally, as Lupu and Tragg (2013) argue, trade often creates communities in which dyads have many trade partners in common. Conflict between any dyad in the community is likely to damage trade

with many community members, magnifying the conflict's opportunity cost even if without significant intercombatant trade.

However, there are factors that stimulate trade with third parties. First, if trade falls because the private sectors of the combatant states are depressed, then it is likely that it should fall proportionally less between one depressed (combatant) economy and one nondepressed (noncombatant) economy than between two depressed (combatant) economies. In other words, firms and households in a combatant state can rely to some extent on the better business environment in noncombatant states.

Second, wars can actually increase trade with some third parties, which provide substitute export markets and import sources to those lost among the warring states as well as substitute for lost domestic production capacity or decline in nonwar sectors. For example, see the increase in trade of combatant states with Denmark, Norway, Sweden, and the Netherlands during the First World War (Gowa and Hicks 2015), as well as with the United States as a third party, before it entered the war. Indeed, British exports and reexports to Sweden, Norway, and the Netherlands tripled in 1914. Danish shipments increased nine times over (Osborne 2004, 93).

Third, *ceteris paribus*, war should jeopardize international transportation (on which international trade is dependent) especially when the transportation routes run close to the theatre of war. Mines, stray projectiles, and mistakes in identification create a dangerous environment. To the extent that wars are fought at or adjacent to at least one of the combatant states, they are likely to disrupt transportation between combatants more than between them and third parties. For example, during the Tanker War, as part of the Iran–Iraq war in the 1980s, mines or missiles mistakenly hit some third-party vessels in the Gulf (Cordesman and Wagner 1990).

Finally, trade with third parties does not suffer from the same degree (if any) of animosity and chauvinism, which increase transaction costs of otherwise mutually beneficial trade between firms and households from opposing combatant states. For example, during the tension between China and Japan over the Diaoyu/Senkaku islands in 2012, Chinese protesters rioted for several weeks damaging Japanese-made cars, vandalizing stores selling Japanese products, and setting a Panasonic factory on fire. Some Chinese state media outlets listed Japanese brands to boycott (Katz 2013). For all of these reasons, we expect that trade between combatants and noncombatants should on average fall by a lower proportion than trade between the warring states.⁵

In addition to these effects, some trade is lost, and some gained due to third parties' wartime trade policies, which they pursue in accordance with their national interests. In general, we can expect that a third party *C* with relatively similar national interests to those of a combatant state *A* will try to assist *A* in times of peace and especially in times of war, by increasing its trade with *A* and restricting its trade with *A*'s enemy—state *B* (Figure 1). Likewise we can expect that *A* will do what it can to increase trade with *C* and possibly that *B* may also take measures to reduce its trade with *C*. Conversely, dissimilar national interests between *C* and *A* are

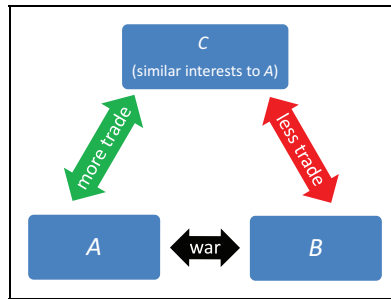


Figure 1. The effect of similarity of national interests on trade.

expected to reduce their bilateral trade and increase C – B trade. Of course, any similarity of interests between B and C would similarly motivate an expansion in B – C trade and a decline in A – C trade (to see this, simply switch the A and B cells in Figure 1). This means that the trade of each combatant state A with a third party C is expected to rise in relation to the degree of similarity of interests between them (or fall as their interests become less similar). Conversely, trade between A and C is expected to fall in relation to the degree of similarity of interests between B and C (or rise as their interests become less similar). We can summarize this discussion with the following two hypotheses:

Hypothesis 1: When a state is at war, the greater is the similarity of national interests between it and a third party, the more it will trade with that third party.

Hypothesis 2: When a state is at war, the greater is the similarity of national interests between its enemy and a third party, the less it will trade with that third party.

States can restrict their trade with each other by way of formal government actions consisting mainly of embargos, boycotts, tariff increases, and the imposition of a wide variety of nontariff barriers (NTBs; Lektzian and Sprecher 2007; Whang, McLean, and Kuberski 2013). Informal actions by the state’s bureaucracy are also possible, mainly by imposing undeclared NTBs. Such special treatment can take the form of extended time for processing applications for permits or for clearing customs, unusually thorough inspections of traded goods, unusually comprehensive tax auditing, and stricter enforcement of laws in general.

Indirect obstruction of trade is also possible by firms, investors, trade unions, and consumers. These reactions can be spontaneous if people share the government’s approach to the conflict, or if firms and households avoid trade with the target state in expectation of government action, even if such action fails to materialize. In doing so, they may be responding to government signals about the (un)desirability of trade

with the target state. Sometimes public opinion actually leads policy, and the government is pushed to impose sanctions on a disliked state (Whang 2011).

Conversely, states can increase their trade with each other (at least between various agencies and state-owned enterprises of the two states) by way of formal, informal, and indirect action too, by taking the reverse direction on all of the actions described above (Peterson and Drury 2011). Indeed, Gowa (1994), Gowa and Hicks (2013 and 2015), Gowa and Mansfield (1993), and Mansfield and Pevehouse (2000) argue that national security interests influence commercial ties and find that alliances promote trade.

However, the private profit motivation of firms and the benefits to households from trading with counterparts in noncombatant states may not be compatible with national wartime trade policies. In cases of such misalignment of motivation, trade with third parties may adversely affect the effectiveness of wartime trade policies. Firms and households may not necessarily be inclined to act as foreign policy tools of governments and may attempt to evade government policy.

Research Design

Our directed dyadic data set covers 116 years (1885–2000) in annual frequency and 191 different countries and territories, for which trade data are available (up to 183 countries in any given year). We exclude the post-2000 years for lack of consistent data on similarity of national interests.

The dependent variable is the log of annual nominal USD merchandise exports from one state to another, taken from the Correlates of War (COW) 2.0 database (Barbieri, Keshk, and Pollins 2008). In order to allow the logarithmic transformation of trade flows, we code observations with zero trade as having a value of US\$1,000, which is the minimum value recorded in international trade.⁶

Thus, for every pair of states, the trade flow in each direction forms a separate observation. Distinguishing exports from imports of a given country is necessary for the method that we use to control for omitted variables (see below). As a result, there are 857,435 trade observations. This data set improves the external validity of the findings (smaller data sets reflect the effects of specific wars) and avoids selection bias (which occurs when only part of the available data is used).

As in most studies on the effect of war on trade, the hypotheses are tested with a gravity equation, which explains trade as driven by the importing nation's demand variables (its gross domestic product [GDP] and consumer price index), the exporting nation's supply potential (its GDP and market access factor), but hampered by transaction costs (including bilateral distance and price markups).⁷

Measurement, data availability, and instrumentation problems lead many empirical studies to omit such important variables (as well as domestic and international political variables). Baier and Bergstrand (2007), Baldwin and Taglioni (2006), Baldwin *et al.* (2008, 39-42), Gowa and Hicks (2013 and 2015), and Sadeh (2014) control for such variables with exporter-year fixed effects (EYFE),

importer-year fixed effects (IYFE), and country-pair fixed effects (CPFE). We accept that this method is least likely to produce biased estimates. By greatly reducing the scope for omitted variables, it is also a very powerful method in minimizing endogeneity of variables (Baier and Bergstrand 2007, 77-79). We discuss the potential for remaining endogeneity below.

We run a high definition fixed effects regression absorbing three categorical variables: a pair identifier, an exporter-year identifier, and an importer-year identifier (to control for the CPFE, EYFE, and IYFE, respectively).⁸ These identifiers control for any country-year variable, including GDP and population, and thus obviate the need to specify them in the regression.⁹ Robust standard errors are two-way clustered: at the year level, in order to address possible interdependence between dyadic trade observations in a given year, and at the country-pair level, in order to address potential problems of heteroscedasticity and autocorrelation in the error terms (for a more detailed explanation, see De Benedictis and Taglioni 2011; Glick and Taylor 2010, f. 23).¹⁰

We next specify an array of dummy variables controlling for the effects of trade clubs and currency blocks; these include dummy variables for pairs of two World Trade Organization (WTO)/General Agreement on Tariffs and Trade (GATT) member states, two member states of a common Preferential Trade Agreement (PTA), and two member states of a common currency block (CURRENCY). To each of these three dummies, two more dummies are added, coding for a member of the club/block exporting to a nonmember of the same club/block (noted with the suffix EX), and a club/block member importing from a nonmember of the same club/block (noted with the suffix IM).¹¹

WAR is a dummy variable scoring in each observation 1 for a war between the particular pair of states in the particular year. This coding is based on the interstate war list taken from the COW database, which defines war as involving sustained combat by organized armed forces, resulting in a minimum 1,000 battle-related combatant fatalities within a twelve-month period (Ghosn and Bennett, 2003). Since only states that committed at least 1,000 troops and suffered at least one battle-related death are considered as war participants, there are 570 observations with $WAR = 1$. The coefficient of WAR is expected to be negative. Since WAR and trade are simultaneous variables, this coefficient is of course merely a measure of association.

WAR3 is a dummy variable scoring in each observation 1 if one of the states in the particular pair was at war with a state from another pair in that particular year. There are 66,975 observations in the data set with $WAR3 = 1$. The coefficient of WAR3 is expected to be negative but with a smaller magnitude than the coefficient of WAR. Simultaneity between WAR3 and trade should be weak, because trade with the overwhelming majority of third parties would have only negligible effect on the likelihood of war with another state. Nevertheless, we regard the coefficient of WAR3 as a measure of association, controlling for third-party trade effects.

FRIEND is an index of similarity of national interests between the two states in each observation; to control for the effect, this may routinely have on bilateral trade.

We expect the coefficient of FRIEND to be positive. We use Signorino and Ritter's (1999) S index of similarity of the two states' portfolios of alliances as a proxy for the similarity in their national interests based on the data in EUGene (Bennett and Stam, 2000; Signorino and Ritter, 1999). This index ranges from -1 (perfect dissimilarity of policy portfolios) to 1 (perfect similarity). Two different variants of the index are used, both weighing alliances according to the allies' military capabilities, but one of them considers only regional alliances (S Weighted Regional in EUGene) and the other considers all alliances (S Weighted Global).

We regard both variants of FRIEND as exogenous to WAR and trade. Indeed, the Pearson correlation coefficients (r) of WAR with S Weighted Regional and S Weighted Global in our data set are $-.0008$ and $-.0111$, respectively.¹² We also regard trade as reflecting security interests rather than causing them. Even if states form some alliances in order to protect trade, note that our measures are based on similarity of alliances within each dyad not necessarily any actual alliance between the two states.

We interact WAR3 and FRIEND in order to capture the effect of trade-stimulating wartime policies resulting from the similarity of interests between one of the states, which is at war (state A in Figure 1), and the other, which is not (C). Hypothesis 1 is supported if the coefficient of the interaction $WAR3 \times FRIEND$ is positive.

ENEMY_FRIEND is an index of the similarity of national interests (with the same two variants) between one noncombatant state in the pair (C) and a combatant state (B) that is at war with the other (combatant) state in the pair (A). Thus, in contrast to $WAR3 \times FRIEND$, the coefficient of ENEMY_FRIEND captures the trade-obstructing wartime policies resulting from the similarity of interests between states B and C on $A-C$ trade. For example, in 1982, the United Kingdom was at war with Argentina; in the observation of trade between the United States (state C) and Argentina (state A) in 1982, ENEMY_FRIEND represents the similarity of national interests between the United States and the United Kingdom (state B).

In an observation in which A was at war with more than one state, the value of ENEMY_FRIEND is an average of the similarity values of state C vis-à-vis all of A 's enemy states. If states A and C were each simultaneously engaged at war but not with each other, ENEMY_FRIEND is the average of the two different similarity values calculated for each state in the pair (between its enemies and the other state in the pair). In all observations in which both states are at war with each other ($WAR = 1$) or without any state at war ($WAR3 = 0$), $ENEMY_FRIEND = 0$. Hypothesis 2 is supported if the coefficient of ENEMY_FRIEND is negative.

Results

In Table 1, regression (1) is a basic gravity specification. In regression (2), WAR and WAR3 are added. As expected trade has been significantly lower between warring states (by $\exp[-1.01] - 1 = 64$ percent on average) during the study period.

Table 1. Trade, War, and National Interests 1885 to 2000.

Operational Variant of the Index of Similarity of Interests	(1)	(2)	(3)	(4)
			Regional Alliances Only	All Alliances
WAR—Dummy for two warring states		−1.01*** (0.33)	−1.02*** (0.32)	−1.05*** (0.32)
WAR3—Dummy for a state at war trading with a state not at war with it		−0.26** (0.12)	−0.21* (0.12)	−0.15 (0.14)
FRIEND—Similarity of interests between the two trade partners			0.14*** (0.04)	0.09 (0.08)
WAR3 × FRIEND—Wartime similarity of interests between the two trade partners			0.22*** (0.06)	0.28*** (0.09)
Marginal effect of FRIEND on dependent variable when WAR3 = 1			0.35*** (0.07)	0.38*** (0.12)
ENEMY_FRIEND—Similarity of interests between a third party and the war enemies of its trade partner			−0.29*** (0.06)	−0.45*** (0.09)
WTO—Dummy for pairs of two WTO member states	−.03 (.07)	−0.03 (0.07)	−0.03 (0.07)	−0.03 (0.07)
WTOEX—Dummy for WTO member exporting to WTO nonmember	.02 (.05)	0.02 (0.05)	0.02 (0.05)	0.02 (0.05)
WTOIM—Dummy for WTO member importing from WTO nonmember	−.07 (.05)	−0.07 (0.05)	−0.07 (0.05)	−0.07 (0.05)
PTA—Dummy for two members in the same PTA	.64*** (.11)	0.64*** (0.11)	0.64*** (0.12)	0.64*** (0.11)

(continued)

Table 1. (continued)

Operational Variant of the Index of Similarity of Interests	(1)	(2)	(3)	(4)
			Regional Alliances Only	All Alliances
PTAEX—Dummy for PTA member exporting out of that PTA	.11 (.07)	0.11 (0.07)	0.12* (0.07)	0.12 (0.07)
PTAIM—Dummy for PTA member importing from outside that PTA	.05 (.06)	0.05 (0.06)	0.06 (0.06)	0.06 (0.06)
CURRENCY—Dummy for two members in the same currency block	.48** (.20)	0.47** (0.20)	0.48** (0.20)	0.47** (0.20)
CURRENCYEX—Dummy for currency block member exporting out of that block	-.16 (.13)	-0.16 (0.13)	-0.16 (0.13)	-0.16 (0.13)
CURRENCYIM—Dummy for currency block member importing from out of the block	-.19 (.12)	-0.19 (0.12)	-0.19 (0.12)	-0.19 (0.12)
R ²	.81	.81	.81	.81
Observations	857,435	857,435	857,430	857,412

Note: Results from high definition fixed effects (*reghdfe*) regressions, absorbing three categorical variables: a pair identifier, an exporter year identifier, and an importer year identifier. Entries are coefficient estimates and two-way clustered standard errors are in parentheses. The dependent variable is the natural logarithmic transformation of annual nominal USD exports of merchandise. The constant is not reported because in *reghdfe*, the constant is perfectly collinear with the sum of the fixed effects. Shaded entries are tests on sums of coefficients $FRIEND + WAR3 \times FRIEND$ assuming $WAR3 = 1$. WTO = World Trade Organization; PTA = Preferential Trade Agreement.

*.05 < p ≤ .10. **.01 < p ≤ .05. *** p ≤ .01.

Because we control for CPFE, EYFE, and IYFE, the historical state of bad relations between war combatants, which is not unique to war years, cannot explain this finding. Nor can other events particular to any year or particular to any state explain this result. However, as explained above, we cannot tell whether war reduced trade, more than trade reduced the incidence of war. Trade with third parties was lower too but by a smaller proportion (23 percent). Since regression (2) does not control for the

similarity of national interests, this effect aggregates political and business motives in trade with third parties.

Regressions (3) to (4) include the three variables that control for similarity of interests, each regression based on a different operational variant of this similarity. The effect of war on trade between combatants are unchanged compared with regressions (1) to (2). However, the statistical significance of the coefficient of WAR3 is weaker, which means that the effect that wars have on trade with third states is mostly the results of wartime trade policies by interested states and that business-driven trade with third parties is on average hardly affected. In other words, the ability to substitute trade with adversaries and local output for trade with third parties, and the better business and transportation environment in third parties compared with the war-ridden economies of the combatant states, seems to balance the negative effect of wartime economic recession in nonwar sectors and naval blockades.

The statistically significant coefficients of the interaction $\text{WAR3} \times \text{FRIEND}$ and ENEMY_FRIEND support Hypotheses 1 and 2, respectively, in both regressions. The magnitude of these two coefficients is larger in regression (4), when all alliances are considered. For example, looking at the coefficient of ENEMY_FRIEND , the trade of a combatant state was on average 25 percent ($=\exp(-0.29) - 1$) lower with a third party that had perfectly similar interest to those of its enemy according to regressions (3) or 36 percent lower according to regression (4).

Recall that the FRIEND variant used in regression (3) excludes alliances between all pairs consisting of states from different regions, but that both variants of FRIEND consider the military capabilities of states. Thus, the coefficients of FRIEND , $\text{WAR} \times \text{FRIEND}$, and ENEMY_FRIEND in regression (3) do not reflect the effects on trade of alliances with militarily capable powers of a different region (henceforth referred to as global military powers). It follows that the moderate wartime coefficients of the similarity of interests in regression (3) compared with those in regression (4), in which alliances with global military powers are considered, suggest that the latter influenced wartime international trade more than other states. In contrast, the insignificant coefficient of FRIEND in regression (4) suggests that global military powers were on average less engaged in peacetime strategic trade.

The overall effect of similarity of interests on trade with third parties (i.e., the marginal effect of FRIEND on the dependent variable when $\text{WAR3} = 1$) is given by the sum of coefficients of FRIEND and $\text{WAR3} \times \text{FRIEND}$, which is reported at the bottom of the table. Regression (3) shows in that in times of war, a third party with perfectly similar interests traded with a combatant state 42 percent ($=\exp(0.35) - 1$) more than a third party with zero similarity of interests. Conversely, a third party with perfect dissimilarity of interests ($\text{FRIEND} = -1$) traded with a combatant state 30 percent ($=\exp(-0.35) - 1$) less than a third party with zero similarity of interests. In peacetime, this difference is reduced to 15 percent ($=\exp(0.14) - 1$) more trade or 13 percent less trade, respectively. In regression (4), which considers global military

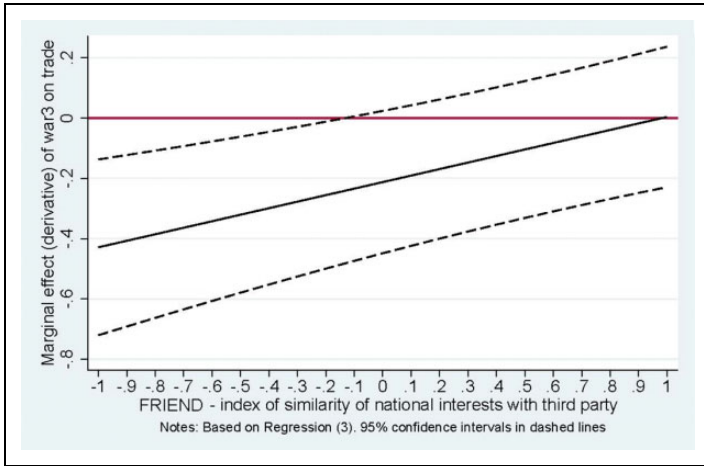


Figure 2. Effect of war on trade with third parties. Considering regional alliances only 1885 to 2000.

powers, these effects intensify in war to 46 percent and -32 percent but disappear in peace.

A more careful analysis of the marginal effects of WAR3 on the dependent variable yields further insights (Brambor, Clark, and Golder 2006). The solid line in Figure 2 shows this marginal effect as a function of FRIEND (95 percent confidence intervals in dashed lines) considering only alliances among regional powers (based on regression [3]). Up until roughly $\text{FRIEND} = -0.2$, this effect is negative (i.e., when war breaks trade with the third party falls) and significant (the top confidence interval is still negative). However, when FRIEND rises to roughly -0.1 , the top confidence interval crosses the zero line and the p value of the marginal effect (not reported in Figure 2) exceeds .05 (and rises for higher values of FRIEND). This means that war has no statistically significant effect on trade with third parties that share similar interests with the combatant state. Rather, the positive coefficient of the interaction of WAR3 and FRIEND reflects mostly the trade restrictions employed by countries with dissimilar interests—in effect hostile third parties. This result is compatible with the significant coefficient of WAR3 in regression (2), which aggregates political and motives in trade with third parties. Figure 3 shows a similar analysis based on regression (4), according to which war ceases to have a statistically significant effect on trade when FRIEND is a mere -0.7 . In other words, wartime trade policies of global military powers may have had a greater impact on trade than those of regional powers, but this is mostly true at extreme cases of hostility to the combatant country.

As for the control variables, their coefficients are almost identical throughout the four regressions. In accordance with Rose (2004), WTO membership has been associated with no more trade between member states than they would

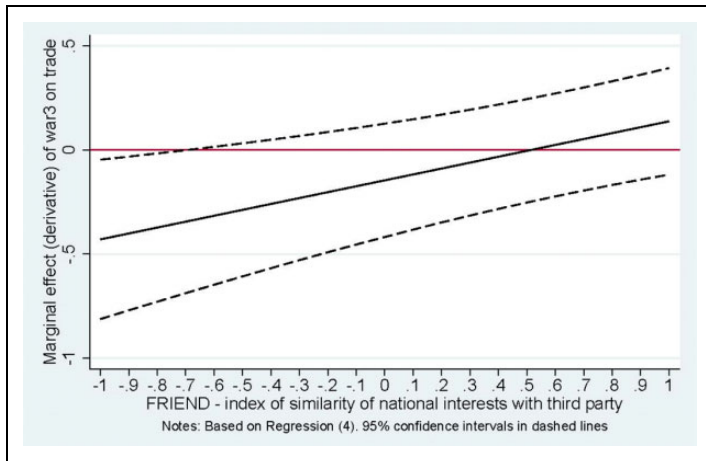


Figure 3. Effect of war on trade with third parties. Considering all alliances 1885 to 2000.

have developed without the WTO, given their various idiosyncrasies. PTA membership is shown to have been associated with 90 percent ($=\exp(0.64) - 1$) more trade. A currency union was associated with 62 percent greater trade among its member states, much less than the magnitude of currency-block trade creation suggested by a number of studies, including Rose (2000), Frankel and Rose (2002), and Glick and Rose (2002). The insignificance of the third-party coefficients of PTAs and currency blocks is probably the result of the multitude of bilateral arrangements involving small countries, which affected a limited number of third parties.

It is conceivable that the association between war and trade was different before and after 1950. Post-1950 trade was of a different nature than pre-1950 trade, consisting mainly of intraindustry trade in intermediate and semifinished goods, which is typical of modern global supply chains, rather than trade in finished goods. Wars may be more disruptive to the recent type of trade than to the earlier, more substitutable type (Gowa and Hicks 2015). This substitutability of trade may increase the magnitude of the coefficient of WAR3 (compared with the baseline category of trade between noncombatant states) in the post-1950 period but perhaps reduce the magnitude of the wartime effect of similarity of interests (because political manipulation of trade should have been more expensive).

In addition, the world wars may have had greater potential than other wars to depress trade between pairs of third parties because of the multitude of combatants and their geographical spread, which created multiple war theatres, and relatively more environmental damage to international transportation. Thus, eliminating the world wars from the data set should increase the magnitude of the coefficient of WAR (the effect of war relative to trade between noncombatants). Finally, historical

trade data sets are retrieved from a variety of sources with no international standard methods for defining and recording trade and thus may be noisy.

Thus, as a robustness check, Table 2 reports the results of the same regressions as in Table 1, this time eliminating the pre-1950 data. Because of the small number of states before 1950, and the quadratic effect that this has on the number of dyads, the number of observations falls only by roughly 44,000 or roughly 5 percent of the total. However, the number of WAR observations coded 1 falls by more than 15 percent.

A number of differences in the results of Tables 1 and 2 stand out. First, at 120 percent, post-1950 currency blocks had a much greater positive effect on trade than earlier one. This result is more in line with the literature cited above. Second, the effect of war on trade between combatant nations is larger after 1950 (a decline of 75 percent, if the coefficient of WAR is -1.37). Third, the effect of war on trade with third parties (coefficient of WAR3) has a higher magnitude and greater statistical significance in all columns compared with Table 1. These results conform to the expectations above.

The marginal effect of FRIEND on dependent variable when WAR3 = 1 (reported again at the bottom of the table) is larger in Table 2. Figures 4 and 5 again demonstrate that similarity of interests was mostly influential on trade in the range of negative FRIEND values, but in contrast to Figures 2 and 3, in the post-1950 period, moderate levels of positive similarity of interests with regional powers also had a statistically significant (if small) effect on trade. This evidence confirms that similarity of interests affects wartime international trade more in the form of trade obstruction by hostile noncombatant states than in the form of trade promotion by friendly noncombatant states, and that any politically friendly wartime trade is more typical of the post-1950 era.

Conclusions

Trade is commonly expected to reduce interstate violence if militarized conflicts harm trade among adversaries and with third parties; this study indeed provides evidence that wars are associated with reduced trade. However, few studies explain how wars affect trade with third parties. The few that do tend to refer to all third parties, as if they were a single player with uniform sensitivity to the conflict. This approach does not address the different national interests of third parties and the separate effect that war may have on business-driven trade with third parties.

This study contributes to the literature by arguing that trade between a combatant state and a noncombatant state increases (falls) when they have similar (opposing) interests but decreases (rises) when the noncombatant state has similar (opposing) interests with the enemy. In other words, trade rises with friendly and enemy-hostile third parties but falls with hostile and enemy-friendly third parties.

Of course, the private profit motivation of firms and the benefits to households from trading with counterparts in noncombatant states may not be compatible with national wartime trade policies. In cases of such misalignment of motivation, trade with third parties may adversely affect the effectiveness of wartime trade policies.

Table 2. Trade, War, and National Interests 1950–2000.

Operational Variant of the Index of Similarity of Interests	(5)	(6)	(7)	(8)
			Regional Alliances Only	All Alliances
WAR—Dummy for two warring states		−1.42*** (0.39)	−1.37*** (0.39)	−1.33*** (0.39)
WAR3—Dummy for a state at war trading with a state not at war with it		−0.37*** (0.11)	−0.31** (0.12)	−0.24* (0.14)
FRIEND—Similarity of interests between the two trade partners			0.16*** (0.04)	0.13 (0.09)
WAR3 × FRIEND—Wartime similarity of interests between the two trade partners			0.24*** (0.06)	0.32*** (0.09)
Marginal effect of FRIEND on dependent variable when WAR3 = 1			0.39*** (0.07)	0.45*** (0.12)
ENEMY_FRIEND—Similarity of interests between a third party and the war enemies of its trade partner			−0.28*** (0.06)	−0.44*** (0.10)
WTO—Dummy for pairs of two WTO member states	−.03 (.07)	−0.03 (0.07)	−0.03 (0.07)	−0.03 (0.07)
WTOEX—Dummy for WTO member exporting to WTO nonmember	−.00 (.05)	−0.00 (0.05)	−0.00 (0.05)	0.00 (0.05)
WTOIM—Dummy for WTO member importing from WTO nonmember	−.09* (.05)	−0.09* (0.05)	−0.09* (0.05)	−0.09* (0.05)
PTA—Dummy for two members in the same PTA	.66*** (.12)	0.65*** (0.12)	0.66*** (0.12)	0.66*** (0.12)

(continued)

Table 2. (continued)

Operational Variant of the Index of Similarity of Interests	(5)	(6)	(7)	(8)
			Regional Alliances Only	All Alliances
PTAEX—Dummy for PTA member exporting out of that PTA	.13* (.08)	0.13* (0.08)	0.14* (0.08)	0.14* (0.08)
PTAIM—Dummy for PTA member importing from outside that PTA	.07 (.06)	0.07 (0.06)	0.08 (0.06)	0.08 (0.06)
CURRENCY—Dummy for two members in the same currency block	.80*** (.23)	0.79*** (0.23)	0.79*** (0.22)	0.78*** (0.22)
CURRENCYEX—Dummy for currency block member exporting out of that block	-.01 (.14)	-0.01 (0.14)	-0.02 (0.14)	-0.02 (0.14)
CURRENCYIM—Dummy for currency block member importing from out of the block	-.05 (.13)	-0.05 (0.13)	-0.06 (0.13)	-0.06 (0.13)
R ²	.80	.80	.80	.80
Observations	813,567	813,567	813,563	813,545

Note: See notes to Table 1.

Firms and households may not necessarily be inclined to act as foreign policy tools of governments and may attempt to evade government policy.

Methodologically, this study innovates with the largest data set ever used in this literature, which distinguishes exports from imports rather than aggregate them, and encompasses all countries and territories with trade statistics between 1885 and 2000. This data set improves the precision of the estimates and the external validity of the findings and enables better controls for omitted variables. We apply a particular set of fixed effects to a gravity model based on recent advances in the field of trade economics, two-way clustering, and use recent software developments.

We find that hostile third parties, especially global military powers, tended to reduce trade with a combatant state by roughly 30 percent. In addition, trade with third parties friendly to the enemy fell by a similar magnitude. In contrast, war

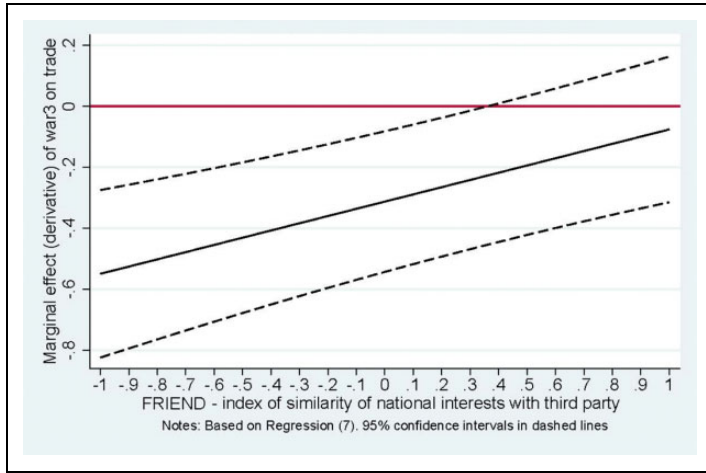


Figure 4. Effect of war on trade with third parties. Considering regional alliances only 1950 to 2000.

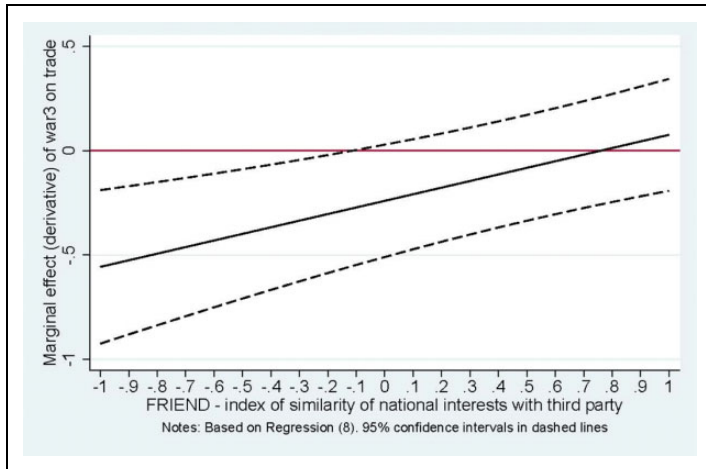


Figure 5. Effect of war on trade with third parties. Considering all alliances 1950 to 2000.

hardly affected business-driven trade with third parties. It seems that the ability to substitute trade with adversaries and local output for trade with third parties, and the better business and transportation environment in third parties compared with the war-ridden economies of the combatant states, balanced the negative effect of wartime economic recession in nonwar sectors and naval blockades. This result may explain conflicting empirical findings in existing literature, especially when confined to particular episodes and states.

As a robustness check, we repeat the same tests without the pre-1950 data and find that war depressed trade with third parties more significantly. We believe this result reflects the lower substitutability of trade flows after 1950, which form global supply chains, compared with trade in finished goods that is more typical of earlier periods. However, in spite of the growing opportunity costs, wartime trade policies, especially trade obstruction by hostile noncombatant states, became only more effective after 1950.

Admittedly, our results are based on a period that ended 14 years ago and thus may not consider recent patterns of behavior. In addition, our study does not consider the direct costs of wars in terms of lost life and property as well as the direct financial cost of wars (such as payments for arms, fuel, and other war essentials). All of these costs are indirectly considered here only to the extent that they come back to affect international trade. However, the results of this study point to the need for a more comprehensive research agenda of the effects of war on third parties.

Acknowledgments

We thank an anonymous referee as well as Tobias Böhmelt, Francisco Pino, and other participants at the 2015 PEIO meeting in Berlin for their helpful comments. Yael Shomer provided important methodological suggestions and Sergio Correa directed us to the most developed version of a relevant *Stata* command. Helen Milner and Lawrence Broz provided helpful tips and Robert Pahre shared his pre-1914 PTA data. Yotam Margalit, Udi Sommer, and Yael Shomer helped us finance the necessary hardware. We thank them all. Nizan Feldman conveys his gratitude to the Leonard Davis institute for International Relations for its support.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Supplemental Material

Supplementary material for this article is available online.

Notes

1. For a full review of the scientific literature on Commercial Liberalism, see Barbieri and Schneider (1999), Mansfield and Pollins (2003), and Schneider (2010).
2. Barbieri (1996, 2002) dissented, but Xiang, Xu, and Keteku (2007) attributed her findings to methodological issues (Schneider 2014). Other scholars conditioned the pacifying effects of trade on the existence of democratic national institutions (Gelpi and Grieco 2008) or PTAs (Mansfield and Pevehouse 2000) and on the inelasticity of import demand

- and export supply (Polachek and McDonald 1992). Polachek (1980) and Pollins (1989b) preferred to use events data to show that trade increases (decreases) cooperation (conflict).
3. However, Polachek and Xiang (2010) argue that opportunity costs are the decisive factor in decreasing the probability of war even in the signaling models.
 4. See Anderton and Carter (2001); Keshk, Pollins, and Reuveny (2004); Keshk, Reuveny, and Pollins (2010); Kim and Rousseau (2005); Mansfield and Bronson (1997); Oneal, Russett, and Berbaum (2003); Polachek (1980, 1997); Pollins (1989a, 1989b); Reuveny (2001); Reuveny and Kang (2003); Russett and Oneal (2001). For different results, see Barbieri and Levy (1999); Blomberg and Hess (2006); Mansfield and Pevehouse (2000); Morrow, Siverson, and Tabares (1998); and Reuveny and Kang (1998).
 5. Sometimes trade between direct belligerents can continue during hostilities, as Barbieri and Levy (1999) show. However, there is no evidence that trade with third parties did not continue as well, or even rise, so it is hard to draw firm conclusions about the balance of war effects in such cases.
 6. Alternatively, scholars use Oneal and Russett's (2005) data, but it does not distinguish exports from imports. Some use Gleditsch's (2002) trade data, which codes missing observations as zero trade if both states appear in International Monetary Fund reports. However, that data set does not cover the pre-1950 period. Nevertheless, using it for the regressions in Table 2 below provides similar support for our hypotheses.
 7. The index of importer prices and the exporter's market access make up what Anderson and Van Wincoop (2003) referred to as multilateral trade resistance. See Anderson (1979), Baldwin *et al.* (2008, 10-17), and Bergstrand (1985) for a more detailed exposition.
 8. Specifically, we installed the newly developed *reghdfe* command on our STATA 13 8-core SE package.
 9. Note that the sum of all exporter-year fixed effects and importer-year fixed effects is equivalent to a set of year dummies.
 10. We thank Sergio Correa for directing us to the development version of *reghdfe*, which allows two-way clustering of the errors.
 11. Data on World Trade Organization/General Agreement on Tariffs and Trade membership is taken from Martin, Mayer, and Thoenig (2008). Data on PTA membership for 1950-2000 is taken from Mansfield, Milner, and Pevehouse (2007), who include under PTAs any reciprocal arrangements. Pre-1914 PTA data are based on Pahre (2007), interwar PTA data on Gowa and Hicks (2013). Data on currency block membership for 1950-2000 are taken from Glick and Rose (2002). They defined currency blocks as country pairs, whose monies are either common or interchangeable at 1:1 par for an extended period. Earlier data on currency blocks (but using the same definition) is based on Bordo and Jonung (1999) and López-Córdova and Meissner (2003).
 12. Of course, states with conflicting interests are likelier eventually to go to war with each other compared with states that have similar interests. However, since these data have a time dimension, these low Pearson coefficients mean that the degree of similarity of interests is a poor predictor of the timing of war.

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