

KIEL WORKING PAPER

Bilateral trade and conflict heterogeneity

The impact of conflict on trade
revisited



No. 2222 June 2022

Katrin Kamin

ABSTRACT

Bilateral trade and conflict heterogeneity

Katrin Kamin

Although the number of interstate disputes has fallen in the past 30 years, rising geopolitical competition is challenging the foundation of the absence of great power war. Additionally, the number of internal conflicts is surging. At the same time, globalisation has spun a net of global trade connections and has thus created dependencies, making everyone more vulnerable to the repercussions of conflict. In this context, this paper analyses the relationship between trade and conflict from a trade perspective: Using data from UCDP and COMTRADE this paper studies the effects of five different conflict types on international trade flows in the period 1992 - 2011, including interstate and internal conflicts as well as other types of violence. Applying the gravity equation of international trade and the ppml high-dimensional fixed effects estimator, this paper finds that the heterogeneity of conflict types and their distinct characteristics matter for the magnitude and direction of their influence on trade.

Keywords: Gravity, Trade, Conflict

JEL classification: F14, F51

Dr. Katrin Kamin

Institut für Weltwirtschaft

Kiellinie 66

24105 Kiel

E-Mail: katrin.kamin@ifw-kiel.de

www.ifw-kiel.de/kamin

I would like to thank Yoto V. Yotov, Keith Head, Holger Görg, Thierry Mayer, Christine Merk, Marie-Catherine Riekhof and Katerina Homolkova for excellent comments and support throughout the project. I would furthermore like to thank participants of presentations of the project at Brown Bag Seminar in Economics, Kiel, International Conference on Economics and Security, European Trade Study Group Conference, Aarhus-Kiel Trade Workshop and Jan Tinbergen European Peace Science Conference for valuable comments and suggestions. All remaining errors are my own.

The responsibility for the contents of this publication rests with the author, not the Institute. Since working papers are of a preliminary nature, it may be useful to contact the author of a particular issue about results or caveats before referring to, or quoting, a paper. Any comments should be sent directly to the author.

Photo by Chester Ho on Unsplash, <https://unsplash.com/photos/M2SSMQIo0uU>

1 Introduction

The trade war emanating from the United States under U.S. president Donald Trump only highlighted the ongoing and persistent shift from classical warfare between states to coercive economic instruments such as tariffs and the like - a shift that can be also observed in falling numbers of interstate conflicts. But although great powers use geoeconomic means more often for coercion, slowing globalization, growing populism, illiberalism and rising geopolitical competition are actually challenging the foundation of the absence of great power war, that has been known as the "Long Peace", the most recent example being the Russian invasion of Ukraine. Moreover, although numbers of interstate disputes have fallen, conflicts within states have increased and are by far more destructive in terms of human losses (see Figure 1).

Close trade relationships are usually regarded as preventing countries from fighting each other. And if conflict takes place, it is expected to impact on trade: The disruption of production and thus of exports, and the deterring effect of conflict through insecurity on imports/exports and investments are only a few examples of why trade is vulnerable to conflict. Besides the dramatic effects for humans and nature, conflict is costly in economic terms. The World Bank estimated that the armed conflict in Syria resulted in a cumulative loss in Syrian GDP of \$226 billion (The World Bank, 2017) and Nordhaus projected, that the invasion of Iraq would cost the US overall nearly \$2 trillion (Nordhaus, 2002). Both examples underline the drastic economic impact of these very different types of conflict on the national level, however, the trade effects of conflict transmit these externalities across national borders. While this "globalization" angle of conflict may seem obvious, surprisingly few studies have examined the impact of conflict on trade flows.

By employing the gravity model of international trade and by using data on five different conflict types by the Uppsala Conflict Data Program (UCDP) this paper addresses the question: What is the scope and the effect of internal, interstate or internationalized types of conflict on bilateral trade flows? Understanding the differences in the effects of conflicts on trade and their magnitude is essential for a better understanding of (i) the extent to which different conflict types impact on trade (ii) the losses and/or gains in trade as a component of the economic repercussions of conflict. Accordingly, this paper contributes to two parts of the existing literature: First, by using the most fine-grained conflict categorization available this study accounts for the changed nature of conflicts and thus ties in with attempts to quantify the effects of other forms of conflict than solely interstate war on international trade (Blomberg and Hess, 2006; Long, 2008; Couttenier and Vicard, 2011; Marano et al., 2013; Qureshi, 2013). Second, this paper contributes to the ongoing gravity literature on conflicts as determinants of international trade by adding new insights and re-evaluating earlier results from the literature (Glick and Taylor, 2010; Martin et al., 2008).

The remainder of the paper is structured as follows: Section 1.1 gives an overview of the literature while section 1.2 provides information on the data analyzed. In section 1.3.1 and 1.3.2 the methodology and empirical implementation are outlined, followed by a presentation of results and robustness checks in section 1.4. Results are discussed in section 1.5 and section 1.6 concludes.

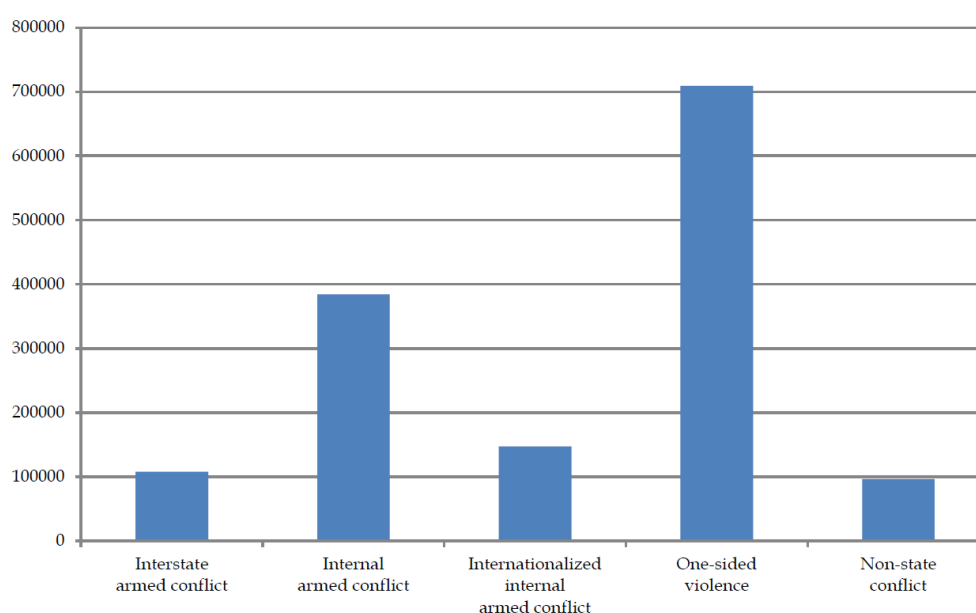


Figure 1: Total battle-related deaths per conflict type for the years 1992 – 2011.

Source: UCDP Battle-Related Deaths Dataset Version 18.1 (UCDP Battle-Related Death dataset version 18.1, 2017), Pettersson and Eck (2018); own visualization.

1.1 Literature

The economic literature shows that conflicts have a severe impact on economies. Countries face the loss of humans, property and infrastructure as a result of conflict - factors that are crucial for producing and trading goods (see e.g. Donaldson, 2018). Private and social capital, but as well public spending is redirected towards inputs for conflict (Murdoch and Sandler, 2002; Collier, 2003; Anderton and Carter, 2009), which in turn affects national income and thus economic growth (see e.g. Blomberg and Hess, 2002; Chauvin and Rohner, 2009; Collier, 1999, 2003; Stewart and Fitzgerald, 2000). Firms and stock markets react to political and economic insecurity (Long, 2008; Abadie and Gardeazabal, 2003; Guidolin and La Ferrara, 2007). Altogether, this impacts negatively on production (inward-shift of the production-possibility-frontier), distribution of traded goods (increased transportation cost) and consumers buying power as well as foreign firms' will to invest (risen opportunity costs).

However, trade and conflict affect each other simultaneously (see e.g. Pollins, 1989; Reuveny and Kang, 1996; Hegre et al., 2010). Given the importance for trade policy and international relations the impact of trade on international relations and the likelihood of war and peace has been studied in-depth. The debate shapes along the lines of the liberal and realist assumptions, with empirical¹ and theoretical² results in favor of both arguments: while liberalists make the case that trade promotes peace via generated economic benefits, realists argue that trade might increase conflict potential via asymmetries.

Meanwhile, there is comparably little research focusing on the impact of conflict on actual trade flows. The few studies available mainly restrict their analysis to wars between states or even just wars between major powers.³ Barbieri and Levy (1999) find no evidence that war between major powers reduces bilateral trade, although the anticipation of war is resembled in the trade data. Along the same lines, Mansfield and Pevehouse (2000) do not find a significant effect of militarized interstate disputes⁴ (MIDs) on bilateral trade. However, these two studies contrast the results of the majority of papers, finding a negative relationship between MIDs and trade: Anderton and Carter (2001) find strong evidence that interstate war between major but also between non-major powers is connected to a decrease in trade between the pre- and post-war period. Martin et al. (2008) estimate that trade falls by 22% during a MID and that this negative impact remains constant for another three years after the respective war. This persistent negative effect seems to not only apply to countries in conflict, but also to neutral countries and hence impacts on global economic welfare (Glick and Taylor, 2010).

Overall, studies either focus on interstate disputes or major-power wars and the majority finds significant negative effects of these conflict types on trade. This resembles very well the fact that until the 1960s, *interstate armed conflict* (conflict between two or more states)⁵ was the prevalent form of conflict. However, since then until today, the number of *internal armed conflicts* has dramatically increased. The end of World War II has brought about not only a decline in “classic” interstate armed conflict, but also a sharp increase in revolutions, terrorism and insurgencies (Levy,

¹Studies examining empirically the impact of trade on conflict are e.g. Anderton (2003); Li and Reuveny (2011); Hegre et al. (2010); Russett and Oneal (2001); Polachek et al. (1999).

²For a detailed discussion of the two theories see e.g. Anderton et al. (2003); Barbieri and Reuveny (2005); Hegre (2014, 2018); O’Neal and Russett (1999); Polachek and Seiglie (2007).

³One particularly well studied field is the impact of diplomatic relations and military alliances on trade (Polachek, 1980; Pollins, 1989; Gowa and Mansfield, 1993; Mansfield and Bronson, 1997)

⁴“Militarized interstate disputes are united historical cases of conflict in which the threat, display or use of military force short of war by one member state is explicitly directed towards the government, official representatives, official forces, property, or territory of another state. Disputes are composed of incidents that range in intensity from threats to use force to actual combat short of war.” (Jones et al., 1996, p.)

⁵For detailed definitions of all conflict types, see Section 1.2.

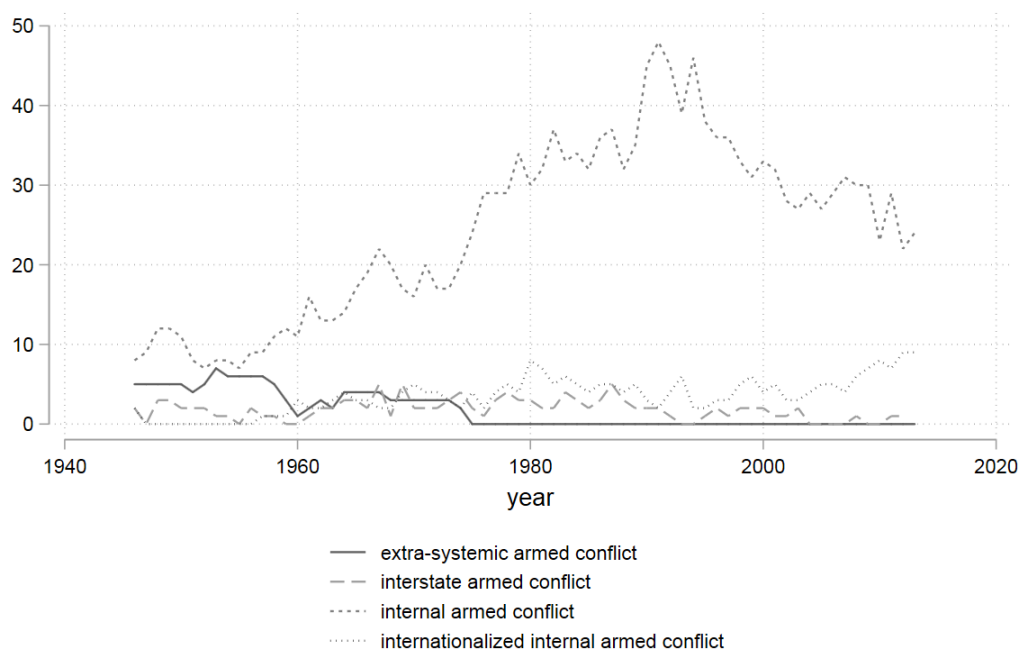


Figure 2: Number of armed conflicts in the world by type, 1946 - 2016. Source: UCDP Armed Conflict Dataset Version 4-2014, Gleditsch et al. (2002); Themnér and Wallensteen (2014); own visualization.

2007). Further, data from the Uppsala Conflict Data Program (UCDP) shows that these purely internal conflict types are the most destructive in terms of human losses.

However, despite the rising numbers of internal conflicts (see Figure 2 and 3), these conflict types have been severely understudied in the literature. Only a small amount of papers has addressed the effects of these types of conflict on bilateral trade. Bayer and Rupert (2004) use “civil war” - which includes military and governmental involvement, effective resistance and at least 1,000 battle deaths - and find that civil wars yield a 30% decrease of bilateral trade. It remains unclear whether their definition of conflict includes the involvement of foreign governments and it is questionable why conflicts displaying less battle deaths should not be included in the analysis. Furthermore, they apply ols estimation which was later shown to be severely biased when estimating the log-linear version of the gravity model (Santos Silva and Tenreyro, 2006). Marano et al. (2013) focus on “interstate” and “intrastate conflict”, where the former refers to conflict between states including resistance of foreign domination and the latter includes ethnic conflict and conflict between rival political groups. Again, these conflict definitions do not allow for a differentiation between third-party involvement and pure intrastate conflict or a mixture of both. They conclude that internal conflicts have an even larger negative impact on trade than interstate conflicts. Long (2008) and Blomberg and Hess (2006) make use of a more detailed distinction: Long (2008) differentiates between “internal”, “internationalized internal” and “interstate armed conflict” and finds that even expectations of an internal conflict

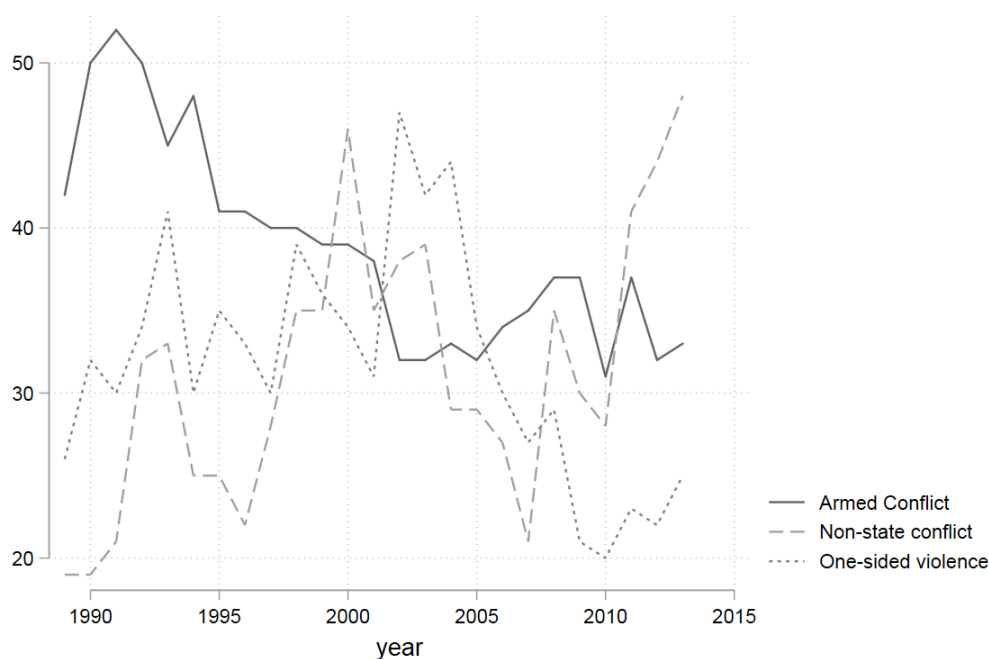


Figure 3: Global trends in armed conflict, *non-state conflict* and *one-sided violence*⁶: Number of conflicts by type and year (1989-2013). Source: Uppsala Conflict Data Program; own visualization.

can lead to a reduction of trade. Blomberg & Hess (2006) disaggregate even further and assess the impact of violence including terrorism, revolutions, interethnic fighting and external conflict on trade. They find that the occurrence of violence has the same effect as a 30% tariff on trade, which suggests that violence has a much larger negative effect than other trade impediments. Nonetheless, their results may probably be biased as they as well apply ols estimation.

Overall, studies focusing on the trade effect of different forms of conflict display two distinct features. First, they aggregate different conflict types into one category, making a distinction between vastly differing conflict types impossible and thus limiting the validity of their results. Second, while mostly making use of the gravity equation, all studies fall short of applying a theory-consistent estimation. This is mainly due to the fact that the gravity literature and estimation has been evolving fast in the past 20 years. This however means that the results of the above mentioned literature are likely biased.

Literature examining the relationship between conflict and trade has - for good reason - in great parts⁷ relied on the gravity equation (Tinbergen, 1962): First, because it is the workhorse for estimating the impact of policy variables such as currency unions and regional or preferential trade

⁷There are some exceptions: Morrow et al. (1999); Vicard (2008) and Rohner et al. (2013) use a game-theoretical framework for their analysis; Anderton and Carter (2001) and Barbieri and Levy (1999) employ interrupted time series analysis, and Hegre et al. (2010) use a simultaneous equations model.

agreements on trade flows (see e.g. Baier and Bergstrand, 2007; Glick and Rose, 2002; Rose, 2004). Second, because conflict can be regarded as a policy variable, and third, because the crucial factor in gravity, namely the distance between trading partners, influences both trade and conflict (Hegre et al., 2010; Chang et al., 2004).

Assessing the effects of conflict on trade implies dealing with country-level as well as country-pair-level heterogeneity. Furthermore, multilateral trade resistance and unobservable trade barriers need to be accounted for (Anderson and Van Wincoop, 2003; Baldwin and Taglioni, 2007; Baier and Bergstrand, 2007). Thus, an estimation with a full set of fixed effects, namely country-time and country-pair fixed effects, is necessary. The additional need to address heteroscedasticity and to tackle zero-trade flows by the use of poisson pseudo maximum likelihood estimation (ppml) as proposed by Santos Silva and Tenreyro (2006), led to the development of the ppml high-dimensional fixed effects (hdfe) estimator by Zylkin (2017), which opens up a quicker way for a usually lengthy estimation of several fixed effects in a ppml setting.

The use of ppml is particularly important in the study of conflict and trade: first, especially conflict-ridden countries tend to exhibit low or zero trade flows. Adding an arbitrary number to the dependent variable to make the equation log-linearizable might distort the picture (as shown in Eichengreen and Irwin, 1995, 1997; Felbermayr and Kohler, 2006). The estimation in levels is thus desirable. Second, the relationship between conflict and trade is reciprocal. The ppml hdfe estimator addresses this endogeneity by accounting for unobserved time-invariant heterogeneity.

1.2 Data

This study spans the time series 1992 to 2011. Observations are not limited to major-power dyads⁸ as seen in great parts of the literature: The trade data contains information on 236 countries and includes all available export and import pairs. Bilateral trade data (in 1000 US\$) taken from the UN Comtrade database (UN Comtrade Database, 2008) and is defined at cost insurance and freight values. Information on the GDP of exporter and importer (in current US\$) is taken from the World Development Indicators (WDI) (World Development Indicators, 2013). Distance accounts for geographic characteristics and represents the usual gravity controls together with preferential trade agreements. As a measure of distance the population weighted great circle distance between the countries most populated cities is used (The Gravity database, 2015).

⁸The limitation of the analysis to major-power dyads is problematic because it creates a non-random sample and hence limits valid inference (for a discussion see e.g. Benson (2005); Lemke and Reed (2001)). This procedure is seen especially in early studies on conflict and trade and is mostly due to the limited availability of trade and conflict data. Fortunately, data availability has improved significantly during the past two decades.

UCDP conflict data used in this paper has several advantages compared to other data⁹: conflict categories include all possible internal and external conflicts (except the sole threat or display of the use of force¹⁰), ranging from armed group clashes without government participation, over repression exerted by governments towards civilians, to civil war with participation of external governments. Hence, there is a very clear and detailed distinction between interstate conflicts and internal conflicts, which is crucial for this study: in contrast to former research that either looked at MIDs or civil war, this fine-grained conflict categorization allows to compare their impact on trade flows and thus to get a better understanding of the economic cost of conflict.

To obtain a dataset that covers the described broad range of conflicts, three datasets from Uppsala Conflict Data Program (2014) /Peace Research Institute Oslo (PRIO) were combined: the Armed Conflict¹¹ dataset, the *Non-state conflict* dataset and the *One-sided violence* dataset.

⁹For a detailed discussion of conflict data see, e.g. Boese and Kamin (2019); Keshk et al. (2010).

¹⁰Hence, the deterioration of international relations triggered by spoken threats or the display of troops, as for example currently seen in different communications of the Trump administration towards North Korea, Russia, or China, would not be included in the data, since UCDP only codes a conflict as such once 25 battle-related deaths are recorded.

¹¹Armed conflict by definition generally also includes extra-systemic conflict, but this category basically contains colonial conflicts. The last extra-systemic conflict ended in 1974. Hence, no extra-systemic conflict is covered by the timeseries of the present dataset.

Table 1: Summary statistics for all variables used in the analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
year	418,027	2002.498	5.470938	1992	2011
Exports	417,211	1.91e+09	9.18e+10	0	1.50e+13
population-weighted distance	401,136	7382.622	4520.537	35.59131	19734.89
preferential trade agreement	418,023	.0775603	.2674788	0	1
i or j in interstate armed conflict	418,027	0.0217091	0.1457323	0	1
i or j location of an interstate armed conflict	418,027	0.0190969	0.1368657	0	1
i or j in internal armed conflict	418,027	0.2028434	0.4021173	0	1
i or j in internationalized internal armed conflict	418,027	0.2799436	0.4489718	0	1
i or j location of an internationalized internal armed conflict	418,027	0.0221923	0.1473089	0	1
i or j in non-state conflict	418,027	0.1402326	0.3472286	0	1
i or j in one-sided violence	418,027	0.1851483	0.3884183	0	1
i or j have a neighbor at war	418,027	0.4754167	0.4993959	0	1
Both in interstate armed conflict	418,027	0.0001364	0.0116763	0	1
Enemies in interstate armed conflict	418,027	0.0000646	0.0080365	0	1
Both in internal armed conflict	418,027	0.011449	0.1063859	0	1
Both in internationalized internal armed conflict	418,027	0.0450497	0.2074135	0	1
Enemies in internationalized internal armed conflict	418,027	0.0000885	0.0094076	0	1
Both in non-state conflict	418,027	0.0049518	0.0701949	0	1
Both in one-sided violence	418,027	0.0098965	0.0989877	0	1

From these three datasets five conflict types across a total of 128 countries are considered in this paper. The first three conflict types are armed conflicts, which always include at least one government as a warring party in the conflict and are defined as “[...] a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths” (UCDP/PRIO, 2014; Gleditsch et al., 2002; Themnér and Wallensteen, 2014). Definitions of these three conflict types (taken from UCDP/PRIO, 2014) and their occurrence in the dataset are as follows:

- *interstate armed conflict* (with a total of 7 events):
“[...] occurs between two or more states”, such as e.g. the ongoing conflict between India and Pakistan in Kashmir
- *internal armed conflict* (with a total of 107 events):
“[...] occurs between the government of a state and one or more internal opposition group(s) without intervention from other states”, such as e.g. the conflict between Turkey and PKK or Israel and the Hamas
- *internationalized internal armed conflict* (with a total of 25 events):
“[...] occurs between the government of a state and one or more internal opposition group(s) with intervention from other states (secondary parties) on one or both sides”, among those the more prominent ones such as e.g. the conflicts in Iraq or Afghanistan, but as well the ongoing conflict in Congo

Non-state conflict does per definition not include states as warring parties, while *one-sided violence* describes the aggression against civilians by the government or an organized group. Definitions of these two conflict types and their occurrence in the dataset are as follows:

- *non-state conflict* (with a total of 414 events):
“[...] the use of armed force between two organized armed groups, neither of which is the government of a state, which results in at least 25 battle-related deaths in a year.” (Sundberg et al., 2012a,b), such as e.g. the fights between the groups Hizb-i-Islami-yi Afghanistan and the Taleban or the ongoing drug war in Mexico between different cartels
- *one-sided violence* (with a total of 206 events):
“[...] the use of armed force by the government of a state or by a formally organized group against civilians which results in at least 25 deaths” (Eck and Hultman, 2007; Kreutz, 2008), such as cases of repression and genocide as in Guatemala or Darfur

UCDP codes a conflict as such once a minimum threshold of at least 25 battle-related deaths

per year is reached.¹²

Furthermore, UCDP reports different sides to a conflict namely side A, side B, side A second and side B second.¹³ This is important because a decision has to be made which sides to include as conflict observations. This comes down to the question whether one assumes that all sides to a conflict respond to the same level of involvement. One could argue that the side with primary claim to the conflict (namely side a) has the highest involvement level in the conflict. To obtain as many conflict observations as possible and by assuming that conflict has an impact on trade no matter on which side of the conflict an actor stands, all conflict involvements on all sides were included. To account for possible differences in conflict involvement, the dummy "Enemy" was created for the cases of *interstate armed conflict* and *internationalized internal armed conflict*, to differentiate the primary warring parties from the supporters.

Another important information is whether the country was actually the location of the conflict. A country experiencing conflict on its territory can be expected to be more severely impacted on by that conflict than a country that is sending troops. Furthermore, in order to merge the conflict data with the trade data, conflicts have to be attributable to a country. Accordingly, all conflict datasets were combined via the variable "Location". For the armed conflict category "Location" is unequal to the geographical location of conflict, but describes the country of the government with the primary claim to the conflict. For the categories *non-state conflict* and *one-sided violence*, the variable "Location" indicates the geographical location of the conflict.

Obviously, a bias arises from combining conflict observations that yield the hidden information of being a war zone, and the ones that are not. To differentiate countries where conflict took place from others, the dummy "Location" was created, which indicates whether the respective country is location of conflict or not.¹⁴ This study does not distinguish between a country being location of one or of more than one conflict. Hence, the location dummy is equal to 1 if a country is location of at least one conflict of that type. A detailed overview of all conflict type involvement per country

¹²Note that the numbers on battle-related deaths are not attributable to each actor, but rather are total battle-related deaths per year within the respective conflict.

¹³Side A always represents the party which has the primary claim to the conflict, side B represents the opponent and the secondary sides the respective supporters. Secondary sides are only reported for the armed conflict case. Within this category, side A represents a government, side B may be a government (for example in the cases of *interstate armed conflict* and *internationalized internal armed conflict*), but can also be a non-state actor (e.g. paramilitary group, rebel group, etc.). In the category *one-sided violence*, side A may be a government, but can also be a non-state group, while in *non-state conflict* both actors are per definition non-state actors.

¹⁴This dummy was created by means of the "Location" variable provided in the UCDP data. As described above, the information comprised by the location variable differs between the datasets. However, UCDP points out that in the armed conflict category "[...] in practice, "location" often equals the geographical location of the violence." (?). All armed conflicts were checked to make sure only countries that where location of conflict would be included in the dummy. Adjustments had to be made in the case of the invasion of Iraq, where the "locations" United States, United Kingdom and Australia were dropped, since the battle only took place in Iraq.

can be found in the appendix.

Two important features about the conflict data that have to be considered when interpreting the results have to be pointed out: First, while the *interstate armed conflict* country group largely consists of countries that also were the location of the conflict (80%), the reverse is true for *internationalized internal armed conflict*, where only 24.4% were the location of conflict. Second, the extent to which different conflict types appear simultaneously is striking: all 15 countries involved in *interstate armed conflict* have been involved in at least one other type of conflict before or during the same time. For *internal armed conflict* the picture is very similar with only one country out of 60 being solely involved in that conflict type and not in another. *internationalized internal armed conflict* paints a different picture: 65.6% are solely involved in this conflict type during the time series, but only one country in this group is conflict location. As shown above, this group mainly consists of countries that are involved in conflict from afar and those countries that are location of an *internationalized internal armed conflict* as well host other conflict types. *Non-state conflict* (96.6%) and *one-sided violence* (93.4%) again are proof for the argument made above that conflict types strikingly often appear simultaneously.

Finally, the question whether neighboring countries are affected by conflict (see Marano et al., 2013; Qureshi, 2013; Couttenier and Vicard, 2011; De Groot, 2010; Carmignani and Kler, 2016, for a detailed discussion) is addressed by adding the dummy variable "Neighbor", which is equal to one if a neighboring country of the exporter or the importer is in conflict. This dummy was created using the information from the "location" variables in the UCDP data and the Direct Contiguity (v3.2) Dataset from the Correlates of War Project¹⁵. From this dataset, the category "Land contiguity" is used, which is defined as "[...] the intersection of the homeland territory of the two states in the dyad, either through a land boundary or a river (such as the Rio Grande in the case of the US-Mexico border) [...]"¹⁶(Correlates of War Project. Direct Contiguity Data, 1816-2016. Version 3.2., 2016).

1.3 Model, Methodology & Estimation

1.3.1 Model & Methodology

The present paper employs the gravity model of international trade to examine the impact of conflict on trade. However, the single equation nature of the gravity model does not account for the simultaneity bias inherent in the study of conflict and trade and might thus lead to inconsistent and

¹⁵Correlates of War Project. Direct Contiguity Data, 1816-2016. Version 3.2.; Stinnett et al. (2002).

¹⁶Note that, due to lack of a clear definition of "contiguity" on the part of CEPII, a clearly defined contiguity measure for the construction of the neighbor-at-war variable was chosen, following the approach of Qureshi (2013).

biased results (Polachek, 1980; Polachek and Seiglie, 2007). One option to solve this endogeneity problem would be an instrumental variable approach, but most eligible variables - such as preferential trade agreements or military expenditures - are correlated with both trade and conflict and do hence not serve as proper instruments (see Hegre et al. 2010, Martin et al. 2008, Polachek & Seiglie 2007). The most promising alternative to deal with simultaneity is to exploit the variation over time by including country-pair fixed effects which control for omitted time-invariant country-pair characteristics (Glick and Taylor, 2010; Head and Mayer, 2014). Estimating the gravity equation with country-pair fixed effects has two pitfalls: First, an analysis of bilateral control variables is not possible. Second, a theory consistent estimation with the ppml model proposed by Santos Silva & Teneyro (2006)¹⁷ controlling for multilateral trade resistance is only possible if a multilateral resistance measure is constructed and implemented (as proposed e.g. by Baldwin and Taglioni, 2006; Head and Mayer, 2000; Head, 2003). Larch et al. (2018) proposed a further development of the ppml panel estimator which introduces a full set of fixed effects - namely exporter-time, importer-time, and pair fixed effects - to the estimation. This allows the estimation of a gravity equation controlling for multilateral trade resistance and simultaneity and hence serves in this paper as the estimator of choice.

Breusch-Pagan-tests were performed to test for the presence of heteroscedasticity. A p-value less than 0.001 was obtained in all cases, strongly rejecting the null-hypothesis of homoscedasticity. Estimating the constant elasticity model in log-linear form is thus inadequate and the ppml-specification remains the estimator of choice. Additionally, the squared correlation coefficients between observed and predicted values of the dependent variable were calculated as a measure of goodness-of-fit (reported in Tables A.2 - A.6). Despite the overall good fit of the gravity model in all specifications, the R^2 for the ppml-specifications displays higher values than for the linear form.

Nevertheless, the ppml estimation strategy as well holds a few pitfalls that have to be considered: "In the presence of importer and exporter fixed effects a variety of potentially interesting trade determinants can no longer be identified in a gravity equation. Notably, (1) anything that affects exporters' propensity to export to all destinations [...], (2) variables that affect imports without regard to origin, [...] and (3) sums, averages and differences of country-specific variables. If any variable of these three forms is added to a trade equation estimated with importer and exporter fixed effects, programs such as Stata will report estimates with standard errors. However the estimates are meaningless" (Head and Mayer, 2014, p. 158). Hence, to include country-based time-variant dummies in the estimation, these have to be bilateralized, otherwise Stata will either drop them because of collinearity or report biased estimates. Accordingly, the dummy variables conflict, location and neighbor were bilateralized to keep them in the estimation. Thus, the conflict dummy yields

¹⁷In Stata, the conventional ppml command does not allow for the inclusion of country-pair fixed effects.

the information whether the exporter or the importer have been in conflict. This implies that no conclusion can be drawn for the exporter or the importer specifically, but rather more generally for one of both being in conflict. For the case where both countries in the dyad are involved in conflict another dummy is introduced which indicates when both countries are involved in the same conflict in a given year.

To make differences visible and comparable with past results from the literature and to check for robustness the gravity model is estimated in four specifications, namely

- (A) ols with country-time fixed effects (ctfe)
- (B) ols with exporter-time and importer-time and country-pair fixed effects (hdfe)
- (C) ppml with exporter-time and importer-time fixed effects (ctfe)
- (C) ppml with exporter-time and importer-time and country-pair fixed effects (hdfe)

Specification (D) is the estimator of choice. Results are presented in Table 2. Robustness checks are provided in the Appendix (Tables A.2 - A.6). Specifications (A) and (B) are estimated with the Stata command 'reghdfe' written by Sergio Correia (Correia, 2016). Specification (C) is estimated with Stata command 'ppml_panel_sg' by Zylkin (2017). To estimate only country-time fixed effects, pair fixed effects were suppressed with the "nopair" option of the 'ppml_panel_sg'-command.

1.3.2 Estimation

The present study applies a gravity model with a ppml hdfe estimator to examine the impact of different conflict types on global trade flows. An estimable specification of the conventional gravity model of international trade, which can be formally derived from a general equilibrium model of trade, production and consumption as in Anderson and Van Wincoop (2003), is used. The ppml estimator requires an estimation with the dependent variable in levels and continuous regressors in logs (equation (1)). Accordingly, regression equation (1) is given by

$$X_{ij,t} = \exp\left[\beta_1 \text{conflict}_{ij,t} + \beta_2 \text{location}_{ij,t} + \beta_3 \text{neighbor}_{ij,t} + \beta_4 \text{both}_{ij,t} + \beta_5 \text{enemy}_{ij,t} + \beta_9 \log(\text{dist}_{ij,t}) + \beta_{10} \text{pta}_{ij,t} + \omega_{i,t} + \rho_{j,t} + \mu_{ij}\right] + \epsilon_{ij,t} \quad (1)$$

where i and j denote exporter and importer country, t denotes time, and the other variables are defined as:

$X_{ij,t}$ is the total trade value exported from origin i to destination j at time t ;
 $\text{conflict}_{ij,t}$ is a dummy being unity if i or j have been involved in the respective conflict at time t ;

$location_{ij,t}$ is a dummy being unity if i or j have been location of the respective conflict at time t ;
 $neighbor_{ij,t}$ is a dummy being unity if the neighbor of i or j has been involved in a conflict at time t ;
 $both_{ij,t}$ is a dummy being unity if both, i and j , have been involved in the respective conflict at time t ;
 $enemy_{ij,t}$ is a dummy being unity if i and j have been enemies in the respective conflict at time t ;
 $dist_{ij,t}$ is measuring the population-weighted distance between i and j at time t ;
 $pta_{ij,t}$ is a dummy variable being unity if a preferential trade agreement exists at time t ;
 $\omega_{i,t}$ and $\rho_{j,t}$ represent the exporter-time and importer-time fixed effects;
 μ_{ij} are the country-pair fixed effects, and
 $\epsilon_{ij,t}$ is the error term, taking up all other influences on dyadic trade.

Regression equation (1) is estimated for each of the five conflict types. $location_{ij,t}$ is only added to the estimation where the conflict type itself does not include this information: As described in Section 1.2, *internal armed conflict*, *non-state conflict* and *one-sided violence* per se take place within the country involved in the conflict. For the conflict categories *interstate armed conflict* and *internationalized internal armed conflict*, where more countries can be involved than only the country where the fighting takes place, the dummy was added. $neighbor_{ij,t}$ controls for a minimal (or relaxed) definition of conflict involvement: it only indicates whether the neighbor is involved in a conflict. $neighbor_{ij,t}$ does not indicate in which conflict type the neighbor is involved in, the number of conflicts the neighbor is involved in or whether or not the neighboring country is the location of a conflict.

Both, distance as well as preferential trade agreements, are time-variant country-pair variables and thus not removed by the high-dimensional fixed effects. Other commonly used control variables in gravity equations (such as e.g. national income measured as GDP and contiguity) and in the study of trade and conflict (as e.g. the level of democracy) are either time-variant country-level or time-invariant country-pair level variables. The applied high-dimensional fixed effects control for these characteristics.

1.4 Results

Overview tables for each conflict type with results from all specifications (A), (B), (C) and (D) can be found in the Appendix (Tables A.2 - A.6). The R^2s in these tables support the choice of the preferred specification (D) which displays the best model fit. Table 2 shows regression results for each conflict type for specification (D). Main results from the regressions are as follows.

Table 2: Results for specification (4): ppml with high-dimensional fixed effects

dep variable: exports	Interstate armed conflict	Internal armed conflict	Intern. internal armed conflict	Non-state conflict	One-sided violence
i or j in conflict	-0.0397*** (0.011)	0.1251*** (0.017)	0.1106*** (0.007)	0.0086 (0.012)	0.0500*** (0.010)
i or j conflict location	-0.2774*** (0.036)		-0.0938*** (0.028)		
i or j have neighbor in conflict	0.0006 (0.008)	0.0017 (0.008)	0.0044 (0.008)	-0.0000 (0.008)	0.0001 (0.008)
both in conflict	-0.0298 (0.022)	0.3187*** (0.038)	0.1270*** (0.008)	0.0491 (0.045)	0.0282 (0.036)
Enemies	-0.1540 (0.252)		-0.4728*** (0.137)		
ln distance	0.0012 (0.005)	-0.0005 (0.005)	0.0012 (0.005)	0.0034 (0.005)	0.0049 (0.005)
Preferential trade arrangement	0.0304*** (0.009)	0.0364*** (0.009)	0.0405*** (0.009)	0.0317*** (0.009)	0.0372*** (0.009)
Observations	400,584	400,584	400,584	400,584	400,584
R ²	0.973	0.972	0.975	0.973	0.972

Estimation with Importer-year, Exporter-year, and Country-pair fixed effects. Robust standard errors in parentheses.
* p<0.1, ** p<0.05, *** p<0.01 indicate statistical significance at the 10, 5, and 1 percent level, respectively.

Impact of exporter or importer being in conflict

First, only *interstate armed conflict* impacts negatively and significantly on international trade, reducing trade flows by $e^{-0.0397} - 1 = -3.9\%$. This negative effect is robust across all other specifications except ols hdfs where it is negative but not significant (see Table A.2). Second, all other conflict types impact positively and significantly on international trade except for *non-state conflict*, where the result is positive but not significant. The presence of an *internal armed conflict* displays the highest positive impact on trade (11.8%), followed by *internationalized internal armed conflict* (10.5%) and *one-sided violence* (4.8%). Note that this finding is not robust for the other specifications: ols estimations display negative effects for all conflict types on trade (except for *internationalized internal armed conflict* and *one-sided violence* in the ols hdfs-specification where the results are not significant). Surprisingly, the “classic” ppml-specification with country-time fixed effects shows a trade reduction of $\approx 99\%$ for each conflict type. Third, being the location of an *interstate armed conflict* additionally decreases trade by 24.2%, and being the location of an *internationalized internal armed conflict* has as well a negative and significant effect (-8.9%). Only the latter result is robust across all specifications (see Table A.4), while the result for *interstate armed conflict* is only robust in the ppml specifications (see Table A.2). Note that the other conflict types imply by definition also the conflict location). Fourth, if the importer or exporter have a neighbor in conflict their trade is not affected: estimates are positive, but very small and not significant. This result is robust across conflict types but only for the hdfs-specifications.

Impact of both being involved in a conflict

Generally, the “both in conflict”-specification should resemble the results from the “i or j”-specification, although magnitude and significance might differ since the cases where both countries in the trading dyad are involved in the same conflict type are expected to be fewer compared to those where only exporter or importer are involved. Overall, the results show these expected similarities: First, if both countries are involved in an *interstate armed conflict* trade is affected negatively but not significantly, with the negative result being robust across all specifications. Second, *internal armed conflict* and *internationalized internal armed conflict* display a positive impact on international trade by 27.3% and 11.9% respectively. The result for *internationalized internal armed conflict* is robust for the hdfs-specifications, while *internal armed conflict* displays positive and high results in all other specifications. *One-sided violence* and *non-state conflict* display positive but not significant estimates, which are robust only for the hdfs specifications in the former, and only for ppml hdfs in the latter case. If both countries were involved in the same *internationalized internal armed conflict* and were enemies, trade is decreased by 37.7%. This high negative effect is robust across all specifications. For *interstate armed conflict*, the result is negative but not significant. In this case, ctf specifications yield high negative and significant effects, while ols hdfs yields a positive but not significant result.

Control variables

In the ppml hdfe specification, only two control variables are included: distance and preferential trade agreements. While distance does not have a significant effect in this specification, preferential trade agreements have a positive and highly significant effect across all conflict types and across all specifications except for ppml ctfe, where the estimate is negative and high. For distance the result is unique compared to other specifications: For ols and ppml with ctfe the effects are negative, significant and high. For ols hdfe the estimate is positive and significant.

1.5 Discussion

The negative impact of *interstate armed conflict* appears to be robust to the removal of all dyadic heterogeneity by hdfe. Overall, the obtained result is in line with previous findings from the literature, although the impact is much less severe than e.g. the trade decreasing effect of interstate dispute found by Martin et al. (2008) of 22%, but closer to the result of Blomberg & Hess (2006) who found a negative but not significant effect of external wars on trade. Considering the overall low number of *interstate armed conflict* events (see Table A.10) in comparison to the other conflict types, the still significant and negative effect on trade matches the assumption made above that *interstate armed conflict* is especially destructive in terms of production factors and trade relations. This argument is furthermore supported by the additional high negative impact implied when being location of an *interstate armed conflict*. As aforementioned, this conflict type appears always simultaneously with other conflict types. Thus, the question remains how much of the effect of other conflict types on trade might be picked up by the effect of *interstate armed conflict*. This simultaneity in appearance of conflict types is, however, as well true for *internal armed conflict* and *one-sided violence*, which show positive effects on trade flows. These results, as well as the positive effect of *internationalized internal armed conflict* on trade, are contrary to previous findings which provided evidence for negative effects of internal wars and other forms of violence (Blomberg and Hess, 2006; Marano et al., 2013). *Internationalized internal armed conflict* is a special case: First, it displays an *internal armed conflict* where external governments are involved, often so via cases such as NATO's mutual defense clause. Second, the majority of countries involved in this group are not location of the conflict – in contrast to *internal armed conflict* and *one-sided violence* - which is mirrored by the results: once a country in a trading dyad is location of an *internationalized internal armed conflict*, the impact on trade is negative and significant. Additionally, the countries that are not location of an *internationalized internal armed conflict* but involved in such a conflict are by the majority western states such as the US or European countries. The positive effect of an *internationalized internal armed conflict* on trade might be driven precisely by these countries which profit from their involvement in conflict by increased trade in e.g. munitions but also other supplies to troops. Furthermore, the positive result for both trading partners being involved in an *internationalized internal armed conflict* might

provide evidence supporting earlier findings that alliances trade more (Gowa and Mansfield, 1993).

The positive effects of *internal armed conflict* and *one-sided violence* on trade are much more staggering and allow for several possible interpretations. First, both conflict types include government involvement. Thus, increased trade levels could be due to increased demand for conflict goods supplied by the government as in the case of *internationalized internal armed conflict*. However, as these conflict types are purely internal, a closer look has to be taken onto the characteristics of the countries affected. As Cali (2014) demonstrates, countries in internal conflict often display a high dependence on primary export commodities and a low diversification in terms of production. The dependent variable in this analysis is the value of total exports. When a country is hit by conflict a reduction in production quantities may lead to increased prices. This is not only true for the country in conflict, but as well for trading partners who have to import higher priced commodities from other countries. Thus, the traded value might increase, although the traded quantity decreases or stagnates. In turn, what is mirrored in the estimates might not be the suspected negative influence of conflict on production factors, but rather the shortage following these impacts and the associated market reactions (see e.g. Garfinkel et al., 2008, for a discussion of oil-dependent countries and internal conflict).

For the conflict types *interstate armed conflict* and *internationalized internal armed conflict* the additional effect of being the location of the conflict is estimated and a negative and significant effect on trade is found for both. Since the other conflict types - that are per definition conflict locations - displayed overall increases in trade, no statement can be made on the impact of being location for these types of conflict. The fact that being the location of an *interstate armed conflict* impacts on trade much more severely than solely being involved in such a conflict is a revealing result: with the exception of Marano et al. (2013), previous studies that examined the effect of those types of conflicts did not control for the location of conflict. Thus, some of the high negative effects found might be picking up this location effect. Moreover, this study cannot confirm earlier findings on negative spillover-effects (Couttenier and Vicard, 2011; Marano et al., 2013; Qureshi, 2013) of a neighbor in conflict. The results from the internal conflict types and from the neighbor in conflict variable suggest that the effect of being the location of a conflict depends on the conflict type.

The case where both trading partners are primary conflict parties in a conflict and enemies overall presents the most tremendous decrease in trade of 37.7% for *internationalized internal armed conflict*. This is very revealing especially in the context of *internationalized internal armed conflict*, where a lot of external states are involved in an internal conflict. Being location of an *internationalized internal armed conflict* is also negative for trade, but the effect is smaller than the enmity

effect. Furthermore, if two states are involved in the conflict but are not enemies, this actually yields an increase in trade. For *interstate armed conflict*, the effect of being conflict location seems to be more important than being enemies. The results are in line with the findings on rivalry from e.g. Long (2008), however, especially the results for *internationalized internal armed conflict* are novelty since, to the authors knowledge, no study on trade and conflict before included this conflict type.

Does government involvement matter for the magnitude of the effect of conflict on trade? For *non-state conflict* - the only conflict type where no governments are involved - overall no significant results are found (except for the control variable preferential trade agreements). It has to be noted that for *non-state conflict* the lowest numbers of battle-related deaths are reported. This points towards another possible interpretation: differences in the destruction of human capital could drive variation in the impacts of the different conflict types. However, this interpretation can be partly dismissed because the conflict types with the highest numbers of battle-related deaths - *internal armed conflict* and *one-sided violence* - also have a positive impact on trade. Nevertheless, a combination of both – low numbers of battle-deaths and no governmental involvement – lead to no effects for exports in the *non-state conflict* case. All other conflict types involve governments and display significant positive as well as significant negative results. Thus, it can be stated that government involvement in conflict matters for trade, but it does not necessarily have a negative effect.

Overall, estimated coefficients of the ppml hdfs specification are smaller in magnitude than results from other estimators. Moreover, the ppml panel estimator yields significant results when applying hdfs. For some conflict types, this is as well the case for the ols hdfs specification. However, the signs in these cases are reversed. Interestingly, the inclusion of country-pair fixed effects changes the results between the two ols specifications: There is no obvious pattern visible in these changes, as a lot of switches in sign and significance occur. However, overall the magnitude of the effects is reduced by the inclusion of country-pair fixed effects. A similar difference is visible between the ppml specifications. The “classic” ppml-specification with only country-time fixed effects shows a trade reduction of $\approx 99\%$ for each conflict type. The difference between these results and the ppml hdfs-specification is striking. Country-pair heterogeneity thus seems to yield important information driving the ppml and ols cdfs specification results. The R^2 s support the notion that country-pair heterogeneity should be accounted for, as the hdfs specifications display the better fit compared to the cdfs specifications. Moreover, the goodness-of-fit as well as the Breusch-Pagan-Test results support controlling for heteroscedasticity by the use of the ppml estimator. The results for the control variable distance supports the finding by Santos Silva and Tenreyro (2006), namely that the role of geographic characteristics is overestimated by ols. In contrary, the effect of preferential trade agreements is robust to the removal of all country-pair and country-time heterogeneity. Hence, even

in times of conflict, preferential trade agreements have a positive effect on trade.

1.6 Conclusion

This paper estimates the effects of different types of conflict on trade by using a ppml hufe approach. Major findings are that solely *interstate armed conflict* impacts negatively on exports, while *internal armed conflict*, *internationalized internal armed conflict* and *one-sided violence* have a positive effect on trade flows. However, being location of an *interstate armed conflict* or an *internationalized internal armed conflict* impacts negatively and significantly on trade. Additionally, enmity between trading states has a large negative effect when the countries are rivals in an *internationalized internal armed conflict*.

This paper provides evidence that the study of trade and conflict should account for the heterogeneity of conflict types and their distinct characteristics. Attributes like the location of conflict and actors involved matter for the direction of impact on trade. Especially the increasing number of *internationalized internal armed conflicts* and the striking result of a 37.7% trade reduction between enemies in such a conflict as well as the trade-increasing effects of internal conflict types need to be considered in further studies. The biggest strength of the ppml hufe estimator is the biggest caveat at the same: the high-dimensional fixed effects control for a lot of variation that might be helpful in understanding differences in the results.

The variation in results complicates the determination of policy implications. Increasing trade volumes in times of conflict might not reflect the damages emanating from conflict and might cover-up actual welfare-effects. Understanding the mechanisms behind why some conflicts diverge or destroy trade and some seem to have a trade-increasing effect is a desirable direction of future research. Studies will have to focus on single countries or sectors to understand how conflict impacts on economic welfare and how or if this translates into changes in trade volumes. Hence, disaggregated studies looking more closely at sector-level changes will be valuable to complement time-series cross section analyses. Country case studies focusing on the effect of different conflict types on production factors could as well contribute to understanding variation in impact and magnitude of often simultaneously appearing conflict types.

REFERENCES

- Abadie, A. and Gardeazabal, J. (2003). The Economic Costs of Conflict: A Case Study of the Basque Country. *American Economic Review*, 93(1):113–132.
- Anderson, J. E. and Van Wincoop, E. (2003). Gravity with Gravitas: A Solution to the Border Puzzle. *The American Economic Review*, 93(1):170–192.
- Anderton, C. and Carter, J. (2009). *Principles of Conflict Economics: A Primer for Social Scientists*. Cambridge University Press, Cambridge, MA.
- Anderton, C. H. (2003). Conflict and trade in a predator/prey economy. *Review of Development Economics*, 7(1):15–29.
- Anderton, C. H., Barbieri, K., Beck, N., Carter, J. R., Dorussen, H., Gartzke, E., Gissinger, R., Gleditsch, N. P., Hegre, H., Levy, J. S., Li, Q., Mansfield, E. D., Morrow, J. D., Oneal, J. R., Pevehouse, J. C., Polacheck, S. W., Reuveny, R., Russett, B., Schneider, G., Schulze, G. G., and Weede, E. (2003). *Globalization and Armed Conflict*. Rowman & Littlefield, Oxford.
- Anderton, C. H. and Carter, J. R. (2001). The impact of war on trade: An interrupted times-series study. *Journal of Peace Research*, 38(4):445–457.
- Baier, S. L. and Bergstrand, J. H. (2007). Do free trade agreements actually increase members' international trade? *Journal of International Economics*, 71(1):72–95.
- Baldwin, R. and Taglioni, D. (2006). Gravity for Dummies and Dummies for Gravity Equations. *NBER Working Paper*, (12516).
- Baldwin, R. and Taglioni, D. (2007). Trade Effects of the Euro: a Comparison of Estimators. *Journal of Economic Integration*, 22:780–818.
- Barbieri, K. and Levy, J. S. (1999). Sleeping with the Enemy: The Impact of War on Trade. *Journal of Peace Research*, 36(4):463–479.
- Barbieri, K. and Reuveny, R. (2005). Economic Globalization and Civil War. *The Journal of Politics*, 67(4):1228–1247.
- Bayer, R. and Rupert, M. C. (2004). Effects of Civil Wars on International Trade, 1950–92. *Journal of Peace Research*, 41(6):699–713.
- Benson, M. A. (2005). The Relevance of Politically Relevant Dyads in the Study of Interdependence and Dyadic Disputes. *Conflict Management and Peace Science*, 22(2):113–133.

- Blomberg, S. B. and Hess, G. D. (2002). The Temporal Links between Conflict and Economic Activity. *Journal of Conflict Resolution*, 46(1):74–90.
- Blomberg, S. B. and Hess, G. D. (2006). How Much Does Violence Tax Trade? *Review of Economics and Statistics*, 88(4):599–612.
- Boese, V. A. and Kamin, K. (2019). 'Tis but thy name that is my enemy: On the construction of macro panel datasets in conflict and peace economics. *The Economics of Peace and Security Journal*, 14(1):5–23.
- Calì, M. (2014). Trading away from conflict: using trade to increase resilience in fragile states. *The World Bank*.
- Carmignani, F. and Kler, P. (2016). Surrounded by wars: Quantifying the role of spatial conflict spillovers. *Economic Analysis and Policy*, 49:7–16.
- Chang, Y. C., Polachek, S. W., and Robst, J. (2004). Conflict and trade: The relationship between geographic distance and international interactions. *Journal of Socio-Economics*, 33(4):491–509.
- Chauvin, N. D. and Rohner, D. (2009). The Effects of Conflict on the Structure of the Economy. In *Proceedings of the German Development Economics Conference, Frankfurt aM 2009*, number 6. Verein für Socialpolitik, Research Committee Development Economics.
- Collier, P. (1999). On the Economic Consequences of Civil War. *Oxford Economic Papers*, 51(1):168–183.
- Collier, P. (2003). *Breaking the Conflict Trap*. The World Bank.
- Correia, S. (2016). REGHDFE: Stata Module to Perform Linear or Instrumental- Variable Regression Absorbing Any Number of High-Dimensional Fixed Effects.
- Correlates of War Project. Direct Contiguity Data, 1816-2016. Version 3.2. (2016).
- Couttenier, M. and Vicard, V. (2011). Trade and income: using civil wars in transit countries as external shocks on trade.
- De Groot, O. J. (2010). The Spillove Effects of Conflict on Economic Growth in Neighbouring Countries in Africa. *Defence and Peace Economics*, 21(2):149–164.
- Donaldson, D. (2018). Railroads of the Raj: Estimating the Impact of Transportation Infrastructure. *American Economic Review*, 108(4-5):899–934.
- Eck, K. and Hultman, L. (2007). One-Sided Violence Against Civilians in War. *Journal of Peace Research*, 44(2):233–246.

- Eichengreen, B. and Irwin, D. A. (1995). Trade blocs, currency blocs and the reorientation of world trade in the 1930s. *Journal of International Economics*, 38(1-2):1–24.
- Eichengreen, B. and Irwin, D. A. (1997). The Role of History in Bilateral Trade Flows. In Frankel, J. A., editor, *The Regionalization of the World Economy*. University of Chicago Press, Chicago.
- Felbermayr, G. J. and Kohler, W. (2006). Exploring the intensive and extensive margins of world trade. *Review of World Economics*.
- Garfinkel, M. R., Skaperdas, S., and Syropoulos, C. (2008). Globalization and domestic conflict. *Journal of International Economics*, 76(2):296–308.
- Gleditsch, N. P., Wallensteen, P., Eriksson, M., Sollenberg, M., and Strand, H. (2002). Armed Conflict 1946–2001: A New Dataset. *Journal of Peace Research*, 39(5):615–637.
- Glick, R. and Rose, A. K. (2002). Does a currency union affect trade? The time-series evidence. *European Economic Review*, 46(6):1125–1151.
- Glick, R. and Taylor, A. M. (2010). Collateral Damage: Trade Disruption and the Economic Impact of War. *Review of Economics and Statistics*, 92(1):102–127.
- Gowa, J. and Mansfield, E. D. (1993). Power Politics and International Trade. *American Political Science Review*, 87(2):408–420.
- Guidolin, M. and La Ferrara, E. (2007). Diamonds Are Forever, Wars Are Not: Is Conflict Bad for Private Firms? *American Economic Review*, 97(5):1978–1993.
- Head, K. (2003). Gravity for Beginners. *Rethinking the Line: The Canada-U.S. Border Conference*, (January):1–11.
- Head, K. and Mayer, T. (2000). Non-Europe: The Magnitude and Causes of Market Fragmentation in the EU. *Review of World Economics*, 136(2):284–314.
- Head, K. and Mayer, T. (2014). Gravity Equations: Workhorse, Toolkit, and Cookbook. *Handbook of International Economics*, 4:131–195.
- Hegre, H. (2014). Democracy and armed conflict. *Journal of Peace Research*, 51(2):159–172.
- Hegre, H. (2018). Development and the Liberal Peace : What Does It Take to Be a Trading State? *Journal of Peace Research*, 37(1):5–30.
- Hegre, H., Oneal, J. R., and Russett, B. (2010). Trade does promote peace: New simultaneous estimates of the reciprocal effects of trade and conflict. *Journal of Peace Research*, 47(6):763–774.

- Jones, D. M., Bremer, S. A., and Singer, J. D. (1996). Militarized Interstate Disputes, 1816–1992: Rationale, Coding Rules, and Empirical Patterns. *Conflict Management and Peace Science*, 15(2):163–213.
- Keshk, O. M., Reuveny, R., and Pollins, B. M. (2010). Trade and conflict: Proximity, country size, and measures. *Conflict Management and Peace Science*, 27(1):3–27.
- Kreutz, J. (2008). UCDP One-sided Violence Codebook. *Journal Of Peace Research*, (2005):1–4.
- Larch, M., Wanner, J., Yotov, Y. V., and Zylkin, T. (2018). Currency Unions and Trade: A PPML Re-assessment with High-dimensional Fixed Effects. *Oxford Bulletin of Economics and Statistics*.
- Lemke, D. and Reed, W. (2001). The Relevance of Politically Relevant Dyads. *Journal of Conflict Resolution*, 45(1):126–144.
- Levy, J. S. (2007). International Sources of Interstate and Intrastate War. In *In C. A. Crocker, F. O. Hampson, and P. Aall, eds., Leashing the Dogs of War: Conflict Management in a Divided World. Washington, DC: United States*, pages 17–38.
- Li, Q. and Reuveny, R. (2011). Does trade prevent or promote interstate conflict initiation? *Journal of Peace Research*, 48(4):437–453.
- Long, A. G. (2008). Bilateral Trade in the Shadow of Conflict. *International Studies Quarterly*, 52(1):81–101.
- Mansfield, E. D. and Bronson, R. (1997). Alliances, Preferential Trading Arrangements, and International Trade. *American Political Science Review*, 91(1):94–107.
- Mansfield, E. D. and Pevehouse, J. C. (2000). *Trade Blocs, Trade Flows, and International Conflict*, volume 54.
- Marano, V., Cuervo-Cazurra, A., and Kwok, C. C. (2013). The Impact of Conflict Types and Location on Trade. *International Trade Journal*, 27(3).
- Martin, P., Mayer, T., and Thoenig, M. (2008). Make trade not war? *Review of Economic Studies*, 75(3):865–900.
- Morrow, J. D., Siverson, R. M., and Tabares, T. E. (1999). Correction to “The Political Determinants of International Trade”. *American Political Science Review*, 93(04):931–933.
- Murdoch, J. C. and Sandler, T. (2002). Economic Growth, Civil Wars, and Spatial Spillovers. *Journal of Conflict Resolution*, 46(1):91–110.

- Nordhaus, W. D. (2002). The Economic Consequences of a War with Iraq. In Kaysen, C., Miller, S. E., Malin, M. B., Nordhaus, W. D., and Steinbruner, J. D., editors, *War with Iraq: Costs, Consequences, and Alternatives* — Belfer Center for Science and International Affairs, chapter 3, pages 1–93. American Academy of Arts & Sciences.
- O’Neal, J. R. and Russett, B. M. (1999). Assessing the Liberal Peace with Alternative Specifications: Trade Still Reduces Conflict. *Journal of Peace Research*, 36(4):423–442.
- Petterson, T. and Eck, K. (2018). Organized violence, 1989–2017. *Journal of Peace Research*, 55(4):535–547.
- Polachek, S. W. (1980). Conflict and trade. *Journal of Conflict Resolution*, 24(1):55–78.
- Polachek, S. W., Robst, J., and Chang, Y.-C. (1999). Liberalism and Interdependence: Extending the Trade-Conflict Model. *Journal of Peace Research*, 36(4):405–422.
- Polachek, S. W. and Seiglie, C. (2007). Trade, Peace and Democracy: An Analysis of Dyadic Dispute. In *Handbook of Defense Economics*, pages 1017–1073.
- Pollins, B. M. (1989). Conflict, Cooperation, and Commerce: The Effect of International Political Interactions on Bilateral Trade Flows. *American Journal of Political Science*, 33(3):737–761.
- Qureshi, M. S. (2013). Trade and thy neighbor’s war. *Journal of Development Economics*, 105:178–195.
- Reuveney, R. and Kang, H. (1996). International Trade, Political Conflict/Cooperation, and Granger Causality. *American Journal of Political Science*, 40(3):943–70.
- Rohner, D., Thoenig, M., and Zilibotti, F. (2013). War signals: A theory of trade, trust, and conflict. *Review of Economic Studies*, 80(3):1114–1147.
- Rose, A. K. (2004). Do We Really Know That the WTO Increases Trade? *American Economic Review*, 94(1):98–114.
- Russett, B. M. and Oneal, J. R. (2001). *Triangulating peace : democracy, interdependence, and international organizations*. Norton.
- Santos Silva, J. M. C. and Tenreyro, S. (2006). The Log of Gravity. *Review of Economics and Statistics*, 88(4):641–658.
- Stewart, F. and Fitzgerald, V. (2000). *War and Underdevelopment*. Oxford University Press.
- Stinnett, D. M., Tir, J., Schafer, P., Diehl, P. F., and Gochman, C. (2002). The Correlates of War Project Direct Contiguity Data, Version 3. *Conflict Management and Peace Science*, 19(2):58–66.

- Sundberg, R., Eck, K., and Kreutz, J. (2012a). Introducing the UCDP Non-State Conflict Dataset. *Journal of Peace Research*, 49(2):351–362.
- Sundberg, R., Eck, K., and Kreutz, J. (2012b). UCDP Non-State Conflict Codebook Version 2.5-2014. (49):351–362.
- The Gravity database (2015). *Centre d'Études Prospectives et d'Informations Internationales*.
- The World Bank (2017). *The Toll of War: The Economic and Social Consequences of the Conflict in Syria*. World Bank.
- Themnér, L. and Wallensteen, P. (2014). Armed Conflict, 1946-2013. *Journal of Peace Research*, 51(4).
- Tinbergen, J. (1962). Shaping the World Economy; Suggestions for an International Economic Policy.
- UCDP Battle-Related Death dataset version 18.1 (2017).
- UCDP/PRIO (2014). UCDP/PRIO Armed Conflict Dataset Codebook. Version 4:1–22.
- UN Comtrade Database (2008). *United Nations Statistical Office*.
- Uppsala Conflict Data Program (2014). *Department of Peace and Conflict Research - Uppsala Universitet*.
- Vicard, V. (2008). Trade, Conflicts and Political Integration: Explaining the Heterogeneity of Regional Trade Agreements. *European Economic Review*, 56(1):54–71.
- World Development Indicators (2013). *The World Bank*, 35(03):35–1297.
- Zylkin, T. (2017). PPML_PANEL_SG: Stata Module to Estimate “Structural Gravity” Models via Poisson PML.

Appendix

A.1 Data adjustments

When merging economic data with policy variables such as conflict, good care has to be taken to not lose observations due to country naming inconsistencies (see Boese and Kamin (2019) for an extensive discussion). The following country names from the conflict data were adapted to the country names in the trade data to make them compatible: “Bosnia-Herzegovina” in “Bosnia and Herzegovina”, “Cambodia (Kampuchea)” in “Cambodia”, “DR Congo (Zaire)” in “Congo, Dem. Rep.”, “Ivory Coast” in “Cote d’Ivoire”, “Korea” in “Korea, Rep.”, “Kyrgyzstan” in “Kyrgyz Republic”, “Laos” in “Lao PDR”, “Macedonia” in “Macedonia (FYR)”, “Madagascar (Malagasy)” in “Madagascar”, “Myanmar (Burma)” in “Myanmar”, “Russia” in “Russian Federation”, “Slovakia” in “Slovak Republic”, “Syria” in “Syrian Arab Republic”, “United States of America” in “United States”, “Yemen (North Yemen)” in “Yemen”, “Serbia (Yugoslavia)” in “Yugoslavia”, “Zimbabwe (Rhodesia)” in “Zimbabwe”. A special case is Ethiopia: As location, “Ethiopia” is coded since 1992 in the conflict data, “Eritrea” since 1997. In the trade data “Eritrea” is coded since 1993, “Ethiopia (incl. Eritrea)” only in 1992, “Ethiopia (excl. Eritrea)” since 1993. UCDP coincides with the list of UN member states where Eritrea is only coded from 1993 on. Hence, for 1992 Ethiopia was renamed “Ethiopia (incl. Eritrea)” and from 1993 on “Ethiopia (excl. Eritrea)” in accordance with the trade data. Within the trade data another pitfall in country naming has to be addressed: “Czechoslovakia” exists in the trade data only for the year 1992. From 1993 on the country is divided in “Czech Republic” and “Slovak Republic”. Since there are no conflict observations for these countries in these years, the naming remained as is. Furthermore, the *internal armed conflict* in South Sudan in 2011 and the *internationalized internal armed conflict* in Lesotho in 1998 are not included due to missing trade data.

A.2 Alternative specifications / robustness checks

A.2.1 Estimation of ols with country-time fixed effects

$$\begin{aligned}
 \ln(X_{ij,t}) = & \beta_0 + \beta_1 \text{conflict}_{ij,t} + \beta_2 \text{location}_{ij,t} + \beta_3 \text{neighbor}_{ij,t} \\
 & + \beta_4 \text{both}_{ij,t} + \beta_5 \text{enemy}_{ij,t} + \beta_6 \log(\text{dist}_{ij,t}) + \beta_7 \text{pta}_{ij,t} \\
 & + \beta_8 \text{contiguity}_{ij} + \beta_9 \text{comlang}_{ij} + \beta_{10} \text{colony}_{ij} + \beta_{11} \text{comcol}_{ij} \\
 & + \omega_{i,t} + \rho_{j,t} + \epsilon_{ij,t}
 \end{aligned} \tag{2}$$

where i and j denote exporter and importer country, t denotes time, and the other variables are defined as:

$X_{ij,t}$ is the logged total trade value exported from origin i to destination j at time t ;
 $\text{conflict}_{ij,t}$ is a dummy being unity if i or j have been involved in the respective conflict at time t ;
 $\text{location}_{ij,t}$ is a dummy being unity if i or j have been location of the respective conflict at time t ;
 $\text{neighbor}_{ij,t}$ is a dummy being unity if the neighbor of i or j has been involved in a conflict at time t ;
 $\text{both}_{ij,t}$ is a dummy being unity if both, i and j , have been involved in the respective conflict at time t ;
 $\text{enemy}_{ij,t}$ is a dummy being unity if i and j have been enemies in the respective conflict at time t ;
 $\text{dist}_{ij,t}$ is measuring the population-weighted distance between i and j at time t ;
 $\text{pta}_{ij,t}$ is a dummy variable being unity if a preferential trade agreement exists at time t ;
 contiguity_{ij} is a dummy variable being unity if i and j share a common border;
 comlang_{ij} is a dummy variable being unity if i and j have a common official language;
 colony_{ij} is a dummy variable being unity for pairs that have had a colonial relationship in the past;
 comcol_{ij} is a dummy variable being unity for having a common colonizer past 1945;
 $\omega_{i,t}$ and $\rho_{j,t}$ represent the exporter-time and importer-time fixed effects;
 $\epsilon_{ij,t}$ is the error term, taking up all other influences on dyadic trade.

A.2.2 Estimation of ols with high-dimensional fixed effects

$$\begin{aligned}
 \ln(X_{ij,t}) = & \beta_0 + \beta_1 \text{conflict}_{ij,t} + \beta_2 \text{location}_{ij,t} + \beta_3 \text{neighbor}_{ij,t} + \beta_4 \text{both}_{ij,t} + \\
 & \beta_5 \text{enemy}_{ij,t} + \beta_6 \log(\text{dist}_{ij,t}) + \beta_7 \text{pta}_{ij,t} + \omega_{i,t} + \rho_{j,t} + \mu_{ij} + \epsilon_{ij,t}
 \end{aligned} \tag{3}$$

where i and j denote exporter and importer country, t denotes time, and the other variables are defined as:

$\ln(X_{ij,t})$ is the logged total trade value exported from origin i to destination j at time t ;
 $\text{conflict}_{ij,t}$ is a dummy being unity if i or j have been involved in the respective conflict at time t ;
 $\text{location}_{ij,t}$ is a dummy being unity if i or j have been location of the respective conflict at time t ;

$neighbor_{ij,t}$ is a dummy being unity if the neighbor of i or j has been involved in a conflict at time t;
 $both_{ij,t}$ is a dummy being unity if both, i and j, have been involved in the respective conflict at time t;

$enemy_{ij,t}$ is a dummy being unity if i and j have been enemies in the respective conflict at time t;

$dist_{ij,t}$ is measuring the population-weighted distance between i and j at time t;

$pta_{ij,t}$ is a dummy variable being unity if a preferential trade agreement exists at time t;

$\omega_{i,t}$ and $\rho_{j,t}$ represent the exporter-time and importer-time fixed effects;

μ_{ij} are the country-pair fixed effects, and

$\epsilon_{ij,t}$ is the error term, taking up all other influences on dyadic trade.

A.2.3 Estimation of ppml with country-time fixed effects

$$\begin{aligned}
 X_{ij,t} = \exp & \left[\beta_1 conflict_{ij,t} + \beta_2 location_{ij,t} + \beta_3 neighbor_{ij,t} + \beta_4 both_{ij,t} + \right. \\
 & \beta_5 enemy_{ij,t} + \beta_6 \log(dist_{ij,t}) + \beta_7 pta_{ij,t} + \beta_8 contiguity_{ij} \\
 & \left. + \beta_9 comlang_{ij} + \beta_{10} colony_{ij} + \beta_{11} comcol_{ij} + \omega_{i,t} + \rho_{j,t} \right] \\
 & + \epsilon_{ij,t}
 \end{aligned} \tag{4}$$

where i and j denote exporter and importer country, t denotes time, and the other variables are defined as:

$X_{ij,t}$ is the total trade value exported from origin i to destination j at time t;

$conflict_{ij,t}$ is a dummy being unity if i or j have been involved in the respective conflict at time t;

$location_{ij,t}$ is a dummy being unity if i or j have been location of the respective conflict at time t;

$neighbor_{ij,t}$ is a dummy being unity if the neighbor of i or j has been involved in a conflict at time t;

$both_{ij,t}$ is a dummy being unity if both, i and j, have been involved in the respective conflict at time t;

$enemy_{ij,t}$ is a dummy being unity if i and j have been enemies in the respective conflict at time t;

$dist_{ij,t}$ is measuring the population-weighted distance between i and j at time t;

$pta_{ij,t}$ is a dummy variable being unity if a preferential trade agreement exists at time t;

$contiguity_{ij}$ is a dummy variable being unity if i and j share a common border;

$comlang_{ij}$ is a dummy variable being unity if i and j have a common official language;

$colony_{ij}$ is a dummy variable being unity for pairs that have had a colonial relationship in the past;

$comcol_{ij}$ is a dummy variable being unity for having a common colonizer past 1945;

$\omega_{i,t}$ and $\rho_{j,t}$ represent the exporter-time and importer-time fixed effects;

$\epsilon_{ij,t}$ is the error term, taking up all other influences on dyadic trade.

A.2.4 Results from all specifications, (1)-(4), per conflict type

Table A.1: Summary statistics for variables only used in the other specifications

Variable	Obs	Mean	Std. Dev.	Min	Max
ln(Exports)+1	417,211	7.349204	4.245883	0	30.33898
Contiguity	408,651	.021708	.1457286	0	1
Common official language	408,651	.161184	.367701	0	1
Colony	408,651	.0178294	.1323312	0	1
Common colonizer	408,651	.0959719	.294553	0	1

Table A.2: Results from all specifications for *interstate armed conflict*

dep variable:	ols ctfe (A)		ols hdfe (B)		ppml ctfe (C)		ppml hdfe (D)	
	In exports	In exports	In exports	In exports	exports	exports	exports	exports
i or j in conflict	-5.8710*** (0.570)	-0.1874 (0.260)	-0.1874 (0.260)	-9.8625*** (0.239)	-9.8625*** (0.239)	-0.0397*** (0.011)	-0.0397*** (0.011)	
i or j conflict location	0.8196** (0.405)	0.0883 (0.277)	0.0883 (0.277)	-2.0051*** (0.343)	-2.0051*** (0.343)	-0.2774*** (0.036)	-0.2774*** (0.036)	
i or j have neighbor in conflict	-0.2964*** (0.008)	0.0041 (0.007)	0.0041 (0.007)	-9.4284*** (0.073)	-9.4284*** (0.073)	0.0006 (0.008)	0.0006 (0.008)	
both in conflict	-11.2881*** (1.175)	-0.6876 (0.561)	-0.6876 (0.561)	-13.0725*** (0.470)	-13.0725*** (0.470)	-0.0298 (0.022)	-0.0298 (0.022)	
Enemies	-1.5899* (0.832)	0.2168 (0.642)	0.2168 (0.642)	-2.1332** (0.925)	-2.1332** (0.925)	-0.1540 (0.252)	-0.1540 (0.252)	
In distance	-1.4471*** (0.007)	0.0351*** (0.012)	0.0351*** (0.012)	-0.4186*** (0.140)	-0.4186*** (0.140)	0.0012 (0.005)	0.0012 (0.005)	
Preferential trade arrangement	0.3516*** (0.017)	0.0903*** (0.013)	0.0903*** (0.013)	-2.0598*** (0.386)	-2.0598*** (0.386)	0.0304*** (0.009)	0.0304*** (0.009)	
Contiguity	0.3624*** (0.029)			-2.3922*** (0.443)	-2.3922*** (0.443)			
Common official language	0.6064*** (0.015)			1.9425*** (0.191)	1.9425*** (0.191)			
Colonial link ever	1.1545*** (0.030)			-1.3923*** (0.338)	-1.3923*** (0.338)			
Common colonizer post-1945	0.7795*** (0.019)			2.4004*** (0.317)	2.4004*** (0.317)			
Observations	399,784	397,185	397,185	400,584	400,584	400,584	400,584	
R ²	0.669	0.914	0.914	0.701	0.701	0.973	0.973	

Results from all specifications for *interstate armed conflict*. "ctfe": Estimation with importer-year and exporter-year fixed effects. "hdfe": Estimation with importer-year, exporter-year and country-pair fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01 indicate statistical significance at the 10, 5, and 1 percent level, respectively.

Table A.3: Results from all specifications for *internal armed conflict*

dep variable:	ols ctfe		ols hdfe		ppml ctfe		ppml hdfe	
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
	In exports	In exports	exports	exports	In exports	In exports	exports	exports
i or j in conflict	-3.2240*** (0.140)	-0.1219*** (0.040)	-11.1333*** (0.109)	0.1251*** (0.017)				
i or j have neighbor in conflict	-0.2953*** (0.008)	0.0041 (0.007)	-9.3849*** (0.079)	0.0017 (0.008)				
both in conflict	-6.3451*** (0.283)	-0.2216*** (0.085)	-14.3118*** (0.305)	0.3187*** (0.038)				
In distance	-1.4438*** (0.007)	0.0345*** (0.013)	-0.4624*** (0.164)	-0.0005 (0.005)				
Preferential trade arrangement	0.3434*** (0.017)	0.0904*** (0.013)	-2.3678*** (0.440)	0.0364*** (0.009)				
Contiguity	0.3528*** (0.029)		-2.8576*** (0.475)					
Common official language	0.6090*** (0.015)		2.0722*** (0.198)					
Colonial link ever	1.1541*** (0.029)		-1.7686*** (0.372)					
Common colonizer post-1945	0.7853*** (0.019)		2.9706*** (0.275)					
Observations	399,784	397,185	400,584	400,584				
R ²	0.673	0.914	0.704	0.972				

Results from all specifications for *internal armed conflict*. "ctfe": Estimation with importer-year and exporter-year fixed effects. "hdfe": Estimation with importer-year, exporter-year and country-pair fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01 indicate statistical significance at the 10, 5, and 1 percent level, respectively.

Table A.4: Results from all specifications for *internationalized internal armed conflict*

dep variable:	ols ctfe (A)		ols hdfe (B)		ppml ctfe (C)		ppml hdfe (D)	
	In exports	In exports	In exports	In exports	exports	exports	exports	exports
i or j in conflict	-3.3601*** (0.101)	-0.0048 (0.019)	-10.4284*** (0.070)	0.1106*** (0.007)				
i or j conflict location	-1.8610*** (0.375)	-0.0249 (0.091)	-3.0445*** (0.530)	-0.0938*** (0.028)				
i or j have neighbor in conflict	-0.2777*** (0.008)	0.0038 (0.007)	-8.9502*** (0.101)	0.0044 (0.008)				
both in conflict	-6.6233*** (0.204)	0.0671* (0.039)	-11.0822*** (0.092)	0.1270*** (0.008)				
Enemies	-1.2943*** (0.286)	-0.4677** (0.232)	-0.7897 (1.013)	-0.4728*** (0.137)				
In distance	-1.4457*** (0.007)	0.0350*** (0.012)	-0.5987*** (0.106)	0.0012 (0.005)				
Preferential trade arrangement	0.3898*** (0.017)	0.0877*** (0.013)	-2.1190*** (0.343)	0.0405*** (0.009)				
Contiguity	0.3417*** (0.029)		-1.6422*** (0.464)					
Common official language	0.6037*** (0.015)		0.9388*** (0.209)					
Colonial link ever	1.1802*** (0.029)		-1.3900*** (0.408)					
Common colonizer post-1945	0.7444*** (0.019)		1.1150*** (0.276)					
Observations	399,784	397,185	400,584	400,584				
R ²	0.675	0.914	0.876	0.975				

Results from all specifications for *internationalized internal armed conflict*. "ctfe": Estimation with importer-year and exporter-year fixed effects. "hdfe": Estimation with importer-year, exporter-year and country-pair fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01 indicate statistical significance at the 10, 5, and 1 percent level, respectively.

Table A.5: Results from all specifications for *non-state conflict*

dep variable:	ols ctfe		ols hdfe		ppml ctfe		ppml hdfe	
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
	In exports	In exports	In exports	In exports	exports	exports	exports	exports
i or j in conflict	-2.7892*** (0.165)	-0.0712* (0.038)	-11.2456*** (0.152)	0.0086 (0.012)				
i or j have neighbor in conflict	-0.2987*** (0.008)	0.0041 (0.007)	-9.3886*** (0.074)	-0.0000 (0.008)				
both in conflict	-5.6267*** (0.336)	-0.2183*** (0.084)	-15.0118*** (0.337)	0.0491 (0.045)				
In distance	-1.4464*** (0.007)	0.0360*** (0.012)	-0.3759** (0.152)	0.0034 (0.005)				
Preferential trade arrangement	0.3405*** (0.017)	0.0907*** (0.013)	-2.0573*** (0.396)	0.0317*** (0.009)				
Contiguity	0.3175*** (0.029)		-2.5299*** (0.495)					
Common official language	0.6060*** (0.015)		2.1474*** (0.195)					
Colonial link ever	1.1537*** (0.030)		-1.6651*** (0.364)					
Common colonizer post-1945	0.7919*** (0.019)		2.9023*** (0.291)					
Observations	399,784	397,185	400,584	400,584				
R ²	0.671	0.914	0.706	0.973				

Results from all specifications for *non-state conflict*. "ctfe": Estimation with importer-year and exporter-year fixed effects. "hdfe": Estimation with importer-year, exporter-year and country-pair fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01 indicate statistical significance at the 10, 5, and 1 percent level, respectively.

Table A.6: Results from all specifications for *one-sided violence*

dep variable:	ols ctfe		ols hdfe		ppml ctfe		ppml hdfe	
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)
	In exports	In exports	In exports	In exports	exports	exports	exports	exports
i or j in conflict	-3.3043*** (0.156)	-0.0014 (0.034)	-10.8925*** (0.108)	0.0500*** (0.010)				
i or j have neighbor in conflict	-0.2956*** (0.008)	0.0041 (0.007)	-9.3709*** (0.075)	0.0001 (0.008)				
both in conflict	-6.5661*** (0.316)	0.0273 (0.072)	-14.0048*** (0.275)	0.0282 (0.036)				
In distance	-1.4467*** (0.007)	0.0350*** (0.012)	-0.4311*** (0.152)	0.0049 (0.005)				
Preferential trade arrangement	0.3407*** (0.017)	0.0905*** (0.013)	-2.2148*** (0.415)	0.0372*** (0.009)				
Contiguity	0.3279*** (0.029)		-2.6122*** (0.463)					
Common official language	0.6089*** (0.015)		1.9449*** (0.196)					
Colonial link ever	1.1535*** (0.030)		-1.5047*** (0.368)					
Common colonizer post-1945	0.7834*** (0.019)		2.6475*** (0.281)					
Observations	399,784	397,185	400,584	400,584				
R ²	0.672	0.914	0.699	0.972				

Results from all specifications for *one-sided violence*. "ctfe": Estimation with importer-year and exporter-year fixed effects. "hdfe": Estimation with importer-year, exporter-year and country-pair fixed effects. Robust standard errors in parentheses. * p<0.1, ** p<0.05, *** p<0.01 indicate statistical significance at the 10, 5, and 1 percent level, respectively.

A.3 Countrylists

A.3.1 Countrylist of countries included in the analysis

Table A.7: Country list, (A-F)

Afghanistan	Central African Republic
Albania	Chad
Algeria	Chile
American Samoa	China
Andorra	Christmas Island
Angola	Cocos (Keeling) Islands
Anguila	Colombia
Antigua and Barbuda	Comoros
Argentina	Congo
Armenia	Congo, Dem. Rep.
Aruba	Cook Islands
Australia	Costa Rica
Austria	Cote d'Ivoire
Azerbaijan	Croatia
Bahamas, The	Cuba
Bahrain	Cyprus
Bangladesh	Czech Republic
Barbados	Czechoslovakia
Belarus	Denmark
Belgium	Djibouti
Belgium-Luxembourg	Dominica
Belize	Dominican Republic
Benin	East Timor
Bermuda	Ecuador
Bhutan	Egypt
Bolivia	El Salvador
Bosnia and Herzegovina	Equatorial Guinea
Botswana	Eritrea
Br. Antr. Terr	Estonia
Brazil	Ethiopia(excludes Eritrea)
British Indian Ocean Ter.	Ethiopia(includes Eritrea)
British Virgin Islands	Faeroe Islands
Brunei	Falkland Island
Bulgaria	Fiji
Burkina Faso	Finland
Burundi	Fr. So. Ant. Tr
Cambodia	France
Cameroon	Free Zones
Canada	French Guiana
Cape Verde	French Polynesia
Cayman Islands	

Table A.8: Country list, (G-Q)

Gabon	Macedonia (FYR)
Gambia, The	Madagascar
Georgia	Malawi
Germany	Malaysia
Ghana	Maldives
Gibraltar	Mali
Greece	Malta
Greenland	Marshall Islands
Grenada	Martinique
Guadeloupe	Mauritania
Guam	Mauritius
Guatemala	Mexico
Guinea	Micronesia, Fed. Sts.
Guinea-Bissau	Moldova
Guyana	Monaco
Haiti	Mongolia
Holy See	Montserrat
Honduras	Morocco
Hong Kong, China	Mozambique
Hungary	Myanmar
Iceland	Namibia
India	Nauru
Indonesia	Nepal
Iran	Netherlands
Iraq	Netherlands Antilles
Ireland	Neutral Zone
Israel	New Caledonia
Italy	New Zealand
Jamaica	Nicaragua
Japan	Niger
Jordan	Nigeria
Kazakhstan	Niue
Kenya	Norfolk Island
Kiribati	Northern Mariana Islands
Korea, Dem. Rep.	Norway
Korea, Rep.	Oman
Kuwait	Pakistan
Kyrgyz Republic	Palau
Lao PDR	Panama
Latvia	Papua New Guinea
Lebanon	Paraguay
Lesotho	Peru
Liberia	Philippines
Libya	Pitcairn
Lithuania	Poland
Luxembourg	Portugal
Macao	Qatar

Table A.9: Country list, (R-Z)

Reunion	Syrian Arab Republic
Romania	Tajikistan
Russian Federation	Tanzania
Rwanda	Thailand
Saint Helena	Togo
Saint Pierre and Miquelon	Tokelau
Samoa	Tonga
San Marino	Trinidad and Tobago
Sao Tome and Principe	Tunisia
Saudi Arabia	Turkey
Senegal	Turkmenistan
Seychelles	Turks and Caicos Isl.
Sierra Leone	Tuvalu
Singapore	Uganda
Slovak Republic	Ukraine
Slovenia	United Arab Emirates
Solomon Islands	United Kingdom
Somalia	United States
South Africa	Uruguay
South Sudan	Us Msc.Pac.I
Spain	Uzbekistan
Sri Lanka	Vanuatu
St. Kitts and Nevis	Venezuela
St. Lucia	Vietnam
St. Vincent and the Grenadines	Wallis and Futura Isl.
Sudan	Western Sahara
Suriname	Yemen
Swaziland	Yugoslavia
Sweden	Zambia
Switzerland	Zimbabwe

A.3.2 Country involvement per conflict type

Country	First year	Last Year	N	Location
Australia	2003	2003	166	
Cambodia	2011	2011	113	Yes
Cameroon	1996	1996	93	Yes
Djibouti	2008	2008	87	Yes
Ecuador	1995	1995	101	Yes
Eritrea	1998	2008	201	Yes
Ethiopia (excluding Eritrea)	1998	2000	417	Yes
India	1992	2003	1339	Yes
Iraq	2003	2003	77	Yes
Nigeria	1996	1996	105	Yes
Pakistan	1992	2003	1276	Yes
Peru	1995	1995	102	Yes
Thailand	2011	2011	136	Yes
United Kingdom	2003	2003	168	
United States	2003	2003	170	
Total	1992	2011	4551	80%

Table A.10: Countries which are involved in an *interstate armed conflict*. N indicates the total number of involvements (country-year). Location indicates whether the country was the location of the conflict. The percentage indicates the fraction of countries that were location of an *interstate armed conflict*.

Country	First year	Last year	N
Afghanistan	1992	2000	754
Algeria	1992	2011	1863
Angola	1992	2009	734
Azerbaijan	1993	1995	132
Bangladesh	2005	2006	293
Bosnia and Herzegovina	1993	1995	122
Burundi	1992	2008	926
Cambodia	1992	1998	430
Central African Republic	2002	2011	344
Chad	1992	2010	1057
China	2008	2008	162
Colombia	1992	2011	2658
Comoros	1997	1997	47
Congo	1993	1993	54
Cote d'Ivoire	2002	2011	473
Croatia	1995	1995	73
Djibouti	1992	1999	162
Egypt	1993	1998	676
Eritrea	1997	2003	133
Georgia	1992	2004	185
Guatemala	1992	1995	364
Guinea	2000	2001	203
Haiti	2004	2004	92
India	1992	2011	2967
Indonesia	1992	2005	1518
Iran	1992	2011	1900
Iraq	1992	1996	207
Israel	1992	2011	2561
Liberia	2000	2003	346
Libya	2011	2011	85
Macedonia (FYR)	2001	2001	76
Mali	1994	2009	413
Mauritania	2011	2011	104
Mexico	1994	1996	232
Moldova	1992	1992	30
Mozambique	1992	1992	60
Myanmar	1992	2011	1874
Nepal	1996	2006	1033
Niger	1992	2008	440
Nigeria	2004	2011	388

Table A.11: Countries which are involved in an *internal armed conflict*, (A-N). N indicates the total number of involvements (country-year).

Country	First year	Last year	N
Pakistan	1994	2011	1440
Papua New Guinea	1992	1996	254
Peru	1992	2010	1413
Philippines	1992	2011	2729
Russian Federation	1993	2011	2430
Rwanda	1992	2002	499
Senegal	1992	2011	857
Sierra Leone	2001	2001	92
Somalia	1992	2002	379
Sri Lanka	1992	2009	2168
Sudan	1992	2011	1931
Syrian Arab Republic	2011	2011	120
Tajikistan	1992	2011	389
Thailand	2003	2011	1437
Turkey	1992	2011	2868
Uganda	1992	2007	1304
United Kingdom	1998	1998	143
Uzbekistan	1999	2004	172
Venezuela	1992	1992	88
Yemen	1994	1994	56
Total	1992	2011	46940

Table A.12: Countries which are involved in an *internal armed conflict*, (P-Y). N indicates the total number of involvements (country-year).

Country	First year	Last year	N	Location
Afghanistan	2001	2011	1235	Yes
Albania	2004	2011	918	
Algeria	2004	2004	120	Yes
Angola	1997	2002	424	Yes
Armenia	1992	2011	620	
Australia	2001	2011	1765	
Austria	2006	2011	761	
Azerbaijan	1992	2011	850	Yes
Belgium	1999	2011	1416	
Bosnia and Herzegovina	1992	2011	871	Yes
Bulgaria	2004	2011	1177	
Canada	1999	2011	1918	
Central African	2001	2011	430	Yes
Chad	1997	2004	333	
Congo	1997	2002	344	Yes
Congo, Dem. Rep.	1996	2001	6	Yes
Croatia	1992	2011	969	Yes
Czech Republic	1999	2011	1304	
Denmark	1999	2011	1752	
Dominican Republic	2004	2004	119	
El Salvador	2004	2011	843	
Estonia	2004	2011	978	
Finland	2006	2011	912	
France	1999	2011	1942	
Georgia	2004	2011	983	Yes
Germany	1999	2011	1939	
Ghana	1999	1999	106	
Greece	1999	2011	1185	
Guinea	1992	1999	570	
Guinea-Bissau	1998	1999	72	Yes
Honduras	2004	2004	125	
Hungary	1999	2011	1031	
Iceland	1999	2011	965	
Iraq	2004	2011	694	Yes
Ireland	2006	2011	763	
Italy	1999	2011	1937	
Japan	2001	2002	337	
Jordan	2001	2011	799	
Kazakhstan	2004	2008	500	
Kenya	2011	2011	128	
Kuwait	2005	2005	124	
Kyrgyz Republic	2000	2000	69	
Latvia	2004	2011	971	
Libya	2001	2001	92	
Lithuania	2002	2011	1247	
Luxembourg	1999	2011	902	

Table A.13: Countries which are involved in an *internationalized internal armed conflict*, (A-L). N indicates the total number of involvements (country-year). Location indicates whether the country was the location of the conflict.

Country	First year	Last year	N	Location
Macedonia (FYR)	2004	2011	768	
Malaysia	2010	2011	287	
Mali	1999	2004	204	
Mauritania	2010	2010	112	Yes
Moldova	2004	2008	481	
Mongolia	2004	2011	618	
Namibia	2000	2002	303	
Netherlands	1999	2011	1928	
New Zealand	2002	2011	1244	
Nicaragua	2004	2004	105	
Niger	2004	2004	89	
Nigeria	1992	1999	779	
Norway	1999	2011	1706	
Pakistan	2002	2009	1279	
Philippines	2004	2004	160	
Poland	1999	2011	1826	
Portugal	1999	2011	1360	
Romania	2002	2011	1445	
Russian Federation	1993	2008	768	
Rwanda	1996	2011	555	Yes
Saudi Arabia	2004	2007	613	
Senegal	1998	1999	190	
Sierra Leone	1992	2000	579	Yes
Singapore	2009	2011	445	
Slovak Republic	2003	2011	1206	
Slovenia	2006	2011	823	
Somalia	2006	2011	456	Yes
South Africa	1998	1998	138	
Spain	1999	2011	1754	
Sudan	2003	2011	702	Yes
Sweden	2006	2011	937	
Switzerland	2006	2007	334	
Tajikistan	1993	1996	185	Yes
Tonga	2004	2011	183	
Turkey	1999	2011	1387	
Uganda	1997	2011	941	Yes
Ukraine	2004	2011	881	
United Arab Emirates	2009	2011	442	
United Kingdom	1999	2011	2104	
United States	1999	2011	1950	
Uzbekistan	1993	2000	171	Yes
Yemen	2009	2011	284	Yes
Yugoslavia	1999	1999	116	Yes
Zimbabwe	1998	2001	460	
Total	1992	2011	70844	24,4%

Table A.14: Countries which are involved in an *internationalized internal armed conflict*, (M-Z). N indicates the total number of involvements (country-year). Location indicates whether the country was the location of the conflict. The percentage indicates the fraction of countries that were location of an *internationalized internal armed conflict*.

Country	First year	Last year	N
Afghanistan	1992	2011	1052
Algeria	1995	1998	264
Bangladesh	1993	2001	372
Bolivia	2000	2000	94
Brazil	1994	2011	1483
Burundi	1997	2007	340
Cameroon	1992	1998	314
Canada	1995	1998	274
Central African Republic	2011	2011	81
Chad	1999	2007	292
China	2009	2009	158
Colombia	1993	2005	1350
Comoros	1998	1998	50
Cote d'Ivoire	1995	2011	815
Djibouti	1995	1995	45
Ecuador	2003	2003	135
Egypt	2011	2011	131
Georgia	1997	1998	150
Ghana	1992	2008	736
Guatemala	2005	2008	265
Guinea	2000	2011	200
Honduras	2010	2010	125
India	1992	2011	2163
Indonesia	1997	2001	610
Iraq	1992	2007	668
Israel	2006	2007	293
Jamaica	2001	2001	129
Kenya	1992	2011	2199
Kyrgyz Republic	2010	2010	87
Lebanon	1992	2008	845
Liberia	1992	1996	289
Madagascar	2002	2009	237
Mali	1994	1999	231
Mexico	1993	2011	1275
Myanmar	1995	2007	650
Nepal	2007	2007	118
Niger	1997	1997	64
Nigeria	1992	2011	2249
Pakistan	1992	2011	1454
Papua New Guinea	1999	2001	151
Philippines	1993	2011	670
Russian Federation	1994	1994	107

Table A.15: Countries which are involved in a *non-state conflict*, (A-R). N indicates the total number of involvements (country-year).

Country	First year	Last year	N
Senegal	2006	2006	125
Sierra Leone	1994	1995	116
Somalia	1992	2011	1217
South Africa	1992	1998	696
Sri Lanka	1994	2006	567
Sudan	1992	2011	2046
Syrian Arab Repu	2011	2011	120
Tajikistan	1992	1992	25
Tanzania	1997	1997	90
Thailand	1996	1996	134
Turkey	1997	1997	139
Uganda	1998	2009	1091
Yemen	2004	2010	204
Total	1992	2011	29785

Table A.16: Countries which are involved in a *non-state conflict*, (S-Y). N indicates the total number of involvements (country-year).

Country	First year	Last year	N
Afghanistan	1997	2011	1403
Algeria	1993	2009	1121
Angola	1993	2003	653
Azerbaijan	1992	1992	25
Bahrain	2011	2011	105
Bangladesh	1992	2004	838
Bosnia and Herzegovina	1992	1995	151
Brazil	1993	2005	269
Burundi	1994	2006	815
Cambodia	1992	1998	357
Cameroon	1994	1994	76
Central African Republic	2001	2011	609
Chad	1992	2007	748
China	2008	2008	162
Colombia	1993	2010	2284
Congo	1993	2002	398
Cote d'Ivoire	1993	2011	839
Croatia	1993	1995	127
Egypt	1995	2005	672
Georgia	1993	1995	95
Guatemala	1992	2011	480
Guinea	1996	2009	565
Guyana	2008	2008	99
Haiti	1993	2005	187
Honduras	2004	2004	125
India	1992	2011	2967
Indonesia	1992	2004	1481
Iran	2009	2009	145
Iraq	1992	2011	965
Israel	1994	2006	1068
Jordan	1992	2005	210
Kenya	2007	2011	561
Lebanon	1994	2006	343
Liberia	1992	2003	712
Libya	2011	2011	85
Madagascar	2009	2009	124
Mali	1992	2009	232
Mauritania	2009	2009	116
Mexico	1997	2011	414
Morocco	2003	2003	146
Mozambique	1992	1992	60
Myanmar	1992	2011	1691

Table A.17: Countries which are involved in *one-sided violence*, (A-M). N indicates the total number of involvements (country-year).

Country	First year	Last year	N
Namibia	2000	2002	207
Nepal	1996	2006	951
Niger	1995	1998	132
Nigeria	1994	2011	1475
Pakistan	1998	2011	1521
Papua New Guinea	1992	1996	113
Peru	1992	1993	173
Philippines	1995	2009	1030
Russian Federation	1995	2011	1453
Rwanda	1992	2009	433
Saudi Arabia	2003	2004	306
Senegal	1992	2002	501
Sierra Leone	1992	2002	683
Somalia	1992	2011	407
South Africa	1992	1994	299
Spain	2004	2004	166
Sri Lanka	1992	2009	1479
Sudan	1992	2011	2046
Syrian Arab Republic	2011	2011	120
Tajikistan	1992	1992	25
Tanzania	2001	2007	247
Thailand	1995	2011	1859
Togo	1993	2005	145
Turkey	1992	1999	713
Uganda	1995	2010	1538
United Kingdom	1993	2005	274
United States	2001	2001	170
Yemen	2011	2011	86
Zambia	1993	2000	148
Zimbabwe	2008	2008	122
Total	1992	2011	43345

Table A.18: Countries which are involved in *one-sided violence*, (N-Z). N indicates the total number of involvements (country-year).

		year
Pakistan	India	1992
Peru	Ecuador	1995
Nigeria	Cameroon	1996
Pakistan	India	1996
Pakistan	India	1997
India	Pakistan	1998
Pakistan	India	1999
India	Pakistan	2000
Pakistan	India	2001
India	Pakistan	2002
United Kingdom	Iraq	2003
United States	Iraq	2003
Australia	Iraq	2003
India	Pakistan	2003
Thailand	Cambodia	2011

Table A.19: Countries that are enemies in an *interstate armed conflict*, by year

		year
Croatia	Bosnia and Herzegovina	1993
Guinea	Nigeria	1997
Guinea	Sierra Leone	1997
Nigeria	Sierra Leone	1997
Rwanda	Angola	1998
Rwanda	Chad	1998
Guinea	Nigeria	1998
Guinea	Sierra Leone	1998
Nigeria	Sierra Leone	1998
Rwanda	Zimbabwe	1998
Uganda	Zimbabwe	1998
Rwanda	Zimbabwe	1999
Uganda	Zimbabwe	1999
Uganda	Namibia	2000
Uganda	Zimbabwe	2000
Australia	Afghanistan	2001
France	Afghanistan	2001
Canada	Afghanistan	2001
Italy	Afghanistan	2001
Netherlands	Afghanistan	2001
United Kingdom	Afghanistan	2001
Jordan	Afghanistan	2001
United States	Afghanistan	2001
Turkey	Afghanistan	2001
Russian Federation	Afghanistan	2001
Germany	Afghanistan	2001
Poland	Afghanistan	2001
Japan	Afghanistan	2001
Rwanda	Angola	2001
Rwanda	Namibia	2001
Rwanda	Zimbabwe	2001
Russian Federation	Georgia	2008

Table A.20: Countries that are enemies in an *internationalized internal armed conflict*, by year