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Cost of War: Economic Implications of Maritime and Territorial Disputes

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Abstract

Territorial and maritime disputes continue to figure prominently in international affairs. For instance, in the run up to the recent Hague ruling on the disputed territories in the West Philippine Sea/South China Sea, the potential risks of conflict appear to have increased. Should conflict break out, the implications will likely have widespread economic ramifications not just for the Asian region but also globally. Drawing on studies on the economics of conflict, this paper reviews the literature in this area and examines an array of economic costs associated with territorial and maritime disputes. These include adverse effects on certain economic and development outcomes arising from possible armed confrontation, with some of these possibly lingering in the aftermath of conflict. There are also costs associated with territorial disputes per se, emphasizing how these disputes also have implications on the livelihoods of resource users in the disputed areas. A clearer understanding of these economic links could help inform and motivate policymakers on mitigating the risks of conflict. By our estimates, a military conflict in the West Philippine Sea/South China Sea involving China, the Philippines and possibly other states with stakes in the region could result in economic damage, in terms of foregone average trade flows (expressed in 1985 US dollars), ranging from US$ 909.285 million to US$ 98.821 billion.

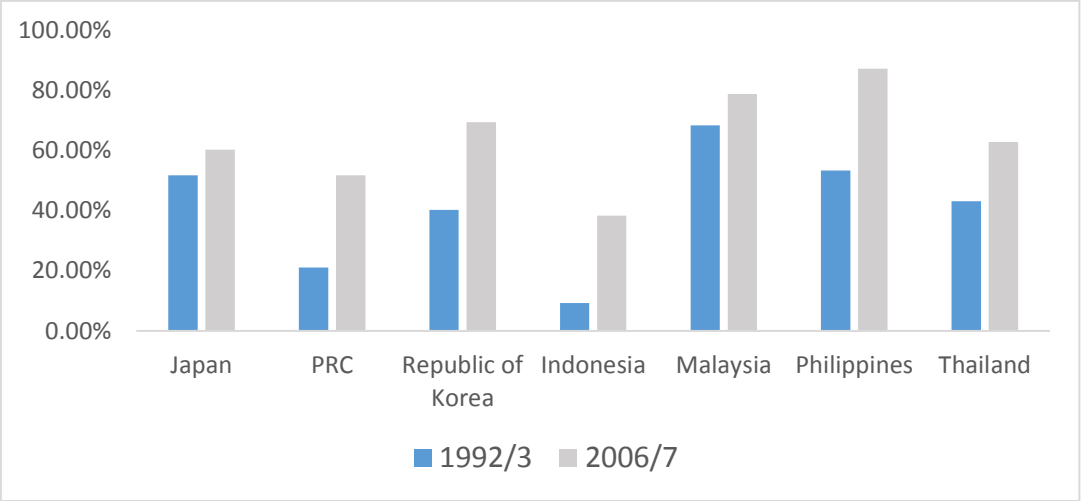
1. Introduction

There is an overall decline in the number of territorial disputes over the period 1948 to 2000. However, the decline plateaued in mid-1970s, as some territorial disputes lingered and new ones emerged (Schultz, 2015:126-127). Relatedly, Huth (1998:31) finds in his analysis of 129 territorial disputes from 1950 to 1990 that 46 percent of territorial disputes considered lasted for ten to thirty years while around 36 percent existed for more than thirty years.

Currently, some of the territorial and maritime disputes are located in vital areas for the international economic arena. For instance, in the Asia-Pacific region, a number of countries have overlapping claims in the West Philippine Sea/South China Sea and East China Sea. According to one unofficial estimate, the maritime economy in the West Philippine Sea/South China Sea—spanning petroleum, natural gas, fishing and other resources—could reach well over US$1 trillion (Mendoza, 2012). Furthermore, the stakes are high given the possible risks associated with such disputes on the international production networks and supply chains that are present in the said areas. Asian countries have seen an increased participation in such production chains in the recent years (see Figure 1.1), with some countries serving as production hubs of parts and components and others serving as assembly hubs of final products

(Cheewatrakoolpong, Sabhasri and Bunditwattanawong, 2013; APEC Policy Support Unit, 2013). The West Philippine Sea/South China Sea also serves as a vital passageway of commercial ships, with around US$ 5.3 trillion worth of trade passing through the said area every year (Glaser, 2012). If even a fraction of this is disrupted or destroyed, the economic implications of conflict could escalate and impose severe costs on global growth and national development prospects, even for those countries not directly involved but still affected.

Figure 1.1. Share of network products to total manufacturing export



Source: Adapted from Athukorala (2010:40).

Many territorial and maritime disputes continue to be a main source of tensions among the concerned countries, in some cases leading to military and other confrontations. By one estimate, around one-third of territorial disputes over the past two centuries have evolved into armed confrontations (Hensel, 1999 as cited in Wiegand, 2011:2). In some instances, such conflicts have lasted only for a couple of days while some, such as the Iran-Iraq war, have lasted for years.

Drawing on the results of various studies on the economics of conflict, the succeeding sections examine the potential economic costs associated with territorial and maritime disputes. Aside from the casualties and destruction of properties, interstate armed confrontations that may erupt as a result of such disputes have potential implications on the output and standard of living of the concerned countries, as well as on their trade and investment activities and development outcomes. It is also possible for such effects to linger beyond the war years. Results of some studies also suggest potential economic costs associated with the existence of territorial dispute per se. Such costs arise primarily from reduced economic activity due to uncertainties imposed by the dispute itself.

2. Economic implications of military conflicts among states

Various studies find evidence linking interstate military conflicts and territorial disputes. Results of the analysis conducted by Kocs (1995:170-172) using data on territorial disputes over the period 1945 to 1987 show greater frequency of war among countries with contested boundaries as opposed to those whose boundaries are clearly defined and legally valid. In addition, Hensel (1996:59) finds that militarized interstate disputes are almost thrice as likely to escalate into full-blown wars among country pairs with territorial dispute relative to those that are not involved in any dispute of similar type.

As noted by Hensel (2000:58-60), one explanation on the observed link between armed conflict and territorial dispute hinges on the array of values that a contested territory contains from the point of view of concerned countries. First among these are the tangible benefits, which include among others its resource and commerce-related endowments (for instance, if the territory has access to vital commercial routes). There also exist non-tangible benefits, such as its perceived historical connection to the claimant countries. The contested territory serves as a vital component of the claimant countries' identity and as such, territorial disputes evoke a sense of pride and nationalism among their citizens (Fearon, 1995:390 as cited in Hensel 2000:59; Luard, 1970:7 and Vasquez 1993 as cited in Hensel, 2000:60), making compromise agreement more difficult to achieve relative to the case where the dispute merely concerns resource-sharing issues (Fearon, 1995 as cited in Hensel, 2000:59). There are also reputation issues, in which case a claimant country would opt not to give up its claim due to fear of providing other countries greater leverage (Hensel, 2000:60).

Military conflicts are associated with significant costs on human life and on society. As posited by Stewart (1993, as cited in Harris, 1999:15-16), the economic costs of war can be classified as follows:

- *Human costs* which refer to the immediate costs borne by the society due to war. Included here are costs associated with reduced production of goods and services, reduced government expenditure on health and education due to diversion of fiscal resources for war time needs, and direct and indirect effects of war felt by households and individuals (such as casualties and injuries, foregone economic opportunities and foregone access to health and education services)

- *Development costs* which refer to costs associated with the depletion of an economy's capital stock and foregone investment due to war. Capital includes physical infrastructure as well as human and social capital. Examples of development costs include costs associated with the decrease in the proportion of educated workers in the labor force and the loss of trust and respect for law and private property due to war, among others.

The main channels through which these costs materialize are further elaborated below.

Casualties and immediate economic costs

One issue of interest concerns the valuation of economic costs associated with the loss of life during times of military conflict. While no metric can fully encapsulate the toll associated with the loss of life and injuries during war, such valuation can provide a benchmark estimate of the extent of human casualties caused by war. Glick and Taylor (2010:117-125) provide an estimate of the human costs associated with World Wars I and II. The corresponding prevailing average real wages during the war periods are used, along with certain assumptions on the share of labor force to total population and on the share of labor and human capital to total output, in providing a measure of human costs of the said wars among the belligerent countries.

As can be seen in Figures 2.1 and 2.2, there is a wide variation of estimated cost figures. In the case of World War I (in which some belligerent countries were engaged in territorial disputes and rivalries[1] beforehand), the losing parties (such as Germany and Austria-Hungary) have registered some of the highest cost-to-(pre-war) Gross Domestic Product (GDP) ratios, while the estimated total human costs of the said war are equivalent to around 3.4 percent of (pre-war) world GDP.

In contrast, estimated human costs associated with the Second World War amount to more than 6 percent of (pre-war) world GDP. For some countries, the estimated human costs of the Second World War amount to more than one-fifth of pre-war GDP, as in the case of USSR (whose cost-to-(pre-war) GDP ratio is 24.80%), Poland (whose cost-to-(pre-war) GDP ratio is 23.50%) and Yugoslavia (whose cost-to-(pre-war) GDP ratio is 22.60%).

In the aftermath of the Second World War, some territorial disputes have evolved into running skirmishes and military disputes (see Table 2.1). While other factors have also contributed to the decision of concerned countries to resort to military conflict, analysts have

[1] These include among others territorial disputes between France and Germany, and between Austria-Hungary and Serbia, some of which have lingered for centuries (Cashman and Robinson, 2007; Hensel, 1996)

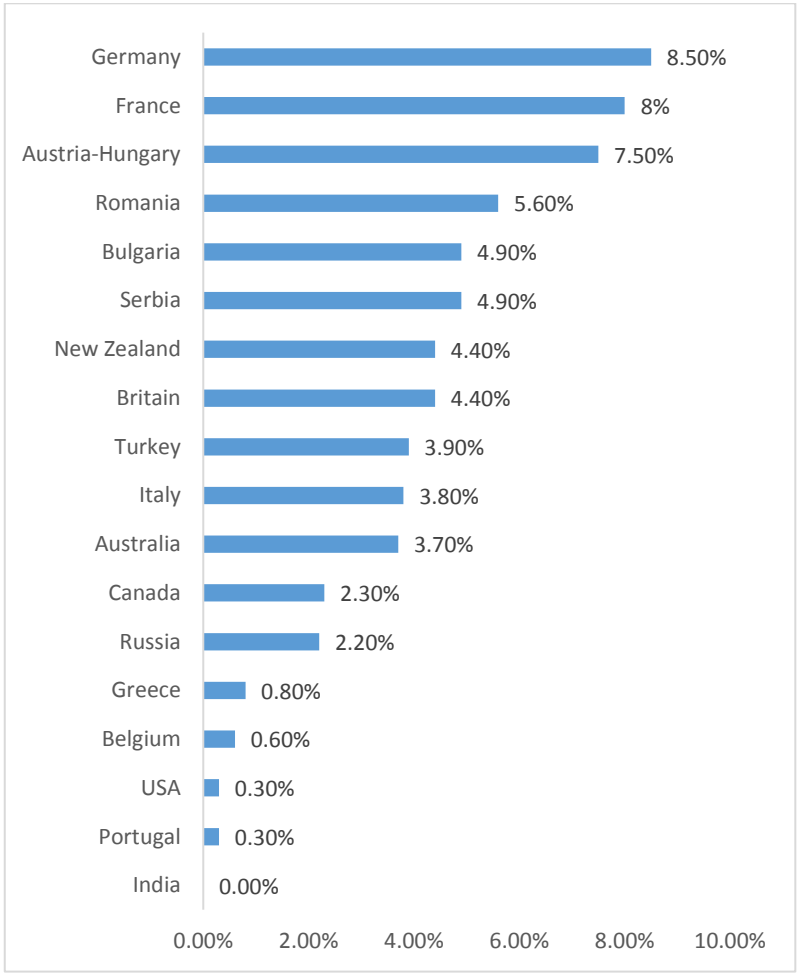
considered territorial dispute to be an influential factor. For instance, as posited by West (2006:77), the Vietnamese government's claim of historical rights over Spratly islands in the aftermath of the Vietnamese war, along with geopolitical considerations, has contributed in part to the emergence of the Sino-Vietnamese war.

Some territorial disputes are characterized by recurring skirmishes among claimant countries in the past. Such was the case of the dispute between Peru and Ecuador with regards to the demarcation of their 883-mile long border. The territorial dispute commenced shortly after Ecuador declared independence from Great Colombia in 1830 and persisted for years until an agreement was signed in 1998 by the Presidents of both countries. Before 1998 however, there were at least 34 instances of military conflict arising from the said dispute, including a military confrontation in 1995 (Simmons, 1999:10-19).

While there are differences with regards to the duration of military conflicts, all of them are associated with significant casualties and costs. By one estimate, the Iran-Iraq war cost Iran around US$ 644 billion, with war damage and lost potential production (excluding oil) comprising a large part (at around US$ 450 billion) of the estimated cost. Iraq, on the other hand, is estimated to have incurred economic cost amounting to US$ 453 billion which includes oil revenue losses amounting to US$ 198 billion. Such estimated losses amount to around 60 percent of Iran's Gross National Product (GNP) and 112 percent of Iraq's GNP over 8 years of war (Mofid 1990 as cited in Harris 1999:18-19).

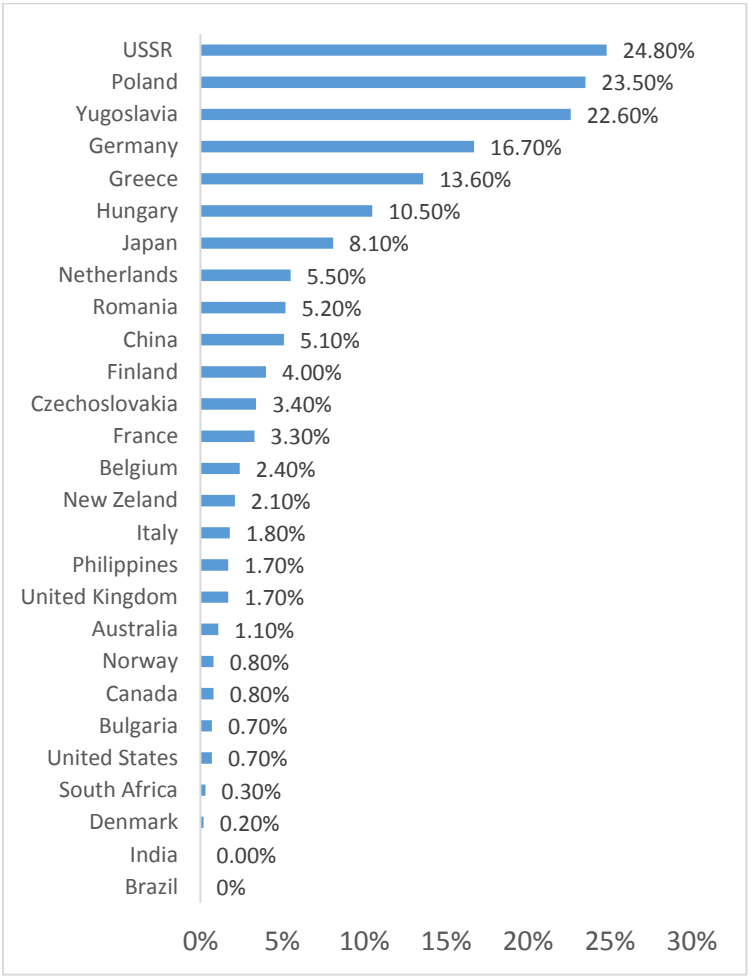
Casualties due to military conflicts may also continue to pile up even after the war, as in the case of the First Gulf War. These include the post-conflict death of many Iraqi civilians due to lack of purified water systems, lack of well-functioning health care delivery systems and destruction of vital infrastructures (such as power generating plants), among others (Alnasrawi, 1992:345-346).

Figure 2.1 Estimated Human Costs- to-(1913) GDP ratio among World War I belligerent countries



Source: Adapted from Glick and Taylor (2010:117).

Figure 2.2 Estimated Human Costs-to- (1938) GDP ratio among World War II belligerent countries



Source: Adapted from Glick and Taylor (2010:122).

Table 2.1 Selected post-World War II Skirmishes Associated with Territorial Disputes

Date of encounter	Countries included	Disputed territory	Casualties and associated costs
April 2 to June 14, 1982	United Kingdom and Argentina	Falkland Islands	• Military casualties: death of around 800 to 1,000 Argentine soldiers and 250 British soldiers • Estimated cost to the British government of around US$ 1.19 billion • Estimated cost of around US$ 5 billion to the Argentine government
February 16 to March 17, 1979	People's Republic of China and Vietnam	Overlapping claims over certain islands in the Spratlys area	• Death of around 25,000 to 28,000 Chinese soldiers and injury of around 37,000 soldiers • Death of around 20,000 Vietnamese soldiers and injury of around 35,000 to 45,000 soldiers
1980 to 1988	Iran and Iraq	Shatt Al Arab waterway	• Estimated death toll of around 1,000,000 in Iran and 250,000 to 500,000 in Iraq • Estimated economic cost amounting to US$ 644 billion in Iran and US$ 453 billion in Iraq
August 2, 1990 to February 28, 1991	Iraq and Kuwait	Kuwait	• Death of around 50,000 to 120,000 Iraqi soldiers • Death of around 5,000 to 15,000 Iraqi civilians during the war • Death of around 20,000 to 100,000 Iraqi civilians during the uprisings conducted in the aftermath of the war • Death of around 15,000 to 30,000 displaced Iraqi civilians • Death of around 4,000 to 16,000 Iraqi civilians due to starvation and disease • Estimated replacement cost of destroyed Iraqi assets: US$ 200 billion • Estimated cost of war in Kuwait: US$ 65 billion • Reduction in Kuwait's GDP and increase in government debt

January 26, 1995 to February 28, 1995	Ecuador and Peru	Dispute over 883-mile long border (which includes Condor Mountain range)	• Around 200 to 1,500 casualties • Estimated total cost of up to US$ 1 billion
May 1998 to June 2000	Ethiopia and Eritrea	Border areas (Badme, Tsorona-Zalambessa and Bure regions in Ethiopia)	• Estimated total military fatalities of around 70,000 to 100,000 • Internal displacement of around 360,000 people in Ethiopia as of May 2000 • Internal displacement of around 1.1 million people in Eritrea during the war

Source: Compiled by the authors from various sources.

Impact on economic growth and standard of living

Armed interstate conflict can also affect economic growth and the standard of living in different ways. War is associated with casualties and destruction of properties and productive capacities of a country, in turn adversely affecting its economy in the short run (see for instance Yamarik, Johnson and Compton, 2010). Military conflicts are also associated with build-up of military capabilities, which affects the economy through various channels. First among these are the demand effects which include multiplier effects associated with increased military spending and crowding out of other expenditures. The crowding out effect would depend on how the additional military spending is financed. If for instance, the increase in spending is financed through additional government borrowing, this may lead to increase in real interest rates which can then crowd out private investment. On the other hand, additional military spending can result in changes in output of other industrial sectors as some resources are reallocated toward the defense industry (Dunne, Smith and Willenbockel, 2005:450-451).

To the extent that increased security leads to increased economic activity, and increased military spending leads to increased security, greater military spending can, in some cases, produce positive consequences for a country's economy. However, greater military spending in one country can possibly lead to an arms race with other countries, which can then adversely affect the security situation of those countries (Dunne, Smith and Willenbockel, 2005:451).

Table 2.2 contains information on selected studies on the relationship between interstate military conflict and output variables. Some studies find evidence showing that an interstate military conflict has negative effect on output growth and standard of living. Yamarik, Johnson

Table 2.2 Selected studies on the impact of military conflict on GDP growth and GDP per capita

Authors	Observations	Empirical method	Results
Yamarik, Johnson and Compton (2010)	158 countries over the period 1960 to 2000	Deep determinants regression approach	• A standard deviation increase in fatality-weighted conflict indicator results to a decrease in 2000 real GDP per capita by around 14% of a standard deviation.
Polachek and Sebastianova (2009)	81 countries over the period 1970 to 2000	Fixed effects regression	• High-intensity interstate military conflict reduces annual growth by 0.18 to 2.77 percentage points. • High-intensity interstate military conflict results to lower annual economic growth across all countries using observations with one-year and two-year time intervals • High-intensity interstate military conflict results to lower annual economic growth using observations from low-income and African countries
Koubi (2005)	114 countries over the periods 1960 to 1974 (for war/conflict observations) and 1975 to 1989 (for observations on economic growth)	OLS regression (with conflict indicator that is not contemporaneous with economic growth)	• Doubling the duration of war from its mean value increases per annum economic growth by 22%
Miguel and Roland (2011)	Vietnamese provinces; 1992/ 1993 and 2002 observations on outcome indicators	Instrumental Variable- Two Stage Least squares (IV-2SLS) method	• No robust adverse effects of US bombing on poverty rates, consumption levels, electricity infrastructure, literacy or population density through 2002

Source: Synthesis of studies compiled by the authors.

and Compton (2010:16) find that a one standard deviation increase in the value of a country's conflict indicator[2] results in a reduction of about 14 percent of standard deviation of its 2000 real GDP per capita.

Polachek and Sebastianova (2010:16-24), on the other hand, find evidence indicating the presence of short run effects associated with interstate military conflict. Results show that a one unit increase in the number of war dead per thousand population leads to 2.20 percent and 2.25 percent lower average economic growth rate using observations that utilize two-year and one-year time intervals[3], respectively. Similar results are also observed for regression runs using observations from low-income countries as well as African countries, suggesting a significant toll on developing countries associated with such conflicts.

However, other studies yield results showing an insignificant or even positive relationship between interstate war and output variables. For instance, results of the analysis by Koubi (2005:78) show that greater war duration from 1960 to 1974 is associated with higher average annual economic growth over the period 1975 to 1989 using a sample of 114 countries. As such, this potentially suggests the presence of a "phoenix factor" in certain cases, a term coined by Organski and Kugler (1977) upon observing that countries on the losing side have recovered rapidly within 15 to 20 years after the two world wars.

Various explanations have been put forward to explain the said observation. Consistent with the predictions of the neoclassical growth theory, it is possible for countries to experience convergence in the long run (Koubi 2005:79). Also, it is possible that interstate military conflict has undermined if not eliminated the vested interests opposed to economic reforms in belligerent countries (Olson, 1982). Aside from possible multiplier effects, increased military activity can potentially induce an increase in research and innovation activities, in turn affecting an economy's long-run trajectory (Ruttan, 2006).

Relatedly, Miguel and Roland (2011) make use of variations across provinces in bombing intensity and distance from the demarcated boundary of North and South Vietnam to determine the long run impact of US bombing activities during the Vietnam War. Results show that the bombing activities do not have a negative effect on poverty incidence, consumption level and population density years after the war (Miguel and Roland, 2011:8-12). As posited

[2] The conflict indicator is formulated by first computing the weighted sum of all bilateral conflicts in which a particular country is involved during a particular year, with the average daily fatality figure of each conflict serving as its weight. The yearly indicators from 1960 to 2000 are then summed up to generate the conflict indicator used in their study.

[3] For two-year time intervals, one observation corresponds to 1971 to 1972, 1973 to 1974, and so forth. The average value of most indicators for years included in a unit of observation serves as the value of such indicators for that unit of observation.

by the authors, it is possible that the heavily-bombed areas received a significant amount of resources for reconstruction. Additional analysis[4] conducted by the authors provide evidence that cohere with such conjecture, suggesting the importance of having strong institutions in the aftermath of the military conflict.

Impact on trade and investment

Military conflict can also affect trade through different channels. On the one hand, military encounters can disrupt commerce, thereby reducing the volume of trade among the concerned countries. Alternatively, there are also security externalities associated with trade not usually factored in by firms involved in exporting and importing business. These include export of strategic goods which can strengthen the military capabilities of an adversary country as well as income gains that can be attained by an adversary country as a result of trade. To the extent that governments are aware of the presence of such externalities, policies can be initiated to push firms to internalize them, thereby reducing trade among warring countries (Kastner, 2007:667-668).

As show in Table 2.3, there are studies which find that a military conflict has negative impact on bilateral trade (Pollins 1989; Anderton and Carter, 2001; Glick and Taylor, 2010), while other studies find limited or insignificant impact (Morrow, Siverson and Tabares, 1998; Barbieri and Levy, 1999).

Some authors attempt to explain the mixed results observed in the literature. For instance, Li and Sacko (2002:13-19) posit that the impact of military conflict on trade depends on the predictability of the conflict on the part of the firms. War can be considered as a product of a stochastic process, in which case the governments do not have full expectation *ex ante* that a military conflict will occur. Traders do not have more complete information than their respective governments, and as such do not also fully expect the occurrence of such armed confrontation. The negative impact of a military conflict on bilateral trade will be greater: (a) if it is less expected that the conflict will exist, (b) if all parties do not expect beforehand that it will be severe, and (c) if the conflict endures longer than expected. Empirical analysis conducted by the authors yield results that cohere with their conjectures, with the unexpectedness of the onset of a military conflict between states and of its severity and duration all having negative impact on bilateral trade (Li and Sacko, 2002: 27-33)[5].

[4] See Miguel and Roland (2011:12-14)

[5] In this case, the authors simulate the firms' calculation of the possibility of a military conflict by modelling the onset of a conflict as a function of various variables which include bilateral trade flows and trade interdependence,

Furthermore, as noted by Glick and Taylor (2010:103), some of the empirical studies use samples that include relatively short time series and limited set of countries (such as only the contiguous or politically relevant ones), which suggest a higher likelihood of presence of selection bias. In this case, Glick and Taylor (2010) make use of a large dataset of bilateral trade covering 172 countries over the period 1870 to 1997 and extend the analysis on two fronts: (i) inclusion of lagged terms to determine if a military conflict[6] has effects on trade beyond its contemporaneous impact, and (ii) examination of the possible presence of spill-over effects associated with a military conflict. Their results show that war has a significant negative impact on trade between belligerent countries, with the said effect lingering for a couple of years. War also has an adverse effect on trade between belligerent and neutral countries, with more remarkable figures observed when the analysis is limited to the major wars (see Table 2.3) (Glick and Taylor, 2010:109).

Other studies examine the impact of a military dispute on inflow of foreign direct investments. The emergence of such type of conflict can increase the risk associated with operating on countries that are party to the dispute, in turn increasing the uncertainty on the returns that firms can earn from their investments (Jensen, 2006; Jensen and Young 2008; Bussman, 2010). The presence of risk may induce multinational firms to resort to measures that aim to ensure that their operations will remain smooth (such as increasing the security of their affiliate offices), which will then increase the cost associated with operating in those countries (Spich and Grosse, 2005).

It is also possible that host country governments modify their regulatory policies toward foreign investments as a result of a military conflict. Governments can utilize an array of tools which include imposition of capital controls to discourage their multinational enterprises to invest on their adversaries. Also, such governments can induce affiliates of multinational firms from hostile countries to repatriate less amount of profit to their respective countries of origin and even expropriate the firms' assets as a result of the military conflict (Li and Vaschilko, 2010:767-768). Both of these are expected to reduce the amount of bilateral investments among countries that are party to a military dispute.

historical commonality, distance, presence of alliance and the presence of a major world power in a country pair or dyad, among others.

[6] This includes declarations of war and conflicts associated with more than 1,000 battle deaths.

Table 2.3 Selected Studies on the Impact of Military Conflict on International Trade

Authors	Observations	Empirical method	Results
Pollins (1989)	25 countries over the period 1960 to 1975	OLS regression applied to cross section of countries for each year	• Lagged conflict indicator is (statistically) significantly related to trade variable on all regression runs
Morrow, Siverson and Taberes (1998)	7 countries (considered major powers) over the period 1907 to 1913, 1920 to 1938, 1948 to 1990)	OLS regression (but use of panel corrected standard errors in place of usual standard errors)	• Militarized interstate dispute does not have a statistically significant effect on trade
Barbieri and Levy (1999)	7 dyads (Argentina-UK, UK-China, UK-Egypt, Cyprus-Turkey, Greece-Turkey, Uganda-Tanzania, USA-China) over the period 1870 to 1992	Interrupted time series analysis	• Statistically significant and negative effect of war on trade on only one dyad (Argentina-UK) • No adverse permanent effect associated with war on trade for all dyads included
Anderton and Carter (2001)	14 major power dyads and 13 non-major power dyads	Interrupted time series analysis	• Greater number of dyads for which war has a negative and significant effect on trade
Li and Sacko (2002)	One dataset consisting of 56 countries from 1870 to 1992 Post-war dataset consisting of 120 countries from 1950 to 1992	Fixed effects regression	• Onset of an unexpected militarized interstate dispute and the degree of unpredictability of such dispute reduce bilateral trade *ex post*
Glick and Taylor (2010)	50 countries over the period 1870 to 1938 and 171 countries over the period 1938 to 1997	Country-pair fixed effects regression	• 85 percent decline in average trade flow between belligerent countries at the onset of a military conflict • Decline in annual average trade flow between belligerent countries of about 3 to 73 percent in the decade after the onset of a conflict (with larger decline observed in the

			years immediately preceding the onset of a military conflict) • Decline in annual average trade flow between belligerent and neutral country of about 5 to 12 percent as a result of a military conflict and about 42 to 65 percent as a result of major wars

Source: Synthesis of various studies compiled by the authors.

Li (2006:245-251) finds that the emergence of an unanticipated military dispute among states is associated with a lower probability that a country will be chosen as location for potential investment. Relatedly, using data on 1,117 dyads or country pairs from 1980 to 2000, Li and Vaschilko (2010:773-776) find that military conflict affects bilateral foreign direct investments only for dyads in which one country is a high income country and the other a low income country. On the other hand, military conflicts are found to have insignificant effect on bilateral investments between high income countries.

The authors posit that a possible explanation behind the observed result concerns the existence of relatively few military disputes among high income country pairs in the sample. Many high income countries have democratic governments and disputes are usually settled through mediation. Another possible explanation put forward by the authors concerns the difference with regards to the dominant type of bilateral investments for the two types of country pairs in the sample. In particular, bilateral investments for high income-low income country pairs tend to be more vertical, in which case, the investment made is a vital component of a production chain that serves a large market while bilateral investments for high income countries tend to be more horizontal. It is possible for a military dispute to have more significant impact on vertical-type investments given that various countries (in particular, all countries that are part of the production chain) are affected in this case as opposed to horizontal-type investments in which the disruption is limited only to countries that are part of the dispute (Li and Vaschilko, 2010:775).

Other effects of interstate military conflict

Some studies show that it is possible for the effects of interstate conflicts to linger in the post-war years. For instance, Che, Du, Lu and Tao (2015) analyse the long-run impact of Japanese

occupation of China in the years preceding the Second World War by using trade and investment data at the provincial-level. Results show that a one percentage point decrease in the ratio of civilian casualties to pre-war population is associated with a 7.9 percent increase in the amount of direct investment projects from Japan, a 23.3 percent increase in investment from Japan in 2001 and a 16.3 percent increase in accumulated investment (until 2001) from Japan. A possible explanation cited by the authors hinges on the war memories that may have been passed on to succeeding generations and related psychological conditions which include lack of mutual trust on the part of some of their citizens (Che, Du, Lu and Tao, 2015:186-195).

Some studies have also shown that military conflict can adversely affect development outcomes. For instance, Akresh, Lucchetti and Thirumurthy (2012:335-337) find that Eritrean children who were born during the Ethiopian-Eritrean conflict from 1998 to 2000 (see Table 2.1) and were living in a conflict region have 0.42 standard deviation lower height-for-age Z scores. This in turn makes their average height-for-age Z score 22 percent lower than that of children who were born in a non-conflict region during the war. This has implications on the future health, education and labor market outcomes of the affected children, with the affected children estimated to have 4.3 percent less wage in their adulthood [7].

Moreover, Ichino and Winter-Ebmer (2004:59-68) find that individuals from Austria and Germany (countries whose civilian population were significantly affected in the Second World War) who were born in the 1930s have lower educational attainment than their counterparts in Switzerland and Sweden. Among the possible reasons cited by the authors include reduction in financial means and disruptions in schooling caused by intermittent bombings during the war. Furthermore, it is possible that many of those individuals had fathers who were actively serving in the military during the war, which then could have disruptive consequences on their education outcomes. The authors also find that the similar cohort of individuals in Austria and Germany have, on average, lower wages, 40 years after the war, as compared to the similar cohort in Switzerland and Sweden (Ichino and Winter-Ebmer, 2004:78-81).

3. Economic implications of border disputes

Territorial disputes are often associated with two types of uncertainty which can affect economic activities. On the one hand, jurisdictional uncertainty exists in which case there is

[7] The estimate is based on the following figures: Alderman, Hoddinott and Kinsey (2006) find that a one standard deviation decrease in height is associated with 0.678 fewer grades completed in Zimbabwe while Krishnan, Selassie and Dercon (1998) estimate the returns to education in Ethiopia to be around 15 percent.

ambiguity on whose rules and legal protections will apply on a certain jurisdiction. This in turn induces higher risk on the part of firms when conducting cross-border transactions. Such was the case in the Persian Gulf area in which shipping and fishing are occasionally disrupted due to the existence of dispute between Iran and United Arab Emirates over Abu Musa Islands (see Box 3.1 for further details). On the other hand, territorial disputes are also associated with policy uncertainty to the extent that countries that are parties to territorial disputes tweak their policies in response to the dispute. Such was the case of Nicaragua, which imposed a 35 percent tariff on all goods from Honduras and Colombia in response to their maritime delimitation agreement, which Nicaragua criticized as including an area it considers as part of its territory (Simmons, 2005:828-829).

Using data from 1950 to 1995 for 557 contiguous country pairs, Simmons (2005:835) finds that the presence of a territorial dispute between country pairs is associated with a 28 percent decline in the value of their bilateral trade in the short run. Furthermore, Simmons (2005:835) finds that a territorial dispute has a long-run effect on bilateral trade of contiguous countries. In particular, territorial dispute is associated with a reduction in the average value of annual bilateral trade, from the sample mean of US$ 3.17 million to around US$ 2.3 million in the short run, and to around US$ 1.17 million in the long run.

These suggest a significant amount of foregone trade when applied to some cases of countries with territorial disputes. For instance, Simmons estimates that the previous territorial dispute between Argentina and Chile (which lasted from 1950 to 1995) is associated with cumulative foregone trade amounting to almost US$ 33 billion over the same period. The said figure is close to the estimated total military spending by Argentina over the period 1962 to 1994 (at US$ 37 billion) and is higher than the counterpart figure for Chile (at US$ 22 billion). While the estimated cumulative losses in bilateral trade are smaller for other countries, the estimated amounts can still be considered as significant. In the case of Ethiopia and Kenya, it is estimated that the territorial dispute (which lasted from 1963 to 1970) is associated with foregone bilateral trade amounting to US$ 44 million. This is equivalent to more than one-tenth and about 23 percent of total overseas development assistance received by Kenya and Ethiopia, respectively, over the same period (Simmons, 2005:836-838).

Similarly, results of the analysis by Brutger and Wright (2014) applied over a sample of 490 pairs of countries[8] from 1950 to 1990 show that the marginal effect of the presence of a

[8] The study included only country pairs that are adjacent to each other or separated by no more than 400 miles of water.

bilateral dispute amounts to a loss of more than half (around 55 percent) of value of annual trade between countries in a dyad. Interestingly, the same study finds that for a given country pair, the presence of both territorial and militarized disputes is associated with a 2.5 percent increase in the annual value of third-party trade. The authors posit that the said result suggests a possible trade diversion toward third-party countries, but only when there is a sufficiently high level of dispute escalation[9].

Many areas that are subject to territorial dispute contain various resource endowments (such as diverse fisheries and other marine resources) and as such, the uncertainties associated with a territorial dispute also affect those who depend primarily on the said endowments for their livelihood. Box 3.1 contains cases of territorial disputes and how these affect those who traditionally fish in the disputed areas. In most cases, fishermen tend to be caught in between countries that are party to the dispute. There are reports of harassment experienced by such fishermen, ranging from confiscation of some of their tools to use of force (such as ships and air forces) to drive them away from the disputed area.

[9] The authors do not find a strongly significant effect of presence of territorial dispute on trade with other parties.

Box 3.1. How fishermen in disputed areas are affected by territorial disputes: Selected cases

- India and Sri Lanka

  Given the unclear demarcation of maritime boundary in the Palk Strait, a series of arrests of fishermen from one country have been made by another on charges of illegal poaching. About 626 Indian fishermen were arrested by Sri Lankan authorities in 2013, while around 200 Sri Lankan fishermen were arrested by Indian authorities over the same period (Colombage, 2014).

  Anecdotal evidence suggests that some fishermen from both countries experienced harassment from the Navy and fishermen of the other country. Sri Lankan authorities were reported to have confiscated equipments, cellphones and fish containers of some Indian fishermen. One report also notes that as of 2012, at least 100 Indian fishermen have been killed and 350 have been injured as a result of the dispute. Sri Lankan fishermen, on the other hand, have complained that Indian fishing fleets have committed overfishing activities in their waters and have utilized fishing tools (such as bottom trawlers and monofilament nylon nets) that are banned in Sri Lanka (Yardley, 2012).

- Colombia and Nicaragua

  After a case was brought to the International Court of Justice (ICJ) by Nicaragua in 2011, the court's decision in 2012 has paved the way for the transfer of a sea area of about 30,000 square miles from Colombia to Nicaragua. The said area has been considered as a rich fishing ground and potentially has significant amount of oil. Reports indicate the presence of Colombian Navy warships in the area in the aftermath of the Court's decision, and that warships, as well as helicopters and planes, were reportedly used to harass Nicaraguan fishermen. This in turn induced the Nicaraguan government to send coast guard ships in the area (The Economist, 2012).

  The Colombian government announced that it would continue its navy and aerial patrols in the area, with a navy commander reportedly given instruction to "maintain the sovereignty of Colombia's maritime jurisdiction as it has been historically known" (Castro 2012). Results of a survey conducted in Colombia the aftermath of the ICJ decision show that around 85 percent of respondents believe that their government should not accept the ruling despite the possible implications of such move with regards to its relations with Nicaragua (The Economist, 2012; Paterson and Flyn, 2013:6).

- United Arab Emirates and Iran

  Territorial disputes between the United Arab Emirates and Iran concern Abu Musa, and Greater and Lesser Tunbs Islands. Abu Musa is approximately thirty-four miles away from UAE and forty-three miles away from Iran. A previous agreement stipulated co-management by Iran and UAE of Abu Musa islands. However, Iran has taken steps to have a monopoly of control over the said island, constructing an airstrip and increasing its military presence in the said island (Seddiq, 2001).

  The Greater and Lesser Tunbs islands, on the other hand, are located in an area that is considered as passageway for international ships. The dispute between the two countries has caused intermittent disruption of shipping and fishing activities in the disputed area. In 2013, for instance, the Iranian authorities arrested 12 UAE and 1 Indian fishermen for alleged trespassing. The fishermen were freed days later, after reportedly signing a document stating that they will never trespass the territorial waters of Abu Musa Island (Shaaban, 2013).

- Vietnam, Philippines and China

  Vietnam, Philippines and China are among the countries with overlapping claims in the West Philippine Sea/ South China Sea area. In the recent years, reports surface of Chinese fishing vessels expanding their operations into areas that serve as traditional fishing grounds for Vietnamese fishermen. Reports indicate various instances during which Chinese vessels would arrive as a group (sometimes accompanied by Chinese authorities), making it difficult for Vietnamese authorities to disperse such ships from traditional Vietnamese fishing grounds (see for instance Huy, 2011 as cited in Tuan, 2012-13:100).

  Some reports also suggest harassment among Vietnamese fishermen by Chinese soldiers, with one report suggesting that some Vietnamese fishermen were denied entry in Paracel islands during a period of severe weather in late 2007. The Chinese soldiers eventually allowed such fishermen to enter the islands. However, the fishermen were reportedly detained and were asked to sign a document certifying that they have entered Chinese waters in the aftermath of the storm. Properties of some Vietnamese fishermen were also reportedly confiscated by Chinese authorities, such as fuel supplies owned by Vietnamese fishermen, leaving only sufficient amount of fuel for the fishermen to be able to return to Vietnam (Tuan, 2012-13:101-102).

  Similarly, the standoff between the Philippines and China in Scarborough shoal (which was a traditional fishing ground of fishermen in nearby Zambales province) in 2012 has narrowed the areas where people can safely conduct their fishing activities. Reports of harassment surfaced, with some Filipino fishermen reportedly driven out of the periphery of the shoal by Chinese authorities through water cannon. Reports also suggest that Filipino fishermen are denied entry to Scarborough shoal even in the presence of typhoon or any severe weather. As a result of the dispute, some fishermen were reported to have shifted to other livelihood activities (such as hog raising) (Associated Press, 2013; Cupin, 2015).

Source: Compiled from various sources.

Such moves, as well as the reluctance of one party to accept entry of fishermen from other claimant countries in its occupied portion of the disputed areas, narrow the area where fishermen can pursue their fishing activities with minimal uncertainty, in turn affecting their earnings and livelihood. In many developing countries, a significant number of fishermen belong to low-income households[10] and that fishing activities serve as one of the main sources of their earnings. While it is possible for such fishermen to shift to other occupation in the long run, the dependence of many of them to fisheries suggests their vulnerability to the short run disruptive effects of a territorial dispute.

Furthermore, the fishing industry supports a range of other industries, including fish processing, production of tin cans and shipbuilding, among others. The contribution of such broader economic activities can be considered as significant, with one estimate showing that the value of output supported by such industries amount to around US$ 240 billion per year, three times larger than the estimated landing value of marine fisheries (Dyck and Sumaila, 2010:235). A territorial dispute can affect not only the direct fisheries output of a country that is party to the dispute but also the output of other sectors supported by the fishing industry. Also, some disputed areas serve not only as traditional fishing grounds but are intertwined as well with other fishing grounds in the area. The South China Sea/West Philippine Sea, for instance, is estimated to house 100,000 square kilometres of coral reefs, or around 34 percent of the world total (Burke et al 2002:8). As such, territorial disputes have implications not only on the management of the resources in the disputed areas but also of resources on other fishing grounds that are biologically related to them.

4. The Economic Cost of War: The Case of West Philippine Sea /South China Sea

Existing empirical research on the economic costs of conflict can be used as a basis to assess the cost of a military conflict that can potentially arise from a territorial/ maritime dispute. In particular, the results of some studies are used to estimate the cost of a potential armed conflict in the West Philippine Sea /South China Sea, where various countries have overlapping and competing territorial and jurisdictional claims. The fundamental basis for this estimate is that conflict will disrupt economic activity and cause a severe contraction in international trade. In order to illustrate, this section examines the potential economic implications of an armed

[10] One estimate shows that around 20 percent of fishermen are small-scale fishermen who earn less than US$ 1 a day, and that many of them can be found in Asia (FAO, 2002).In the case of the Philippines, poverty incidence among fishermen is estimated to be around 39.2 percent in 2012 (PSA-NSCB. 2012).

conflict, in particular among the following country pairs: (a) Indonesia and China, (b) China and the Philippines, and (c) China and Vietnam.

As a first step, we build on work by Glick and Taylor (2010) who undertake one of the most comprehensive empirical analyses of conflict. The results of their analysis show that a military conflict between two countries is typically associated with a significant reduction in bilateral trade, estimated to be 85% of their average trade flow in 1985 US dollars, during the onset of the conflict. Furthermore, conflict has lingering effect on bilateral trade between two belligerents, with the adverse effect on trade very slowly tapering off only after a decade (see Table 4.1). As can also be seen in Table 4.1, the same study finds that a military conflict has an adverse and also lingering effect on trade between belligerent and neutral countries

Table 4.1: Estimated average effect of a military conflict on trade (from Glick and Taylor 2010)

Years after the war	Reduction in trade between adversaries	Reduction in trade between a belligerent and a neutral[11]
0	85%	12%
1	73%	7%
2	74%	4%
3	68%	5%
4	52%	9%
5	43%	7%
6	32%	9%
7	21%	5%
8	21%	Insignificant
9	10%	Insignificant
10	3%	Insignificant

Source: Glick and Taylor (2010: 111).

The results above can be applied to the aforementioned cases. Drawing on the work of Rose and Spiegel (2004), the bilateral trade data used are deflated using US CPI to provide a close estimate of such trade values in 1985 dollars[12]. The export and import flows (in 1985 US$) are then averaged to arrive at an indicator of bilateral trade flow that is consistent with the one used in Glick and Taylor (2010). The estimated percentages in Table 4.1 are then

[11] A belligerent for a particular year is a country that is involved in a war (as defined by Glick and Taylor) for that year while a neutral is a country that is not involved in a war during that year.

[12] In this case, $Rtrade_t = \frac{Ntrade_t}{\left({}^{CPI_t}/_{CPI_{1985}}\right)}$, where $Rtrade_t$ is the value of trade flow in 1985 prices, $Ntrade_t$ is the value of trade flow in current prices, CPI_t is the US CPI for year t, and CPI_{1985} is the US CPI for the year 1985. The World Development Indicators serve as the source of data on US CPI (with 2000 = 100).

applied to determine the foregone bilateral trade between two countries assuming a conflict occurs between them in 2005. The cost of foregone bilateral trade is estimated using data from 2005 to 2015 to take into account the possible lagged effects of such conflict

The cumulative cost of a one-year military conflict can be considered as significant, ranging from around US$ 27.263 billion (for China-Vietnam case) to US$ 39.088 billion (for Indonesia-China case), all of which are expressed in 1985 US dollars (see Table 4.2). A comparison of the said figures with the estimated GDP (in 1985 dollars) of the countries included in the analysis in 2005 provides a clearer picture of the potential extent of the cost of such type of conflict.

Table 4.2: Foregone bilateral trade and 2005 GDP (expressed in 1985 prices) based on Glick and Taylor's (2010) estimates

Cases	GDP_China (1985 dollars)	GDP_Partner (1985 dollars)	Cumulative Foregone Average Trade (1985 dollars)	Foregone Trade (% of China's GDP)	Foregone Trade (% of partner country's GDP)
China and Indonesia	1,939,179,764,860.39	234,727,883,733.90	39,088,140,898.84	2.02%	16.65%
China and Philippines		64,282,187,398.49	32,470,414,511.99	1.67%	50.51%
China and Vietnam		51,583,497,063.80	27,262,897,857.89	1.41%	52.85%
Total Foregone Average Trade			98,821,453,268.72		

Note: A country's GDP for a particular year can be expressed in 1985 dollars by applying the relevant real GDP growth rate figures of the said country (from the World Development Indicators) to the country's GDP (expressed in current dollars) in 1985. For a justification of the said methodology, please refer to the following link: https://www.imf.org/external/pubs/ft/weo/faq.htm#q3c

Source: Authors' calculations using data from UN Comtrade Database.

While the estimated cumulative foregone average trade flow is equivalent to a much larger proportion of Philippines' and Vietnam's respective GDPs, the estimated cost figures can also be considered as significant in China's and Indonesia's respective cases. China's defense spending in 2005 is equivalent to around US$ 39.089 billion (in 1985 US dollars)[13],

[13] It is estimated that defense spending accounts for approximately 2.02 percent of China's GDP in 2005, and the said figure was applied to the estimated GDP in 1985 dollars in 2005 (source of data: World Development Indicators).

which is marginally larger than the estimated cumulative foregone average trade flow between China and Indonesia. However, assuming that military conflicts among the three country pairs considered all occurred in 2005, the total foregone trade from these conflicts is around US$ 98.821 billion (in 1985 US dollars) which is more than 2.5 times as large as China's defense spending (also in 1985 US dollars).

In the case of Indonesia, the cumulative foregone average trade in a hypothetical conflict with China is equivalent to more than 16 percent of the country's GDP in 2005 (expressed in 1985 US dollars), which is larger than the estimated contribution of agriculture sector on Indonesia's total GDP in 2005 (at 13.1 percent of GDP[14]). Furthermore, the estimated costs do not include the value of foregone bilateral trade between each of the countries considered (China, Indonesia, Philippines and Vietnam) and other countries that are neutral to the hypothetical military conflicts (see Appendix 1 for more details on the estimated foregone average trade flow for each country pair considered) .

Li and Sacko (2002), on the other hand, estimate that the onset of unexpected military conflict between two countries is associated with a 12 percent reduction in trade using a post-World War sample of 20 countries from 1949 to 1992, and a 6.5 percent reduction in trade using a larger sample of 56 countries from 1870 to 1992. For each country pair, the authors used the total value of trade between the two countries (in current US dollars) as their trade indicator, and that their indicator for the onset of unexpected military conflict is lagged by one year. Assuming that hypothetical military conflict occurs for each country pair considered in 2005, the findings by Li and Sacko (2002) can be used to come up with an alternative estimate of the value of foregone trade in 2006.

Table 4.3(a): Foregone trade in 2006 based on Li and Sacko's (2002) estimates (post-war sample)

Cases	Total bilateral trade in 2006 (current US$)	Estimated foregone trade in current US$ (post-war sample)	Foregone total trade in 1985 US$ (post-war sample)	Foregone average trade in 1985 US$ (post-war sample)
China and Indonesia	19,055,455,016.00	2,286,654,601.92	1,220,506,974.49	610,253,487.25
China and Philippines	23,412,695,541.00	2,809,523,464.92	1,499,589,391.88	749,794,695.94

[14] Figure is from World Development Indicators.

China and Vietnam	9,949,431,315.00	1,193,931,757.80	637,263,728.52	318,631,864.26
Total foregone average trade				1,678,680,047.45

Source: Authors' calculations using data from UN Comtrade Database.

Table 4.3(b): Foregone trade in 2006 based on Li and Sacko's (2002) estimates (larger sample)

Cases	Total bilateral trade in 2006 (current US$)	Estimated foregone trade in current US$ (larger sample)	Foregone total trade in 1985 US$ (larger sample)	Foregone average trade in 1985 US$ (larger sample)
China and Indonesia	19,055,455,016.00	1,238,604,576.04	661,107,944.52	330,553,972.26
China and Philippines	23,412,695,541.00	1,521,825,210.17	812,277,587.27	406,138,793.64
China and Vietnam	9,949,431,315.00	646,713,035.48	345,184,519.62	172,592,259.81
Total foregone average trade				909,285,025.70

Source: Authors' calculations using data from UN Comtrade Database.

As Tables 4.3(a) and 4.3(b) show, the estimated foregone average trade (in 1985 dollars) due to onset of an unexpected military conflict ranges from US$ 318.632 million (China and Vietnam case) to US$ 749.795 million (China and Philippines case) using the post-war sample estimate, and from US$ 172.592 million (China and Vietnam) to US$ 406.139 million (China and Philippines) using the larger sample estimate[15]. These correspond to total estimated foregone average trade (in 1985 dollars) of around US$ 1.679 billion (using the post-war sample) and US$ 909.285 million (using the larger sample) among the country pairs considered, both of which are smaller than the total foregone average trade estimated based on results in Glick and Taylor (2010).

On the other hand, Brutger and Wright (2014) examine the implications of a territorial dispute, along with the potential armed conflict that can arise, on bilateral trade. They find that a territorial dispute between two countries is associated with a 55 percent decline in the value of their total bilateral trade (expressed in 2000 US$) in a given year, and that if the territorial dispute is accompanied by a military dispute, the marginal effect increases to 82 percent.

[15] Dividing total foregone bilateral trade figures (in 1985 dollars) by 2 yields the corresponding values for the average foregone bilateral trade (in 1985 dollars).

Table 4.4(a): Foregone trade in 2005 due to a territorial dispute based on Brutger and Wright's (2014) estimates

Cases	Total Bilateral Trade 2005 (2000 US$)	Estimated foregone trade due to a territorial dispute (2000 US$)	Estimated foregone trade due to a territorial dispute (1985 US$)	Estimated average foregone trade due to a territorial dispute (1985 US$)
China and Indonesia	14,802,361,957.18	8,141,299,076.45	5,087,129,968.79	2,543,564,984.40
China and Philippines	15,481,307,617.27	8,514,719,189.50	5,320,463,326.31	2,660,231,663.16
China and Vietnam	7,227,538,847.57	3,975,146,366.16	2,483,889,367.01	1,241,944,683.51
Total foregone average trade				6,445,741,331.06

Source: Authors' calculations using data from UN Comtrade Database.

Table 4.4 (b): Foregone trade in 2005 due to territorial and maritime disputes based on Brutger and Wright's (2014) estimates

Cases	Total Bilateral Trade 2005 (2000 US$)	Estimated foregone trade due to territorial and military disputes (2000 US$)	Estimated foregone trade due to territorial and military disputes (1985 US$)	Estimated average foregone trade due to territorial and military disputes (1985 US$)
China and Indonesia	14,802,361,957.18	12,137,936,804.89	7,584,448,317.11	3,792,224,158.56
China and Philippines	15,481,307,617.27	12,694,672,246.16	7,932,327,141.04	3,966,163,570.52
China and Vietnam	7,227,538,847.57	5,926,581,855.00	3,703,253,238.09	1,851,626,619.05
Total foregone average trade				9,610,014,348.12

Source: Authors' calculations using data from UN Comtrade Database.

Tables 4.4 (a) and 4.4 (b) show an alternative estimate of the cost of hypothetical conflict for each of the three country pairs, based on findings by Brutger and Wright (2014). The estimated average trade costs are larger relative to the corresponding figures in Tables 4.3(a) and 4.3 (b) (based on Li and Sacko (2002)'s analysis). These include the estimated foregone average trade flow (in 1985 dollars) due to presence of a territorial dispute only, which ranges from US$ 1.242 billion in the case of China and Vietnam to US$ 2.66 billion in the case of China and the Philippines.

5. Conclusion

The economic costs associated with military conflicts among states are myriad and vary greatly in their size and extent. These costs depend on factors such as the initial wealth of the countries involved, the intensity and protractedness of the conflict, and how well the risks of conflict re-emergence is managed. Much of the existing literature in this area finds evidence suggesting the presence of the effect of such armed disputes on trade and foreign investment as well as on development outcomes. And based on the evidence, it is possible for such impacts to last well beyond the conflict years—notably when the risk of conflict remains and the underlying factors were not fully resolved.

While the literature is not unanimous with regards to the presence of possible adverse effect of armed conflict on some economic outcomes (e.g. Koubi, 2005; Miguel and Roland, 2011), this does not mean that war can be a socially desirable option. As noted by Miguel and Roland (2011:3-4), one cannot discount the humanitarian costs and the short-run but disruptive effects of a military conflict on the economy. Furthermore, some studies find evidence suggesting that territorial dispute in itself can hamper trade, and some documented cases suggest that territorial disputes have adversely affected the livelihood of small-scale fishermen and other segments of the population who significantly depend on the resource endowments of the disputed area. Such is the case of the West Philippine Sea/South China Sea in which various countries have overlapping and competing claims. There are concerns that the presence of a number of territorial and maritime disputes in the area can lead to armed conflict.

Based on the review of evidence herein, the costs of conflict in terms of foregone average trade among the country pairs considered in the West Philippine Sea/South China Sea (in 1985 dollars) —which differ in important ways but hint at some common channels of impact—could range from US$ 909.285 million to US$ 98.821 billion. More broadly, the impacts on a disrupted global production chain can easily amplify these costs even further, affecting global growth prospects for many decades, according to experience.

While the settlement of territorial and maritime disputes is typically fraught with a lot of difficulty, events in the past show that it is still possible for conflicting parties to cooperate with regards to management of common resources. In a review of 14 cases of international cooperation (some of which were and are engaged in territorial and maritime disputes), Mendoza and Siriban (2014) find that many of such initiatives have utilized financing and burden-sharing mechanisms, including the use of side payments. In some cases, stakeholder countries have engaged in cooperation in their research initiatives, in turn enabling and sustaining cooperation with regards to management of shared resources. Many resources in the

disputed areas (such as those found in marine ecosystems typically intertwined with other marine ecosystems) are characterized by a significant amount of externalities.

As such, the management of resources in disputed areas (especially marine resources) can be viewed as regional public goods, in which case the externalities associated with the provision of such good can only be properly internalized through collective action (Mendoza and Siriban, 2014:31-33).

References

Akresh, R., L. Lucchetti and H. Thirumurthy. 2012. "Wars and child health: Evidence from the Eritrean-Ethiopian conflict." Journal of Development Economics 99: 330-340.

Anderton, C. and J. Carter. 2001. "The Impact of War on Trade: An Interrupted Time-Series Study". Journal of Peace Research 38(4): 445-457.

APEC Policy Support Unit. 2013. Global Supply Chain in the APEC Region: Case Study of the Electrical and Electronics Industry. APEC PSU, APEC Secretariat, Singapore.

Athukorala, P. 2010. Production Networks and Trade Patterns in East Asia: Regionalization or Globalization? Working Paper no. 56, ADB Working Paper Series on Regional Economic Integration.

Barbieri, K. and J. Levy. 1999. "Sleeping with the Enemy: The Impact of War on Trade." Journal of Peace Research 36:463–79.

Brutger, R. and A. Wright. 2014. "The Costs of Conflict: Border Disputes and Trade Diversion." Mimeo [http://www.austinlwright.com/wp-content/uploads/2014/09/Borders.pdf].

Burke, L., Selig, E. and M. Spalding. 2002. Reefs at Risk in Southeast Asia. World Resources Institute, Washington, DC.

Bussmann, M. 2010. "Foreign direct investment and militarized international conflict." Journal of Peace Research 47(2): 143-153.

Cashman, G. and LC Robinson. 2007. *An Introduction to the Causes of War.* Plymouth, UK: Rowman and Littlefield Publishers, Inc.

Che, Y., J. Du, Y Lu and Z Tao. 2015. Once an enemy, forever an enemy? The long-run impact of the Japanese invasion of China from 1937 to 1945 on trade and investment. Journal of International Economics 96: 182-198.

Cheewatrakoolpong, K., C. Sabsahari and N. Bunditwattanawong. 2013. Impact of the ASEAN Economic Community on ASEAN Production Networks. ADBI Working Paper Series No. 409

Dunne, JP, RP Smith and D Willenbockel. 2005. "Models of Military Expenditure and Growth: A Critical Review." Defense and Peace Economics 16(6):449-61.

Dyck AJ and UR Sumaila. 2010. Economic impact of ocean fish populations in the global fishery. *Journal of Bioeconomics* 12(3): 227-243.

FAO. 2002. The state of world fisheries and aquaculture 2002. FAO, 2002

Fearon, JD. 1995. "Rationalist Explanations for War." *International Organization* 49, 3: 379-414.

Glaser, B. 2012. “Armed Clash in the South China Sea.” Contingency Planning Memorandum No. 14, Council on Foreign Relations [http://www.cfr.org/world/armed-clash-south-china-sea/p27883].

Glick, R. and A. Taylor. 2005. “Collateral Damage: Trade Disruption and the Economic Impact of War.” Working Paper no. 11565, National Bureau of Economic Research.

Goldin, C. and F. Lewis. 1975. “The Economic Cost of the American Civil War: Estimates and Implications.” Journal of Economic History 35 (June):299–326.

Harris, G. 1999. “The costs of armed conflict in developing countries.” In Recovery from Armed Conflict in Developing Countries: An economic and political analysis, Ed. G. Harris. London and New York: Routledge.

Hensel, P. 2000. “Territory: Theory and Evidence on Geography and Conflict.” In *What Do We Know about War?* Ed. JA Vasquez. Boulder, CO: Rowman and Littlefield.

----------. 1996. “Charting a Course to Conflict: Territorial Issues and Interstate Conflict, 1816-1992.” Conflict Management and Peace Science 15(1): 43-73.

----------. 1999. “Charting a course to conflict: Territorial issues and interstate conflict, 1816-1992.” In *The Road to War*, ed. Paul Diehl. Nashville, TN: Vanderbilt University Press, 115-46.

Huth, P. 1998. Standing Your Ground: Territorial Disputes and International Conflict. University of Michigan Press.

Ichino, A. and R. Winter-Ebmer. 2004. “The Long-Run Educational Cost of World War II.” Journal of Labor Economics 22(1): 57-87.

International Monetary Fund. 2016. World Economic Outlook: Frequently Asked Questions. [https://www.imf.org/external/pubs/ft/weo/faq.htm#q3c]

Jensen, NM. 2006. Nation-States and the Multinational Corporation: Political Economy of Foreign Direct Investment. Princeton: Princeton University Press.

Jensen, N and DJ Young. 2008. A violent future? Political risk insurance markets and violence forecasts. Journal of Conflict Resolution 52(4): 527-547.

Kastner, S. 2007. “When Do Conflicting Political Relations Affect International Trade.” Journal of Conflict Resolution 51(4): 664-688.

Koubi, V. 2005. “War and Economic Performance.” Journal of Peace Research 42(1): 67-82.

Lee, H. 2014. Does Armed Conflict Reduce Foreign Investment in the Petroleum Sector? Foreign Policy Analysis: 1-24

Li, Q. 2006. Chapter 11: Political Violence and Foreign Direct Investment. In Research in Global Strategic Management 12: 231-255.

Li, Q and D Sacko. 2002. The (Ir)Relevance of Militarized Interstate Disputes on International Trade. International Studies Quarterly 46: 11-43.

Li, Q. and T. Vaschilko. 2010. "Dyadic military conflict, security alliances and bilateral FDI flows." Journal of International Business Studies 41: 765-782.

Luard, E. 1970. *The International Regulation of Frontier Disputes*. New York: Praeger.

Mendoza, R.U. 2012. "South China Sea: Heavy Price of Conflict." *Rappler*. [http://www.rappler.com/thought-leaders/4390-south-china-sea-the-heavy-price-of-conflict].

Mendoza, R.U. and C.I.S. Siriban. 2014. Regional Public Goods in the Blue Economy: Synthesis of Lessons from 14 Cases of International Cooperation. Journal of Asian Business 25(2-3): 29-53.

Miguel, E. and G. Roland. 2011. The long-run impact of bombing Vietnam. Journal of Development Economics 96: 1-15.

Morrow, J., R. Siverson, and T. Taberes. 1998. "The Political Determinants of International Trade: The Major Powers, 1907–1990." American Political Science Review 92 (September): 649–61.

Olson, M. 1982. *The Rise and Decline of Nations*. New Haven: Yale University Press.

Organski, A.F.K. and J. Kugler. 1977. "The Costs of Major Wars: The Phoenix Factor." American Political Science Review 71(4): 1347-1366.

Polacheck, S. and D. Sebastianova. 2010. "Does Conflict Disrupt Growth? Evidence of the Relationship between Political Instability and National Economic Performance." IZA Discussion Paper no. 4762.

Pollins, B. 1989. Conflict, Cooperation and Commerce: The Effect of International Political Interactions on Bilateral Trade Flows. American Journal of Political Science 33(3): 737-761.

PSA-NSCB (2014b) 2012 Official Poverty Statistics for the Basic Sectors.

Rose, A.K. and Spiegel, M.M., 2004. A gravity model of sovereign lending: trade, default, and credit. *IMF Economic Review*, 51(1): 50-63.

Ruttan, V. W. 2006. *Is War Necessary for Economic Growth? Military Procurement and Technology Development*. Oxford: Oxford University Press.

Schultz, K. 2015. Borders, Conflict and Trade. Annual Review of Political Science 18: 125-145.

Simmons, B. 2005. "Rules over Real Estate: Trade, Territorial Conflict, and International Borders as Institution." The Journal of Conflict Resolution 49(6): 823-848.

Spich, R. and R. Grosse. 2005. How does homeland security affect U.S. firms' international competitiveness? Journal of International Management 11(4): 457-478.

Stewart, F. 1993. "War and underdevelopment: can economic analysis help reduce the costs?" Journal of International Development 5(4): 357-380.

Vasquez, J. 1993. *The War Puzzle*. Cambridge: Cambridge University Press.

West, T. 2006. "Failed Deterrence: The 1979 Sino-Vietnamese Conflict." Stanford Journal of East Asian Affairs 6(1): 73-85.

Wiegand, K. 2011. *Enduring Territorial Disputes: Strategies of Bargaining, Coercive Diplomacy and Settlement*. University of Georgia Press.

World Bank. 2016. World Development Indicators

Yamarik, S., N. Johnson and R. Compton. 2010. "War! What Is It Good For? A Deep Determinants Analysis of the Cost of Interstate Conflict." Peace Economics, Peace Science and Public Policy 16(1): 1-33.

References for Table 2.1 and *Box 3.1*

Alnasrawi, A. 1992. "Iraq: economic consequences of the 1991 Gulf War and future outlook." Third World Quarterly 13(2): 335-352.

Associated Press. 2013. "Filipino fishermen pay price of disputes." Inquirer.net, May 23 [http://globalnation.inquirer.net/75345/filipino-fishermen-pay-price-of-sea-disputes]

Castro, I. 2012. "Nicaragua's Ortega expects Colombia to accept border ruling." Reuters.com, November 23. [http://www.reuters.com/article/nicaragua-colombia-idUSL1E8MO04F20121124]

Colombage, D. 2014. "Fishing issue clouds India and Sri Lanka ties." Al Jazeera June 10. [http://www.aljazeera.com/indepth/features/2014/06/fishing-issue-clouds-india-sri-lanka-ties-2014691244367569.html]

Cupin, B. 2015. "From Masinloc to The Hague: A Question of Livelihood" Rappler.com [http://www.rappler.com/nation/98783-masinloc-zambales-china-scarborough-shoal]

Freedman, L. 1982. "The War of the Falkland Islands, 1982." Foreign Affairs 196-210.

Huy, D. 2011. Ngudan bi tau ca Trung Quocchiemngutruong [Fishermen lost fishing grounds to Chinese fishing ships]. *Thanh Nien*, May 29.

Mendoza, R.U. 2012. "South China Sea: Heavy Price of Conflict." *Rappler*. [http://www.rappler.com/thought-leaders/4390-south-china-sea-the-heavy-price-of-conflict].

Mofid, H. 1990. *The Economic Consequences of the Gulf War*. London: Routledge.

Paterson, P. and R. Flynn. 2013. “Border Disputes in Latin America.” Regional Insights, William J. Perry Center for Hemispheric Defense Studies. [http://chds.dodlive.mil/files/2013/12/pub-RI-paterson.pdf]

Path, K. 2011. The Sino-Vietnamese Dispute over Territorial Claims, 1974-1978: Vietnamese Nationalism and its Consequences. International Journal of Asian Studies 8(2): 189-220.

Seddiq, R. 2001. “Border Disputes on the Arabian Peninsula.” Policy Watch 525, The Washington Institute [http://www.washingtoninstitute.org/policy-analysis/view/border-disputes-on-the-arabian-peninsula]

Shaaban, A. 2013. “Iran releases 13 UAE fishermen.” Khaleej Times, June 22. [http://www.khaleejtimes.com/article/20130622/ARTICLE/306229889/1002]

Shebabi, M. 2015. “An Extraordinary Recovery: Kuwait Following the Gulf War.” Discussion Paper no. 15.20, University of Western Australia.

Simmons, B. 1999. Territorial Disputes and Their Resolution: The Case of Ecuador and Peru. United States Institute of Peace.

The Economist. 2012. “Hot waters.” November 29 [http://www.economist.com/blogs/americasview/2012/11/colombia-and-nicaragua]

The New York Times. 1982. “War in Falklands Cost Britain $ 1.19 Billion.” October 27. [http://www.nytimes.com/1982/10/27/world/war-in-falklands-cost-britain-1.19-billion.html]

Tuan, H.A. 2012-13. “The Tragedy of Vietnamese Fishermen: The Forgotten faces of Territorial Disputes in the South China Sea.” Asia Journal of Global Studies 5(2): 94-107.

Yardley, J. 2012. “Two Hungry Nations Collide over Fishing.” The New York Times, September 4 [http://www.nytimes.com/2012/09/05/world/asia/sri-lanka-and-india-battle-over-fishing-grounds.html?_r=0].

Appendix 1: Estimated foregone average bilateral trade, 2005 to 2015 (based on estimated average effects by Glick and Taylor (2010)

The tables below show the estimated foregone average trade flow due to hypothetical military conflict among the country pairs considered. The 1985 trade figures are derived by deflating the values of trade flows from 2005 to 2015 using US CPI figures. The foregone average trade figures are based on the average effects estimated by Glick and Taylor (2010) of a military conflict on trade between belligerent countries. In this case, 2005 is year 0 (which means that the hypothetical conflict occurred in 2005), while 2006 is year 1, and so on.

Table A1: Bilateral trade (current and constant) and foregone trade from a hypothetical military conflict: China and Indonesia

Year	Imports by China from Indonesia (1985 dollars)	Exports to Indonesia by China (1985 dollars)	Average trade (1985 dollars)	Foregone average trade (1985 dollars)
2005	4,648,518,442.59	4,600,808,773.39	4,624,663,607.99	3,930,964,066.79
2006	5,127,086,784.01	5,043,804,670.11	5,085,445,727.06	3,712,375,380.75
2007	6,468,279,298.20	6,588,392,093.22	6,528,335,695.71	4,830,968,414.83
2008	7,158,058,006.49	8,592,464,549.55	7,875,261,278.02	5,355,177,669.05
2009	6,853,004,405.01	7,383,058,005.81	7,118,031,205.41	3,701,376,226.81
2010	10,261,434,748.27	10,833,038,470.24	10,547,236,609.26	4,535,311,741.98
2011	14,990,142,780.56	13,977,883,971.69	14,484,013,376.12	4,634,884,280.36
2012	14,966,912,825.88	16,067,900,660.50	15,517,406,743.19	3,258,655,416.07
2013	14,514,486,226.30	17,057,737,192.96	15,786,111,709.63	3,315,083,459.02
2014	11,133,283,185.61	17,753,342,249.47	14,443,312,717.54	1,444,331,271.75
2015	8,995,315,188.04	15,605,549,572.90	12,300,432,380.47	369,012,971.41
Total from 2005-2015 (1985 dollars)			114,310,251,050.40	39,088,140,898.84

Source: Authors' calculations using data from UN Comtrade Database.

Table A2: Bilateral trade (current and constant) and foregone trade from a hypothetical military conflict: Philippines and China

Year	Imports by China from the Philippines (1985 dollars)	Exports to Philippines by China (1985 dollars)	Average trade (1985 dollars)	Foregone average trade (1985 dollars)
2005	7,090,822,234.31	2,582,747,449.88	4,836,784,842.10	4,111,267,115.78
2006	9,433,836,209.14	3,062,742,056.55	6,248,289,132.85	4,561,251,066.98
2007	11,996,961,622.90	3,906,839,075.67	7,951,900,349.28	5,884,406,258.47
2008	9,747,729,142.74	4,563,941,721.97	7,155,835,432.35	4,865,968,094.00
2009	5,991,764,985.22	4,305,618,737.09	5,148,691,861.16	2,677,319,767.80
2010	8,003,922,906.89	5,694,577,021.13	6,849,249,964.01	2,945,177,484.52
2011	8,606,652,836.06	6,819,087,143.89	7,712,869,989.97	2,468,118,396.79

2012	9,205,857,547.49	7,841,609,343.92	8,523,733,445.70	1,789,984,023.60
2013	8,397,962,351.53	9,176,841,744.98	8,787,402,048.26	1,845,354,430.13
2014	9,536,275,338.32	10,669,379,444.94	10,102,827,391.63	1,010,282,739.16
2015	8,634,500,637.88	12,117,841,678.23	10,376,171,158.05	311,285,134.74
Total from 2005-2015 (1985 dollars)			83,693,755,615.37	32,470,414,511.99

Source: Authors' calculations using data from UN Comtrade Database.

Table A3: Bilateral trade (current and constant) and foregone trade from a hypothetical military conflict: China and Vietnam

Year	Imports by China from Vietnam (1985 dollars)	Exports to Vietnam by China (1985 dollars)	Average trade (1985 dollars)	Foregone average trade (1985 dollars)
2005	1,406,539,088.79	3,109,623,396.68	2,258,081,242.74	1,919,369,056.33
2006	1,326,948,748.94	3,983,582,322.09	2,655,265,535.51	1,938,343,840.93
2007	1,674,273,032.75	6,172,881,838.85	3,923,577,435.80	2,903,447,302.49
2008	2,167,126,530.22	7,557,466,686.19	4,862,296,608.20	3,306,361,693.58
2009	2,380,704,501.41	8,175,645,227.13	5,278,174,864.27	2,744,650,929.42
2010	3,446,400,759.46	11,399,517,176.30	7,422,958,967.88	3,191,872,356.19
2011	5,317,609,947.43	13,915,996,842.80	9,616,803,395.12	3,077,377,086.44
2012	7,605,836,948.08	16,033,849,731.27	11,819,843,339.68	2,482,167,101.33
2013	7,802,156,625.03	22,441,411,145.88	15,121,783,885.45	3,175,574,615.95
2014	9,044,951,228.95	28,966,878,344.70	19,005,914,786.83	1,900,591,478.68
2015	11,407,383,888.21	30,135,442,549.50	20,771,413,218.86	623,142,396.57
Total from 2005-2015 (1985 dollars)			102,736,113,280.34	27,262,897,857.89

Source: Authors' calculations using data from UN Comtrade Database.

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