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How Much is that War in the Window? An Investigation into the Costs of War

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HOW MUCH IS THAT WAR IN THE WINDOW?
AN INVESTIGATION INTO THE COSTS OF WAR

by

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ABSTRACT

This thesis examines the effects of war on a state's economy. The Liberal Theory of international relations maintains that there are costs to war in terms of trade; in line with this argument, many researchers have suggested that trading partners are less likely to war with each other out of a fear of disrupting their trade, which would in turn disrupt their economies. Due to issues of elasticity and substitution, however, overall trade may not significantly decline during war. Additionally, there are known economic costs of war, such as debt. If war truly does have costs, then, it must be more in terms of costs to the national economy, rather than trade. This work examines the theory that war has costs to the economies of war initiators, and samples the economies of war initiators from the mid-nineteenth century to the late twentieth century. This paper uses a time series analysis and tests for anterior, concurrent, and posterior effects of war initiation on national economies, and uses a time period of up to twenty years before and after each war event. The results indicate that there are, in general, no negative effects of war on a state's economy: only one case had a significant negative result, while two had significant positive results; these two positive cases, however, also had strong evidence of autocorrelation. These results pose a challenge to the Liberal Theories of International Relations.

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INTRODUCTION

Many scholars have researched the relationship between trade and conflict. While some have found that trade tends to increase the likelihood of conflict (see, for example, Barbieri 1996), most have found that it is more likely to promote peace (see Haftel 2007; McDonald 2004; Oneal and Russett 1999). There have also been those who, though they may not have performed any testing in an individual work, have theorized on the subject and come down on one side or the other (see Angell [1909] 1933; Rosecrance 1986; Waltz 1979). Comparatively few, however, have analyzed whether conflict has an effect on trade (for exceptions, see Anderton and Carter 2001; Barbieri and Levy 1999; and Keshk, Pollins, and Reuveny 2004). Most studies that have examined this topic have found that war decreases trade (Anderton and Carter 2001; Li and Sacko 2002; Oneal, Russett, and Berbaum 2003). What has garnered even less attention in the field is whether traders (be they private actors or states) begin to reduce their involvement in trade when observable signs of tension may indicate that a war is on the horizon (one important exception to this being Long 2008).

There has been no research (that I have come across), however, into how strong the costs of war actually are. This is an important question to analyze, as its answer is directly relevant to a major theory of international relations. Liberal Theory maintains that war disrupts trade, and that this disruption will ultimately harm a state's economy. The idea behind this is that when State *i* goes to war with State *j*, a trading partner, each state loses a source of important resources and material goods, and that this sudden lack of traded goods will in turn have a negative effect on the economy. Among liberal theorists, then, war is viewed as costly, especially when

occurring between trading partners; liberal theorists argue that this explains why trading partners seldom war with each other.

This proposition—that war has a negative effect on a state's economy due to a decline in trade—has been tested by many scholars throughout the last several decades. A major problem with these tests, however, is the measurement of trade. The easiest and most common way that trade is analyzed in these studies is by observing the amount spent on trade. A problem with this, as noted by Barbieri and Levy (1999), is that commodities prices often change in times of war. Thus, an observed increase in the amount a state spends on trade may not correlate with an increase in actual trade, but rather higher prices for the items being traded. So it cannot be said with certainty that an observed change in trade during wartime is truly a change in trade, when it is only measured by the amount spent.

In line with the Liberal Theory, however, a decline in trade will have a negative effect on a state's economy. It is also important to note that state decision makers are typically believed among political scholars to be rational actors and to pursue the overall success of the economies of their respective states, not to pick and choose specific winners or losers within their respective states. Due to this belief, as well as the belief that a decline in trade will harm a state's overall economy, liberal theorists expect that wars have net costs at the national level. Therefore, a better way to measure a possible economic effect of war would be to look directly at a state's economy, rather than attempting to make determinations based on how much a state spends on trade.

This analysis intends to observe a state's economy to find what effects, if any, war may have on a state's overall economy. I shall use energy consumption as a proxy variable for GDP,

as this information is more readily available for many older cases. As most of the literature on the topic of trade and conflict tends to support the liberal theory—that war has costs—I hypothesize that war will have a negative effect on a state's economy. I will only be looking at war initiators, as defined by the Correlates of War. The idea behind this is that these states made a decision to go to war, presumably expecting that the gains they would achieve through victory would outweigh any costs incurred throughout the duration of the war. The states analyzed, then, participated in wars of choice in that they opted for war, as opposed to those states that were attacked and thus forced into conflict.

This analysis provides a fuller understanding of the economic costs of war, and determines either that war has a negative effect on a state's economy, or that war has a positive or nil effect on a state's economy. If the costs of war are found to be strong, then Liberal Theory would appear to be supported, whereas Liberal Theory would not be supported if the costs of war are found to be weak, as this would indicate that there may be low costs of war. This analysis, then, obtains a more direct answer to an important question in the field of international relations.

Time series analysis is used to determine whether a war had a positive, a negative, or no effect on a state's economy. The model in this analysis is based on that used by Mousseau and Shi (1999) in their test of the Democratic Peace Theory so that the model accounts for both anterior and posterior effects of war. The sample was slowly winnowed down from all war initiators in the Correlates of War Interstate War dataset to eleven cases. For the time series model to work properly, cases were eliminated due to other wars taking place too close chronologically to the war being analyzed, or due to lack of data on energy consumption.

The results of the analysis appear to indicate neither positive nor negative costs of war. Of the eleven cases tested, only three reached significance, and of these three, only one did not have strong evidence of autocorrelation. This one case, though, did have the hypothesized outcome. Finding a negative effect in only one case out of eleven, however, does not offer strong support for the Liberal Theory.

This thesis continues after this introduction first by examining past literature on the relationship between trade and peace (both Realist and Liberal arguments), and then discussing past research on the various costs of war. Next is an explanation of the methods used in the study, followed by brief descriptions of each war that was ultimately included in this analysis. Following this is a description and discussion of the results, followed by concluding remarks.

LITERATURE REVIEW, THEORY, & HYPOTHESIS

Literature Review

Much research has been devoted to determining whether a relationship exists between trade and conflict. The Liberal viewpoint—in short, that states which trade with each other are less likely to go to war with each other—has much more support in the literature than does the Realist viewpoint—that states which trade either are more likely to go to war with each other or are neither more nor less likely to go to war with each other. The Liberal viewpoint rests on the assumption that war will disrupt trade and, in turn, the economy. This assumption, however, has not been widely, if at all, tested. Before testing, though, it will be helpful to review the literature on the relationship between trade and conflict.

Realist Arguments

Though, as stated, much of the research on the relationship between trade and conflict has found that trade helps to promote peace, some scholars have theorized or found the opposite to be true. Among the most well-known critics of the Liberal Trade Theory is Waltz, who describes interdependence as "mutual vulnerability" (Waltz 1979). That is, in order to become interdependent, states must give up complete autonomy, because they are then dependent on resources coming in from another state. Dorussen (1999) further explains that states prefer control over resources to lack thereof, and that this desire for control inevitably leads to conflict. Dorussen also finds that any pacifying effect trade may have decreases as the number of participating states increases. Similarly, Waltz (1979) argues that states' commitment to an organization decreases as membership increases, concluding then that states are better off in smaller groups than larger groups. Waltz (1979) further claims that international organizations

will generally have difficulty maintaining policies because each member state pursues its own interests when they conflict with those of the group.

Along similar lines, Barbieri (1996) finds empirically that interdependence has a positive effect on conflict. She also observes, however, no effect on the likelihood of war. A problem with her research, though, is that she did not control for major powers; later studies have done so and found that interdependence does reduce the likelihood of conflict and war. She also analyzes only disputes and wars from 1870 through 1938, leaving any data from the post-World War II era unaccounted for.

Gasiorowski (1986), in an earlier work, attempts to differentiate between the effects of what he argues are the costly aspects of interdependence (such as overdependence and vulnerability to embargoes) and its beneficial components (such as specialization and a more efficient economy). He finds that the costly aspects tend to increase the likelihood of conflict, whereas the beneficial components tend to decrease the likelihood of conflict. He concludes that because there exist costly aspects, however, interdependence is necessarily costly and therefore more likely to increase conflict. He is hopeful for the future, though, claiming that the beneficial components of interdependence are increasing at a faster rate than the costs, and he predicts therefore that this will lead to less conflict in the future.

Liberal Arguments

One of the earliest theorists to posit that an increase in trade would lead to a more peaceful world was Angell ([1909] 1933). His main argument is that states are better off trading as opposed to warring because necessary resources can be obtained more cheaply through the

former rather than through the latter. He supports his claim with examples: while conquering new territory may eliminate competition between countries, he writes, it does not eliminate trade between competing businesses; he explains that factories in Pennsylvania, for example, are in just as much competition with those in Massachusetts as they are with those in Canada. In another argument against conquest, Angell writes that states that conquer still have all of the original citizenry of a defeated territory, and that these people may not be easily swayed to work with their new rulers. He also observes that absorbing the population of a new territory only increases the burden on the state to care for its citizens.

Angell observes that many of his contemporaries believe that reparations will reimburse the victor for the cost of a war in the event that a conquering state does not absorb new territory. He argues, however, that indemnities in fact run on the premise that there will be a market for any foreign goods being imported, which, he writes, is not always the case. He explains this further by writing that foreign investment only exists when there is already a market for it, and that there will often not be a market for a victorious state's goods in a conquered state because the latter already has its own factories and products, and will not need those of another state. In addition to the lack of a new market, if a state absorbs new territory after a war, it is also absorbing any factories that already exist in that territory, which only serves to increase competition within the newly enlarged country.

Like Angell, Rosecrance (1986) also believes that states can more cheaply obtain resources through trade rather than war. He argues that nuclear weapons, especially, have made war too costly for any state to pursue, in both financial and human terms. In response to those who claim that the First World War disproves the Liberal Hypothesis, Rosecrance notes that

trade was often restricted by the implementation of tariffs in the face of economic recession in the decades before the war. McDonald (2004) agrees with this point, writing that the extensive amount of trade in the decades before World War I was due not to an ideal of free trade, but to lower shipping costs resulting from technological advances.

Rosecrance further argues that trade allows for specialization within states—allowing the domestic economy to function better—a point also noted by Weede (1996). Weede argues that, in addition to specialization, free trade lowers prices and helps to keep both domestic and international peace, whereas tariffs and other trade barriers necessarily give rise to price distortion and a generally weaker economy.

Rosecrance (1986) goes on to observe that trade also helps states to form alliances, thus offering greater protection against militaristic aggressors. Though states may be generally wary of trade as it involves giving up complete control of their economies as outsiders are able to gain more influence (as noted above by Dorussen 1999 and Waltz 1979), Rosecrance writes that this interdependence means that states are less likely to go to war with each other out of a fear of disrupting their national economies. A study by Oneal, Russett, and Berbaum (2003) supports this claim. In their analysis of the Kantian Tripod (democracy, interdependence, and shared membership in international organizations), they find that states that are highly economically interdependent are roughly one-third less likely to go to war than are non-interdependent states. They find that interstate disputes do disrupt trade, but not usually for more than two years.

Furthering the argument that states want to avoid disruptions to trade, Bearce (2003) argues that states involved in trade groups are less likely to go to war with each other for this same reason. Copeland (1996) agrees that expectations of future trade are relevant to a leader's

decision of whether to go to war. He argues that states that are highly interdependent and that expect trade to continue at high levels are less likely to go to war with each other than if they expect trade levels to decline. Copeland cites Germany on the eve of the two World Wars as an example, writing that war appeared to German leaders as the only remaining option to sustain their state. These leaders, Copeland argues, believed that their territory did not provide enough resources to maintain the population, and that they had few options to obtain resources due to import tariffs and other powers blocking any regional expansions of German influence. McDonald (2009), too, writes that World War I, at least, was partly a result of internal pressures within Germany. This harkens back to Angell's ([1909] 1933) claim that states can obtain resources through either war or trade.

Bearce (2003) further hypothesizes that the frequency of meetings between state leaders whose states share membership in a trade organization would have a pacifying effect. He applied this in an analysis of both the Gulf Cooperation Council and the Economic Community of West African States, and his arguments were later supported empirically by Bearce and Omori (2005) and Haftel (2007). But meetings between high level officials are not the only manner in which states interact. Keohane and Nye (1989) and Morrow (1999) both observe that there are multiple levels on which states interact, including that of private actors.

Alternatively, Li and Reuveny (2011) find that it is not trade alone that can reduce the likelihood of conflict, but that such an effect is dependent upon the sector of trade in which two states are involved. They argue that the reason specific imports or exports reduce the likelihood of conflict is due to the expectation of the aggressor that prices of traded commodities will change. They determine that a state is more likely to favor war if the war is expected to raise the

prices of its exports and decrease the prices of its imports. They note that the opposite also appears to be true: that a state is less likely to favor war if it believes the conflict will cause the price of its imports to rise and the price of its exports to drop.

Effects of War on Trade

In addition to the finding that trade increases the likelihood of conflict, Barbieri and Levy (1999) find that trade actually increases between enemies during times of conflict. This would indicate, however, that war does not disrupt trade, thus invalidating one of the three main premises of the Liberal Trade Theory (Anderton and Carter, 2001). The authors acknowledge, though, that they were only able to analyze seven dyads, and that the measured increase in trade could merely be the result of higher prices, rather than an increase in the actual amount of items traded. Anderton and Carter (2001) refute the findings of Barbieri and Levy (1999). Attempting to correct some of the problems they saw in the Barbieri and Levy article, they use the same model but make a few adjustments, such as controlling for major powers, and find in their analysis that trade decreases during war.

The debate continues in more recent studies. Levy and Barbieri (2004) discuss the theory of why trade should increase during war, and they go on to provide historical examples of such. Reuveny (2001) determines that trade and conflict have a simultaneous relationship, each affecting the other, and that in many cases, conflict leads to an increase in trade. He also finds differences in the trade-conflict relationship between dyads of friendly states and dyads of hostile states. Later, Keshk, Pollins, and Reuveny (2004) test for simultaneity bias in the Liberal Theory. Their results indicate that conflict is much more likely to reduce trade than trade is to reduce conflict. Hegre, Oneal, and Russett (2010), however, write that the results of Keshk,

Pollins, and Reuveny (2004) are spurious, and proceed to present their own data showing that trade does reduce conflict when controlling for size and proximity. They also find that war does reduce trade.

Li and Sacko (2002) appear to be less convinced of simultaneity arguments, noting that firms involved in trade between two countries are not able to predict when a war will start or how long it will last. When a war begins, the authors argue, firms will expect greater risk and accordingly begin to limit their involvement in trade. Kastner (2007) agrees on this point, writing that not only can trade with an enemy during wartime present security risks to the state, but that business leaders may find such trade to be excessively risky. Li and Sacko (2002) further find that trade can decline *ex ante* or *ex post*, depending on firms' expectations of the risks of the start, length, and duration of a conflict. A large decrease in trade on the eve of war, they observe, will mean no decrease during a war; similarly, no decrease before a war means that there will be a decrease during war. Long (2008), too, finds that trade does tend to decrease when traders expect a conflict to begin soon. His data are a bit limited, however, as he only analyzes directed dyads from 1984 through 1997.

The majority of research devoted to the relationship between trade and conflict, then, finds that trade tends to have a pacifying effect, in line with the Liberal Theory. Barbieri and Schneider (1999) observe that Liberal scholars tend to follow the expected utility model, but note that this model neglects strategic interdependence and that it assumes there is only one form of conflict. These authors also write that cooperative models, taking into account the difference between the payoff for one state and that of its partner, ought to be examined when discussing utility function. Despite the great amount of research devoted to the overall relationship between

trade and conflict, Mansfield and Pollins (2001) write that a sufficient theoretical framework is generally lacking. Perhaps a better way to analyze the effect war may have on trade, though, would be to take a closer look at the costs of war. An analysis of the effects that war may have on a state's economy would be a good way to discover more about the costs associated with war, and thus find whether the costs are, in fact, significant enough to deter a state from going to war, as liberal theorists would argue. It would be helpful to the field to give more attention to this topic, as it would provide a better understanding of the full relationship between trade and conflict.

Theoretical Framework

How Trade Starts

Trade starts largely because businesses in one state want to trade with businesses in another state. They want to trade not only to gain a larger market in which to sell their own products, but also so they can buy items that they cannot currently buy and sell those to the people in their own countries. Open trade, then, allows businesses to more easily sell their products abroad, as well as buy foreign products.

States would want to trade in order to improve the economy. Besides bringing in outside products, trade also tends to attract foreign direct investment (Haftel 2007). Another reason for states to pursue open trade may be so that state leaders can secure their own reelections—if there is an exogenous shock to the economy, leaders of states involved in trade can claim that it is beyond their control and not due to anything they themselves have done (Mansfield, Milner, and Rosendorff 2002).

Why Trade Leads to Peace: Costs of War

There are several ways to measure potential costs of war, but there are problems with each (Smith 2014). As Smith (2014) points out, some methods of measurement are subject to researcher bias (e.g., cost-benefit analysis can be measured in a variety of ways), while other methods are subject to data availability (e.g., not all states accurately or publicly report defense spending).

Liberal Trade Theory, however, argues that the main cost of war is the disruption to any economic gains achieved through trade (Anderton and Carter 2001). It can be inferred from this that states at war with each other would generally have lower levels of trade interdependence, an inference that has been supported empirically (see, for example, Anderton and Carter 2001; Hegre, Oneal, and Russett 2010; Li and Sacko 2002; Reuveny 2001).

Some traded resources, however, are more elastic than others. That is, a state can go without certain imports or industries or even replace them with others. Bananas are an example of an elastic commodity, because people can typically survive without bananas. Gasoline, however, is less elastic, in that it is generally more difficult (though of course not impossible) to go without. And so in times of war, a state can more easily substitute elastic resources, or perhaps even find another seller for resources both elastic and inelastic.

If one state is substituting some resources for others or is substituting resources from one state with those of another, however, there may not be an observable change in trade during wartime. That is, while trade may be more limited with an enemy, specifically, during wartime, perhaps trade overall increases or remains level due to receiving imports from a new state. Though Glick and Taylor (2010) find that even neutral states see a decline in trade while others

are at war, these researchers only analyze large scale wars—specifically, the two World Wars. They note that the neutral states suffered this decline due to the fact that the warring states were much larger than those that remained neutral, and these warring states were among the largest trade partners of these neutral states. Although substitution may not have come into play during the two World Wars, it would not be fair to assume without further examination that this is the same for all wars. Additionally, conflict may increase prices of imports and exports (Li and Reuveny 2011). An observable change in spending on trade during conflict, then, may not necessarily mean that there is more or less being traded, but rather only that prices have changed. Any costs associated with war, then, may be more visible in effects on the economy, generally, rather than in effects on trade, specifically.

It is commonly accepted that there are, in fact, economic costs of war, such as debt or changes in GDP per capita (Angell [1909] 1933; Rosecrance 1986). Trading partners are more likely to be peaceful out of a fear of these costs and of disrupting their trade (Bearce 2003). It is generally assumed that conflict makes trade both more difficult and more costly, due to tariffs, embargoes, and other measures that restrict free trade (Polachek 1980). Aside from allowing states to obtain resources more cheaply, trade also allows for specialization within states, which provides for an improved economy (Rosecrance 1986). And it is the economy that states do not want to risk weakening by going to war (Rosecrance 1986).

What all of this comes to, then, is that due to elasticity, substitution, and price variability, it can be difficult to accurately analyze any subtle changes in trade that may occur during conflict. Additionally, war may take a greater (and more observable) toll on a state's economy,

rather than on its trade. This thesis, then, will take a new approach to examine the Liberal Thesis that war has costs to the economies of the nations that start them.

Hypothesis

Based on the predominance of the empirical work supporting the Liberal Theory, it is reasonable to expect that that there are indeed costs associated with war. Though dyads may have low levels of interdependence between themselves during wartime, it is not unreasonable to expect that they will find substitutes either for specific imports or for their former trade partners. So, as stated above, it is likely that costs associated with war will be observable more so in changes in a state's GDP than in changes in a state's levels of trade.

Hypothesis: War has a negative effect on a state's economy.

The null hypothesis, then, is that war has no effect on a state's economy. This can be rejected if war is found to have a significant negative effect.

RESEARCH DESIGN

Definitions and Datasets

Cost is measured in this thesis in terms of energy consumption aggregated annually, with energy consumption used as a proxy for GNP, as discussed by Lewis-Beck (1986). For testing, I obtained information from the Inter-State War Dataset, developed by Sarkees and Wyman (2010), from the Correlates of War, containing data on wars taking place between or among states from 1816 through 2007, as well as that National Material Capabilities Dataset, originally developed by Singer, Bremer, and Stuckey (1972), providing data on energy consumption, as well as on other variables. I used Version 4 of this dataset. The energy consumption variable in this dataset is labelled "Primary Energy Consumption," and is formulated as

Consumption = Production + Imports – Exports – Δ in Domestic Stocks

Primary Energy Consumption is computed using data on commercial, or industrial, energy (e.g., coal, natural gas, electricity, and petroleum), converted into one thousand metric ton coal equivalents and added together to determine the energy consumption for a particular state and a particular year. For further information on the computation of Primary Energy Consumption, see Singer, Bremer, and Stuckey (1972).

Testing

I use an interrupted time-series model, fashioned after that used by Mousseau and Shi (1999) in their test of whether democracy declined in the time leading up to conflict. The dependent variable in my study is "cost" time-series at the national level. There are two dichotomous independent variables—one to measure a shift in cost before a war (level effect)

and one to measure a shift in cost after a war (shock effect). The level effect is used here to measure the expected decline in cost leading up to a war, and the shock effect is used to measure the expected return to pre-war cost levels. Level is coded 0 for all observations before a war and 1 for all observations after that point. Similarly, Shock is coded 1 for observations between the shift point and the end of war, and 0 for observations both before and after war. There is a chance for measurement error if cost increases to pre-war levels sometime after a war ends (other than immediately), but this error must be assumed to be random.

I also include a third variable to control for the trend of cost across time. That is to say, perhaps cost would have increased or decreased regardless of war, so merely seeing a change in cost after a war would be misleading. A count variable called "time" is used, then, to control for the trend in cost regardless of war by taking into account the fact that cost may shift for other reasons.

A formal expression of the model I estimate is:

$$Y_t = \beta_0 + \beta_1 Level_t + \beta_2 Shock_t + \beta_3 Time, \; t = 1, 2, \ldots \qquad (1)$$

where Y is the cost at time t.

Additional dummy variables—"measdum," "measdum2," and "measdum3"—were used as needed to control for changes in the measurement of cost in the original source material. Between the 1950s and 1970, for example, the coders switched their measurement of energy consumption from B. R. Mitchel's *International Historical Statistics* to the *United Nations Energy Statistics Database* (Singer, Bremer, and Stuckey 1972), and so the year of the change for each case, as well as all subsequent years, were coded as 1, while all years before the switch

were coded as 0. For greater detail, please see Appendix B. Similarly, there were changes in the measurement within either the Mitchel data or the UN data; additional measurement dummies were used to control for these changes, as well. I accounted for "normal" cost by including energy consumption data from up to twenty years before and up to twenty years after each war event. Many cases were eliminated due to a lack of data for a full twenty years; this is discussed in greater detail below.

Case Selection

As I am only analyzing the effects of war on the initiator—I am only studying wars of choice—all non-initiator states involved in a particular war were eliminated from the study. There was discussion of including allies of initiators, but this idea was ultimately rejected, as not all states joined the initiator out of a desire to assist the initiator; France, for example, is coded as an ally of Germany during several years of World War II—the years of occupation.

Because it would be difficult to judge any changes in cost for a state going to war soon after gaining independence, all war events beginning within the first ten years of a state's independence—or the beginning of the data records for any other reason—were omitted. For example, the Arab-Israeli War of 1948 is excluded because it began just two years after Jordan (coded as the initiator) gained independence, and the Franco-Spanish War of 1823 is excluded because it began just seven year after the first year of available data. Similarly, because the data end in 2007, all wars ending after 1997, such as the War for Kosovo in 1999, were eliminated. Cases were also eliminated if the initiator ceased to exist within ten years after the end of the war—World War II was excluded due to the division of Germany after the end of the war.

There were several cases with missing energy consumption data, or with energy consumption recorded as "0" for several consecutive years within the time period to be analyzed; these cases were removed as well. The Chaco War of 1932-1935, for example, was eliminated because there is no energy consumption data for the initiator, Bolivia, until five years before the war, and the Lopez War of 1864-1870 was eliminated because there is no energy consumption data for Paraguay for the four years immediately following the war.

I also excluded a war if the initiator was involved in any other war within the measured pre- or post-war period. That is, any war event occurring within the anterior and posterior periods of a war event of study led to the exclusion of that particular case. The Assam War, for example, is eliminated due to the Second World War, the Korean War, the Off-Shore Islands War, and the Sino-Vietnamese Punitive War each occurring within the time period of study.

Limitations and Key Assumptions

Due to the eliminations made during the case selection process, I was left with a relatively small sample size of 11 cases. These are also generally short wars—only two of the wars analyzed lasted over a year, and neither of these lasted more than seventeen months. There is no overtly apparent problem in selection effects, as states included in the sample are those that went to war, and it can be said with certainty that states involved in a war were ultimately not deterred by potential costs.

Contribution to Literature

As mentioned above, many researchers have assumed that there are costs associated with war, but this proposition has not been very widely tested. The question of whether war is

associated with costs, however, is important to understand, as it is directly relevant to a major theory of international relations. If the costs of war are found to be strong, then the Liberal Theory would appear to be supported. If, on the other hand, the costs of war are found to be weak, then there may be little cost to war and the Liberal Theory would not be supported. This analysis, then, shall answer an important question that has so far been missing from the broader field of research.

DESCRIPTIONS OF WARS

Cenepa Valley War

The border between Ecuador and Peru had been disputed by the two states for most of their post-independence histories, and the two had had several minor military conflicts, though most of these had relatively few casualties. Peru invaded Ecuador in 1941, leading to the 1942 Rio Protocol, which delineated almost the entire border in the plains region. Ecuador, however, refused to accept the border in the mountainous region after learning more about the watershed of the Cenepa Valley.

This war began on January 09, 1995, after Peru learned that Ecuador had been secretly building military bases in the disputed area. Peru captured two of the bases, but was unable to capture the third. A cease-fire was announced in mid-February and fighting ended on February 27, 1995. The Declaration of Itamaraty, a peace treaty, was signed on March 17, 1995. Minor border conflicts occurred through September, and all remaining issues were resolved with the signing of the Brasilia Presidential Act on October 26, 1998, granting Peru's border claims, but also allowing Ecuador to build a war memorial at one of the previous bases, and granting Ecuador navigation rights along the Peruvian-controlled segment of the Amazon River. Ecuador is named as the initiator, and the outcome is considered a compromise. Ecuador suffered 550 battle-related deaths; Peru, 950 (Sarkees and Wayman 2010).

Falkland Islands War

The Falkland Islands had switched between British and Spanish/Argentine control several times in their history before the British finally established permanent control in 1833. By the

1980s, the leader of Argentina, General Leopoldi Galtieri, declared that the islands were rightfully Argentina's, as they were in Argentine waters. He sent Argentine forces to the islands, and they quickly defeated the small British force there on March 25, 1982. British Prime Minister Margaret Thatcher, in return, launched a fleet of over one hundred ships which arrived at South Georgia Island on April 25. Argentine forces on the island surrendered, and on May 02, the British sank an Argentine ship in a naval battle. British troops began landing on the Falklands on May 21, and on June 15, Argentine forces surrendered the capital, Port Stanley. Argentina is coded as the initiator of this war, and the United Kingdom is considered the victor. Argentina suffered 746 battle-related deaths, compared to the United Kingdom's 255 (Sarkees and Wayman 2010).

First Russo-Turkish War

After fighting alongside France and the United Kingdom to help Greece in its war for independence from the Ottoman Empire, Russia, itself, went to war against the Turks on April 26, 1828. Though the Russian military did not have much success around the Danube, they were able to make gains in the Caucasus, and reached the outskirts of Constantinople by the end of the summer. The major European powers, however, were suspicious of a Russian occupation of Constantinople, and pushed the Ottoman Empire to concede defeat before the Russians reached the city. The Treaty of Adrianople was signed on September 14, 1829, granting Russia additional territory along the Black Sea. Russia is considered both the initiator and the victor of this war, and suffered 50,000 battle-related deaths, compared to the Ottoman Empire's 80,000 (Sarkees and Wayman 2010).

Football War

Though Honduras and El Salvador had been allied in two Central American wars in the early twentieth century, tensions began increasing in the middle part of the century as each accused the other of border violations. Many Hondurans also began blaming economic troubles on resident Salvadorans. The national football teams of the two states met in June, 1969 for qualifying matches for the 1970 World Cup. Honduras won the first game, and El Salvador won the second. After the third resulted in a Salvadoran victory, Hondurans began assaulting resident Salvadorans.

El Salvador launched a preemptive attack on July 14, 1969, hoping the surprise would give them an advantage over the superior Honduran air force. The states quickly agreed to a cease-fire which went into effect on July 18, 1969, though small skirmishes occasionally broke out through the end of the month. Though Honduras is considered to have won the air battle, El Salvador is seen as the overall victor due to its occupation of Honduran territory. El Salvador, also seen as the initiator, ceded the occupied territory back to Honduras in return for the latter's agreement to protect resident Salvadorans. Honduras suffered 1,200 battle-related deaths; El Salvador, 700 (Sarkees and Wayman 2010).

Mexican-American War

Texas gained independence from Mexico in the mid-1830s, but the border was still disputed upon the United States' annexation of the former Mexican territory. After Mexico rejected the US's offer to negotiate the border and to purchase California and New Mexico, the United States moved troops into the disputed area. Mexican forces entered the region and attacked US troops on April 25, 1846, and the United States declared war on May 13. Though

the battle plan of the United States originally did not involve pushing too deeply into Mexico, US troops eventually made their way to Mexico City after a series of military victories. Fighting ended with the American capture of Mexico's capital on September 14, 1847. The Treaty of Guadalupe Hidalgo was signed on February 02, 1848, in which Mexico agreed to US border claims for Texas and also sold New Mexico and Alta California to the United States for $15,000,000. The United States is considered both the initiator and the victor, and suffered 13,283 battle-related deaths, compared to Mexico's 6,000 (Sarkees and Wayman 2010).

Second Ogaden War, Phase 2

After gaining independence, Somalia hoped to annex outside territories occupied by ethnic Somalis, and so offered support to the Western Somali Liberation Front (WSLF), which was then fighting against Ethiopia in the Ogaden region. Haile Selassie was overthrown in a military coup in Ethiopia in 1974 and replaced by Major Mengistu Haile Mariam, though he was soon opposed by the socialist-leaning Ethiopian People's Revolutionary Party. In order to provide greater support for the WSLF, Somalia invaded Ethiopia on July 23, 1977, and the Somali military was able to capture more than half of the Ogaden.

Somalia began suffering military defeats, however, after the Soviet Union shifted its support from Somalia to Ethiopia. The Soviet Union airlifted Cuban troops into Ethiopia in November of that year, and the Somali military was forced back across the border. Somalia declared an end to its involvement on March 09, 1978, and the war continued within Ethiopia as an intra-state civil war. Somalia is considered the initiator of the interstate phase of this war; there is no clear victor, though Somali troops did withdraw from Ethiopia. Somalia suffered 8,000 battle-related deaths; Ethiopia, 1,800; and Cuba, 700 (Sarkees and Wayman 2010).

Second Russo-Turkish War

What began as an intra-state civil war, with Bosnia and Bulgaria rising up against the Ottoman Empire, soon evolved into an extra-state war when Serbia, and later Montenegro, joined. Before declaring war, Serbia unsuccessfully sought aid from both Russia and Austria. The two powers eventually signed a secret agreement in which Austria promised neutrality in the event of Russia's involvement in the war, and would be permitted to occupy Bosnia and Herzegovina, while Russia would be allowed to occupy Bulgaria. In April, 1877, Romania granted Russian troops permission to cross into their territory, and on April 24, Russia declared war on the Ottoman Empire. Serbia had been defeated by this point, so Russia picked up much of the fighting itself and had several successes in the Caucasus, but ran into more difficulty in the Balkans. Both Romania and Bulgaria declared their independence in May, and Russian forces launched their first major assault in the Balkans on July 20, but were stopped at Plevna. The Russian military attempted for several months to capture the city, only succeeding with military assistance from Romania in November.

By the beginning of 1878, Russian troops occupied almost all of the European portion of the Ottoman Empire—all but the peninsula of Gallipoli and the areas around Constantinople—and an armistice ended hostilities on January 31, 1878. The Treaty of San Stefano was signed on February 19, 1878. The subsequent Treaty of Berlin of 1878 forced the Ottoman Empire to give up much of its European territory, including land on the eastern coast of the Black Sea that was granted to Russia. The Ottoman Empire was also forced to grant independence to Serbia and Romania, and autonomy to Bulgaria. In all, Russia—considered the both initiator and the victor—suffered 120,000 battle-related deaths, compared to the Ottoman Empire's 165,000 (Sarkees and Wayman 2010).

Turco-Cypriot War

After withdrawing troops from Egypt, Britain viewed Cyprus, which it had gained from the Ottoman Empire in 1878, as an important colony in the region. Frequent conflicts between Greek residents and Turkish residents, however, plagued the island. Cyprus gained its independence with the signing of the London-Zurich agreements between the United Kingdom, Greece, and Turkey in 1959. The signatories agreed that Cyprus would not be partitioned, but that their respective countries would be allowed to maintain military bases on the island. The united government, however, devolved into two separate governments—one representing Cypriot Turks and one representing Cypriot Greeks—by 1964, and in 1974, Greek Cypriot president Archbishop Makarios requested that Greece and Turkey each remove their troops from the island. Greek forces subsequently overthrew him in a coup on July 15, 1974 and Turkey, fearing that the island would be handed over to Greece, sent 8,000 troops to aid the 750 Turkish units already there. Turkey soon sent more, bringing their troop total on the island to 40,000, compared to the 13,000 Greek troops.

Turkey was able to turn back Greek reinforcements, and on July 18 demanded the withdrawal of all Greek forces on the island. After Greece refused, Turkey began a ground invasion and air attacks on July 20, 1974. Fighting stopped temporarily after the two sides agreed to a United Nations-backed ceasefire on July 30, but hostilities resumed after the failure of a second round of negotiations that had lasted from August 8-14. A second cease-fire was agreed to on August 16, 1974, at which point there existed a de facto partitioning of the island, with the Turks controlling roughly 40% of the island for the roughly 20% of the island's population comprised of Turkic Cypriots. UN troops were stationed along the dividing "Attila Line" and Makarios was returned to power in December 1974. Turkey, which suffered 1,000

battle-related deaths, is considered both the initiator and the victor; Cyprus suffered 500 battle-related deaths (Sarkees and Wayman 2010).

Ugandan-Tanzanian War

Relations became strained between Uganda and Tanzania after Tanzanian President Julius Nyerere publicly denounced Ugandan dictator Idi Amin, and after members of the army of former Ugandan president Milton Obote unsuccessfully invaded from Tanzania in an attempt to restore Obote in 1972. Ugandan troops invaded Tanzania on October 28, 1978 and pushed inwards twenty miles, at which point Amin announced his intention of annexing the newly occupied territory. Tanzania counterattacked on November 11, reaching the Ugandan border by November 14 and pushing into Uganda in January 1979 with the encouragement of other states in the region. The Ugandan army all but disappeared, leaving 2,700 Libyan troops to defend Amin. Most of the Libyan units were removed from Uganda after an unsuccessful battle in April, and the combined Tanzanian forces and Uganda National Liberation Army were able to capture Kampala on April 11, 1979. Amin fled the country, and Obote returned to power after elections at the end of 1980. The results of these elections were contested, however, leading to two intra-state wars in the 1980s. Uganda is considered the initiator of the Ugandan-Tanzanian War and suffered 1,500 battle-related deaths. Tanzania, considered the victor, suffered 1,000 battle-related deaths. Libya suffered 500 battle-related deaths (Sarkees and Wayman 2010).

War over Angola

This war is rooted in Angola's independence movement, and stemmed from its thirteen-year war for independence. There existed several separate rebel groups which had agreed to

form a coalition government until independence was officially granted on November 11, 1975, at which point elections were to be held to establish an independent government. Fighting broke out between the rebel groups, however, before Angola was officially granted its independence, and the various rebel groups soon gained support from outside actors, transforming the conflict into an inter-state war on October 23, 1975. South Africa, supporting both the National Union for the Total Independence of Angola (UNITA) and the National Front for the Liberation of Angola (FNLA), invaded Angola and occupied territory in the south. Several thousand Cuban troops, along with Soviet advisers, assisted the Popular Movement for the Liberation of Angola (MPLA) in fighting the South African military. As South Africa and UNITA advanced through the south, the FNLA, aided by Zairian troops, advanced from the north.

Angola officially entered the war as a member of the interstate system upon independence in November. The MPLA, based in Luanda, and the alliance of the FNLA and UNITA, based in Huambo, each declared their own governments—the former declaring the People's Republic of Angola and the latter declaring the Social Democratic Republic of Angola, though only the former was recognized as the state's government. MPLA forces soon received additional Cuban troops and Soviet arms, giving them a greater advantage over the other groups. The MPLA was able to make further gains in both the north and the south, and was able to beat back a UNITA-led offensive through that summer. Most of the South African troops were forced back across the Angolan border by February 12, 1976, marking what is considered the end of the inter-state war and the transition to the intra-state Angolan Control War. South Africa is considered the initiator of this war, and suffered 100 battle-related deaths. Zaire, too, suffered

100 battle-related deaths. Cuba suffered 1,500, and Angola suffered 1,000 battle-related deaths (Sarkees and Wayman 2010).

War over the Aouzou Strip

This war developed from some of the political and regional developments of a civil war fought in Chad in 1980. The civil war was a conflict between the Popular Armed Forces (FAP), loyal to Chadian President Goukouni Oueddei, and the Armed Forces of the North (FAN), loyal to the state's minister of defense, Hissene Habre. Libya supported the FAP troops, and, after military success, declared Chad and Libya to be united. After Libyan forces left Chad, FAN troops returned to the country with the support of France. Habre was able to remain in office and France and Libya agreed to remove their armies, though Libya then continued to occupy the Aouzou Strip. This inter-state war officially began on November 15, 1986, after Habre's forces shot down a Libyan plane. Over the next several months, Habre's forces, with the help of France, were able to push Libya out of the Aouzou Strip. The war ended on September 11, 1987, with agreement to a cease-fire sponsored by the Organization of African Unity. The status of the Aouzou Strip, however, was not resolved until the International Court of Justice ruled in Chad's favor, and the land was formally returned by Libya in 1994 (Sarkees and Wayman 2010).

RESULTS

The idea in this thesis is to test whether war has an overall negative effect on a state's economy. As Level and Shock each only provide a partial picture of the effects of war on a state's economy, it is necessary to combine the two variables—that is, to add them together—to gain a better understanding of the full effects of war on a state's economy. For those cases that have a negative overall coefficient after Level and Shock are combined, it can be inferred that the war came with costs, having had a negative effect on the state's economy. For those cases with a positive overall coefficient, the war would appear to have paid, in that it had a positive effect on the state's economy.

When controlling for time and the various changes in the measurement of the energy consumption variable, and when including a lag variable, five of the eleven cases tested had a negative overall coefficient, while seven had a positive overall coefficient. This early look would appear to give a mixed result as to whether war comes with costs, as held by the Liberal Theory.

Level and Shock, however, only reach significance in three of the eleven cases: the Football War, the Second Ogaden War, Phase 2, and the War Over Angola. Interestingly, in each of these three cases, Shock has a negative effect, indicating an immediate negative effect of war, and Level has a positive effect, indicating a positive growth over time. When adding Shock and Level together, though, only the Football War has a negative overall effect on the initiator's energy consumption, as was hypothesized. The other two cases—the Second Ogaden War, Phase 2, and the War Over Angola—each had positive overall effects on the economies of the respective initiators. These latter two cases, however, may each be affected by positive first-

order serial correlation: when determining the Durbin-Watson statistic, the result fell within the inconclusive range of the presence or absence of such.

Table 1: Effects of War on a State's Economy

			Coefficients								
War	Initiator	D. Freedom	Time		Lag		Level		Shock		Level + Shock
Turco-Cypriot War 1974	Turkey	33	638.84		0.67	***	-4493.23		3128.08		-1365.15
Falkland Islands War 1982	Argentina	33	792.30	**	0.60	***	-1377.90		500.54		-877.36
Ugandan-Tanzanian War 1978-1979	Uganda	30	73.35	***	0.10	***	-200.91		54.23		-146.68
War Over the Aouzou Strip 1986-1987	Chad	33	12.09	***	0.18	***	-77.39		11.06		-66.33
Football War 1969	El Salvador	35	15.24	**	0.51	***	1127.48	***	-1168.39	***	-40.91
First Russo-Turkish War 1828-1829	Russia	28	1.32	*	0.75	***	-11.35		3.83		-7.52
Second Ogaden War, Phase 2 1977-1978	Somalia	31	53.21	***	0.05		298.17	**	-290.14	**	8.03
Mexican-American War 1846-1847	United States of America	36	36.30		0.99	***	203.98		-28.87		175.11
Second Russo-Turkish War 1877-1878	Russia	34	154.45	***	0.36	***	489.21		-183.70		305.51
Cenepa Valley War 1995	Ecuador	27	237.82	*	0.34		329.26		1441.34		1770.60
War Over Angola 1975-1976	South Africa	34	877.84	*	0.45	***	17450.93	**	-12153.13	*	5297.80
* indicates statistical significance at the .05 level											
** indicates statistical significance at the .01 level											
*** indicates statistical significance at the .001 level											

Based on these results, it does not appear that one can be certain that war is associated with costs. In only one of the eleven cases tested did war have the expected negative and significant overall effect on a state's economy. And though two of the cases are positive and significant, they may—or may not—suffer from autocorrelation. But with only one case showing the expected result of a negative effect, these results appear to weaken the Liberal Theory, which maintains that war interrupts trade, which in turn negatively affects a state's economy.

Perhaps substitution and elasticity, then, are enough to keep a state's economy from going into decline during wartime. That is, perhaps the states analyzed in this study were able to compensate for potential lost trade with the wartime enemy by trading with other states or for other products. It should be noted, though, that none of the wars analyzed lasted a particularly long time. The longest period of conflict in this study is that of the Mexican-American War, which lasted just under seventeen months. This is closely followed by the First Russo-Turkish War, which lasted one day less. Of the other wars, none lasted more than ten months. The shortest was the Football War, which lasted only four days.

The implication here is that the results may vary for prolonged wars—wars lasting more than a year. The two used in this analysis that last over a year are from the early- to mid-nineteenth century; perhaps results would be different in later decades, especially with the great increases in interdependence in the late-nineteenth century and throughout the twentieth century. If the time period of the war does play a factor, however, it can certainly not be acting alone. While the three cases that achieved significant results all occurred in a time period ranging from

1969-1978, there were other cases tested that occurred within or very close to this same time period but did not achieve significance.

Interdependence should also play a greater role in future studies. As the goal of this analysis was to determine whether war has costs for the initiator, a variable measuring trade may be helpful for further testing (and a better understanding) of the relation between war and trade, and whether, as the Liberal Peace Theory maintains, trade reduces the likelihood of conflict. Of course, with substitution and elasticity in mind, trade may not be as important a factor as previously believed when attempting to determine the effects of war on a state's economy; however, trade was not accounted for in this analysis, and it is not known whether the states involved in the wars studied were heavily interdependent before war began.

CONCLUSION

Though there has been a divide in the literature between Realist Theory and Liberal Theory, much of the empirical work tends to support the latter. This body of work generally finds support for the claim that interdependence decreases the likelihood of conflict. Part of this theory, though, is the simple acceptance of the idea that war comes with costs. The idea behind this is that two trading states lose out on their trade when they go to war with each other, and that this loss of trade, in turn, negatively affects the economy, as each state is no longer obtaining necessary or desired resources. When assuming national decision makers are rational actors, pursuing the economic prosperity of their respective states, it follows that these decision makers would want to avoid war; that is, unless there is a compelling reason, they would not want to pursue anything that might harm the economy.

Due to the principles of substitution and elasticity, however, there may not necessarily be a decline in overall trade for a state when a war starts. If State *i* is receiving bananas from State *j*, but then the two states declare war on one another, State *i* can obtain bananas from another state, at least until the war ends. Or, in terms of elasticity, State *i* can forgo bananas entirely, since bananas are not a necessity of life.

Looking only at trade during conflict, then, may not provide a full picture of what is happening to a state's economy. That is why this thesis analyzed energy consumption as a proxy for GDP. Looking more directly at a state's economy ought to provide a fuller picture and better understanding of whether, as the Liberal Theory maintains, war has a negative effect on a state's economy. Because much of the literature on the topic of trade and war tends to support the Liberal Theory, the hypothesis of this analysis was that war would have a negative effect on a

state's economy. That is, the expected finding would be a decline in energy consumption within a state as a result of a war.

The Inter-State War Dataset from the Correlates of War was used to obtain a list of wars and their initiators. The idea behind analyzing only initiators is that, regardless of any other facts, these states were not deterred by any potential costs of war—the leaders of these states felt that war was a necessity, or at least that there were no better alternatives, in order to obtain a desired goal. A time series analysis model was used, with up to twenty years before and up to twenty years after each war event analyzed in the study. Wars were eliminated if any other wars occurred in this pre- or post-war period. Due to missing data and other factors, the sample size was eventually reduced to eleven.

Variables used in the analysis include Level and Shock, Time, Lag, and dummy variables to control for changes in the measurement of energy consumption within the National Material Capabilities dataset obtained from the Correlates of War. Of the eleven cases analyzed, three reached significance, and of these, one was in the expected negative direction. Of the eleven wars studied, then, there only appeared to be a statistically significant negative effect in one case—the Football War, initiated by El Salvador against Honduras in 1969. The other two wars that reached significance—the Second Ogaden War, Phase 2, and the War Over Angola—appear to have had positive effects on the respective initiators' economies. Each of these cases, however, contained evidence of autocorrelation.

It does not seem as though it can be concluded, then, that war necessarily comes with costs. Only one war analyzed in this study had a statistically significant negative effect on the initiator's economy. Based on this analysis, it seems more likely that war often has no definitive

effect on a state's economy. This result weakens the Liberal Theory, which maintains that war necessarily has a negative effect on a state's economy. Due to substitution and elasticity, it seems that a state is able to maintain a relatively stable economy in spite of war, as there is a statistically significant negative result in only one of the eleven cases in this study.

Future researchers should almost certainly delve deeper into this topic, as the belief that war necessarily comes with costs is an important component of a major theory of international relations. This belief, though, based on the results of this study, may not be entirely accurate. Though many scholars have found that interdependence lessens the likelihood of conflict, it may not be correct to assume that this is due solely to leaders not wanting to disturb their respective states' economies. There may very well be any number of other factors that lower the likelihood of conflict among interdependent states. If a leader's economic worries are in fact what keeps these states from going to war with each other, this worry is not supported by the findings of this analysis.

It may also be helpful for future researchers to analyze the effects of war on non-initiators. Though the idea of this analysis was to study "wars of choice," it would be interesting and beneficial to the field to determine whether states that do not initiate a war tend to experience different consequences than those that do initiate. Similarly, initiators may have information leading up to war that leads them to believe that they will be victorious, while non-initiators might have avoided initiating a war out of a fear of defeat. This then, leads to a potential selection bias in this paper, but one that could easily be addressed in future works.

Resources may be an important factor to evaluate in future research, as well. The discovery during wartime of new resources or of new sources of resources may help a warring

state in its fight against its opponent. This project did not consider resources, based on the idea that they contribute to the overall economy. A new discover though, may lead to a change that ought to be accounted for.

APPENDIX A
LIST OF CASES ANALYZED
INCLUDING INITIATOR
DATE AND LENGTH OF WAR
AND TIMESPAN OF DATA

Cenepa Valley War
Dates of War: January 09, 1995-February 27, 1995
Length of War: Seven weeks
Initiator: Ecuador
Data span: 1975-2007

Falkland Islands War
Dates of War: March 25, 1982-June 15, 1982
Length of War: Two months, three weeks
Initiator: Argentina
Data span: 1962-2002

First Russo-Turkish War
Dates of War: April 26, 1828-September 14, 1829
Length of War: One year, two months, four weeks, five days
Initiator: Russia
Data span: 1816-1849

Football War
Dates of War: July 14, 1969-July 18, 1969
Length of War: Four days
Initiator: El Salvador
Data span: 1950-1989

Mexican-American War
Dates of War: April 25, 1846-September 14, 1847
Length of War: One year, four month, two weeks, six days
Initiator: United States of America
Data span: 1826-1867

Second Ogaden War, Phase 2
Dates of War: July 23, 1977-March 09, 1978
Length of War: Seven months, two weeks
Initiator: Somalia
Data span: 1960-1998

Second Russo-Turkish War
Dates of War: April 24, 1877-January 31, 1878
Length of War: Nine months, one week
Initiator: Russia
Data span: 1857-1898

Turco-Cypriot War
Dates of War: July 20, 1974-July 29, 1974
Length of War: Nine days
Initiator: Turkey
Data span: 1954-1994

Ugandan-Tanzanian War
Dates of War: October 28, 1978-April 11, 1979
Length of War: Five months, two weeks
Initiator: Uganda
Data span: 1962-1999

War Over Angola
Dates of War: October 23, 1975-February 12, 1976
Length of War: Three months, two weeks, six days
Initiator: South Africa
Data span: 1955-1996

War Over the Aouzou Strip
Dates of War: November 15, 1986-September 11, 1987
Length of War: Nine months, three weeks, six days
Initiator: Chad
Data span: 1966-2007

APPENDIX B
DATA TABLES

Table 2: Cenepa Valley War

stateabb	ccode	year	pec	level	shock	time	pec_L1
ECU	130	1975	5364.084	0	0	1	.
ECU	130	1976	5492.045	0	0	2	5364.084
ECU	130	1977	5384.253	0	0	3	5492.045
ECU	130	1978	8640.312	0	0	4	5384.253
ECU	130	1979	9607.498	0	0	5	8640.312
ECU	130	1980	9962.08	0	0	6	9607.498
ECU	130	1981	10842.24	0	0	7	9962.08
ECU	130	1982	11952.74	0	0	8	10842.24
ECU	130	1983	11641.91	0	0	9	11952.74
ECU	130	1984	13155.39	0	0	10	11641.91
ECU	130	1985	12079.69	0	0	11	13155.39
ECU	130	1986	10904.61	0	0	12	12079.69
ECU	130	1987	9833.174	0	0	13	10904.61
ECU	130	1988	12674.64	0	0	14	9833.174
ECU	130	1989	13825.55	0	0	15	12674.64
ECU	130	1990	12450.75	0	0	16	13825.55
ECU	130	1991	12428.07	0	0	17	12450.75
ECU	130	1992	14754.06	0	0	18	12428.07
ECU	130	1993	16884.55	0	0	19	14754.06
ECU	130	1994	12141.96	0	0	20	16884.55
ECU	130	1995	15848.81	1	1	21	12141.96
ECU	130	1996	17136.3	1	0	22	15848.81
ECU	130	1997	15211.53	1	0	23	17136.3
ECU	130	1998	16225.27	1	0	24	15211.53
ECU	130	1999	16832.59	1	0	25	16225.27
ECU	130	2000	17920.41	1	0	26	16832.59
ECU	130	2001	17619.99	1	0	27	17920.41
ECU	130	2002	17730.37	1	0	28	17619.99
ECU	130	2003	17776.76	1	0	29	17730.37
ECU	130	2004	19016.46	1	0	30	17776.76
ECU	130	2005	18296.07	1	0	31	19016.46
ECU	130	2006	19067.9	1	0	32	18296.07
ECU	130	2007	19705.87	1	0	33	19067.9

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.”

Table 3: Falkland Islands War

stateabb	ccode	year	pec	level	shock	time	measdum	measdum2	pec_L1
ARG	160	1962	25766	0	0	1	0	0	.
ARG	160	1963	25926	0	0	2	0	0	25766
ARG	160	1964	27539	0	0	3	0	0	25926
ARG	160	1965	30656	0	0	4	0	0	27539
ARG	160	1966	34349	0	0	5	0	0	30656
ARG	160	1967	34837	0	0	6	0	0	34349
ARG	160	1968	37762	0	0	7	0	0	34837
ARG	160	1969	39359	0	0	8	0	0	37762
ARG	160	1970	46367.18	0	0	9	1	0	39359
ARG	160	1971	49895.31	0	0	10	1	0	46367.18
ARG	160	1972	52019.18	0	0	11	1	0	49895.31
ARG	160	1973	53948.95	0	0	12	1	0	52019.18
ARG	160	1974	55302.43	0	0	13	1	0	53948.95
ARG	160	1975	55183.5	0	0	14	1	0	55302.43
ARG	160	1976	58684.85	0	0	15	1	0	55183.5
ARG	160	1977	61449.12	0	0	16	1	0	58684.85
ARG	160	1978	61972.02	0	0	17	1	0	61449.12
ARG	160	1979	65424.25	0	0	18	1	0	61972.02
ARG	160	1980	69521.81	0	0	19	1	0	65424.25
ARG	160	1981	68877.6	0	0	20	1	0	69521.81
ARG	160	1982	70309.05	1	1	21	1	0	68877.6
ARG	160	1983	71453.76	1	0	22	1	0	70309.05
ARG	160	1984	78634.93	1	0	23	1	1	71453.76
ARG	160	1985	78635.73	1	0	24	1	1	78634.93
ARG	160	1986	77236.48	1	0	25	1	1	78635.73
ARG	160	1987	82843.07	1	0	26	1	1	77236.48
ARG	160	1988	87315.22	1	0	27	1	1	82843.07
ARG	160	1989	89974.13	1	0	28	1	1	87315.22
ARG	160	1990	90541.58	1	0	29	1	1	89974.13
ARG	160	1991	93022.66	1	0	30	1	1	90541.58
ARG	160	1992	90711.57	1	0	31	1	1	93022.66
ARG	160	1993	86533.07	1	0	32	1	1	90711.57
ARG	160	1994	89110.45	1	0	33	1	1	86533.07
ARG	160	1995	88240.67	1	0	34	1	1	89110.45
ARG	160	1996	93318.53	1	0	35	1	1	88240.67
ARG	160	1997	100024.3	1	0	36	1	1	93318.53
ARG	160	1998	100607.4	1	0	37	1	1	100024.3
ARG	160	1999	107651.4	1	0	38	1	1	100607.4
ARG	160	2000	107570.9	1	0	39	1	1	107651.4
ARG	160	2001	117034.3	1	0	40	1	1	107570.9
ARG	160	2002	115654.3	1	0	41	1	1	117034.3

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.” “Measdum” and “measdum2” control for changes in the source material in the measurement of energy consumption.

Table 4: First Russo-Turkish War

stateabb	ccode	year	pec	level	shock	time	pec_L1
RUS	365	1816	15	0	0	1	.
RUS	365	1817	15	0	0	2	15
RUS	365	1818	14	0	0	3	15
RUS	365	1819	14	0	0	4	14
RUS	365	1820	14	0	0	5	14
RUS	365	1821	14	0	0	6	14
RUS	365	1822	14	0	0	7	14
RUS	365	1823	14	0	0	8	14
RUS	365	1824	27	0	0	9	14
RUS	365	1825	27	0	0	10	27
RUS	365	1826	27	0	0	11	27
RUS	365	1827	26	0	0	12	27
RUS	365	1828	26	1	1	13	26
RUS	365	1829	26	1	1	14	26
RUS	365	1830	26	1	0	15	26
RUS	365	1831	25	1	0	16	26
RUS	365	1832	25	1	0	17	25
RUS	365	1833	25	1	0	18	25
RUS	365	1834	25	1	0	19	25
RUS	365	1835	37	1	0	20	25
RUS	365	1836	37	1	0	21	37
RUS	365	1837	37	1	0	22	37
RUS	365	1838	37	1	0	23	37
RUS	365	1839	49	1	0	24	37
RUS	365	1840	61	1	0	25	49
RUS	365	1841	61	1	0	26	61
RUS	365	1842	67	1	0	27	61
RUS	365	1843	59	1	0	28	67
RUS	365	1844	71	1	0	29	59
RUS	365	1845	83	1	0	30	71
RUS	365	1846	99	1	0	31	83
RUS	365	1847	94	1	0	32	99
RUS	365	1848	107	1	0	33	94
RUS	365	1849	107	1	0	34	107

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.”

Table 5: Football War

stateabb	ccode	year	pec	level	shock	time	measdum	pec_L1
SAL	92	1949	.	0	0	1	0	.
SAL	92	1950	8	0	0	2	0	0
SAL	92	1951	9	0	0	3	0	8
SAL	92	1952	11	0	0	4	0	9
SAL	92	1953	15	0	0	5	0	11
SAL	92	1954	16	0	0	6	0	15
SAL	92	1955	18	0	0	7	0	16
SAL	92	1956	20	0	0	8	0	18
SAL	92	1957	23	0	0	9	0	20
SAL	92	1958	26	0	0	10	0	23
SAL	92	1959	29	0	0	11	0	26
SAL	92	1960	31	0	0	12	0	29
SAL	92	1961	34	0	0	13	0	31
SAL	92	1962	37	0	0	14	0	34
SAL	92	1963	42	0	0	15	0	37
SAL	92	1964	47	0	0	16	0	42
SAL	92	1965	51	0	0	17	0	47
SAL	92	1966	59	0	0	18	0	51
SAL	92	1967	64	0	0	19	0	59
SAL	92	1968	827	0	0	20	0	64
SAL	92	1969	592	1	1	21	0	827
SAL	92	1970	1750.667	1	0	22	1	592
SAL	92	1971	2234.43	1	0	23	1	1750.667
SAL	92	1972	2321.98	1	0	24	1	2234.43
SAL	92	1973	2592.564	1	0	25	1	2321.98
SAL	92	1974	2680.553	1	0	26	1	2592.564
SAL	92	1975	2738.983	1	0	27	1	2680.553
SAL	92	1976	2913.032	1	0	28	1	2738.983
SAL	92	1977	3077.729	1	0	29	1	2913.032
SAL	92	1978	3179.056	1	0	30	1	3077.729
SAL	92	1979	3214.716	1	0	31	1	3179.056
SAL	92	1980	3116.215	1	0	32	1	3214.716
SAL	92	1981	2941.071	1	0	33	1	3116.215
SAL	92	1982	2936.23	1	0	34	1	2941.071
SAL	92	1983	3080.931	1	0	35	1	2936.23
SAL	92	1984	3103.419	1	0	36	1	3080.931
SAL	92	1985	3255.685	1	0	37	1	3103.419
SAL	92	1986	3290.122	1	0	38	1	3255.685
SAL	92	1987	3361.299	1	0	39	1	3290.122
SAL	92	1988	3292.533	1	0	40	1	3361.299
SAL	92	1989	3347.112	1	0	41	1	3292.533

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.” “Measdum” controls for changes in the source material in the measurement of energy consumption.

Table 6: Mexican-American War

stateabb	ccode	year	pec	level	shock	time	pec_L1
USA	2	1826	502	0	0	1	.
USA	2	1827	556	0	0	2	502
USA	2	1828	609	0	0	3	556
USA	2	1829	686	0	0	4	609
USA	2	1830	799	0	0	5	686
USA	2	1831	864	0	0	6	799
USA	2	1832	1154	0	0	7	864
USA	2	1833	1348	0	0	8	1154
USA	2	1834	1291	0	0	9	1348
USA	2	1835	1650	0	0	10	1291
USA	2	1836	1807	0	0	11	1650
USA	2	1837	2027	0	0	12	1807
USA	2	1838	1922	0	0	13	2027
USA	2	1839	2159	0	0	14	1922
USA	2	1840	2244	0	0	15	2159
USA	2	1841	2374	0	0	16	2244
USA	2	1842	2643	0	0	17	2374
USA	2	1843	2967	0	0	18	2643
USA	2	1844	3557	0	0	19	2967
USA	2	1845	4284	0	0	20	3557
USA	2	1846	4863	1	1	21	4284
USA	2	1847	5767	1	1	22	4863
USA	2	1848	6424	1	0	23	5767
USA	2	1849	6976	1	0	24	6424
USA	2	1850	7607	1	0	25	6976
USA	2	1851	9438	1	0	26	7607
USA	2	1852	10270	1	0	27	9438
USA	2	1853	11570	1	0	28	10270
USA	2	1854	13632	1	0	29	11570
USA	2	1855	14651	1	0	30	13632
USA	2	1856	15378	1	0	31	14651
USA	2	1857	15779	1	0	32	15378
USA	2	1858	16015	1	0	33	15779
USA	2	1859	17435	1	0	34	16015
USA	2	1860	18282	1	0	35	17435
USA	2	1861	17660	1	0	36	18282
USA	2	1862	18366	1	0	37	17660
USA	2	1863	21157	1	0	38	18366
USA	2	1864	22597	1	0	39	21157
USA	2	1865	22658	1	0	40	22597
USA	2	1866	26846	1	0	41	22658
USA	2	1867	28027	1	0	42	26846

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.”

Table 7: Second Ogaden War, Phase 2

stateabb	ccode	year	pec	level	shock	time	measdum	measdum2	pec_L1
SOM	520	1960	1	0	0	1	0	0	.
SOM	520	1961	1	0	0	2	0	0	1
SOM	520	1962	1	0	0	3	0	0	1
SOM	520	1963	1	0	0	4	0	0	1
SOM	520	1964	1	0	0	5	0	0	1
SOM	520	1965	2	0	0	6	0	0	1
SOM	520	1966	2	0	0	7	0	0	2
SOM	520	1967	2	0	0	8	0	0	2
SOM	520	1968	31	0	0	9	0	0	2
SOM	520	1969	44	0	0	10	0	0	31
SOM	520	1970	1315.293	0	0	11	1	0	44
SOM	520	1971	1345.654	0	0	12	1	0	1315.293
SOM	520	1972	1369.595	0	0	13	1	0	1345.654
SOM	520	1973	1411.201	0	0	14	1	0	1369.595
SOM	520	1974	1436.163	0	0	15	1	0	1411.201
SOM	520	1975	1493.515	0	0	16	1	0	1436.163
SOM	520	1976	1546.424	0	0	17	1	0	1493.515
SOM	520	1977	1593.809	1	1	18	1	0	1546.424
SOM	520	1978	1772.019	1	1	19	1	0	1593.809
SOM	520	1979	1883.248	1	0	20	1	0	1772.019
SOM	520	1980	2199.945	1	0	21	1	0	1883.248
SOM	520	1981	1960.557	1	0	22	1	0	2199.945
SOM	520	1982	2246.566	1	0	23	1	0	1960.557
SOM	520	1983	2394.667	1	0	24	1	0	2246.566
SOM	520	1984	2343.394	1	0	25	1	0	2394.667
SOM	520	1985	2476.518	1	0	26	1	0	2343.394
SOM	520	1986	2532.677	1	0	27	1	0	2476.518
SOM	520	1987	2590.334	1	0	28	1	0	2532.677
SOM	520	1988	2624.251	1	0	29	1	0	2590.334
SOM	520	1989	2647.707	1	0	30	1	0	2624.251
SOM	520	1990	2014.773	1	0	31	1	1	2647.707
SOM	520	1991	2079.592	1	0	32	1	1	2014.773
SOM	520	1992	2220.972	1	0	33	1	1	2079.592
SOM	520	1993	2264.974	1	0	34	1	1	2220.972
SOM	520	1994	2321.597	1	0	35	1	1	2264.974
SOM	520	1995	2400.495	1	0	36	1	1	2321.597
SOM	520	1996	2500.24	1	0	37	1	1	2400.495
SOM	520	1997	2619.932	1	0	38	1	1	2500.24
SOM	520	1998	2710.183	1	0	39	1	1	2619.932

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.” “Measdum” and “measdum2” control for changes in the source material in the measurement of energy consumption.

Table 8: Second Russo-Turkish War

stateabb	ccode	year	pec	level	shock	time	measdum	measdum2	pec_L1
RUS	365	1857	213	0	0	1	0	0	.
RUS	365	1858	229	0	0	2	0	0	213
RUS	365	1859	250	0	0	3	0	0	229
RUS	365	1860	300	0	0	4	0	0	250
RUS	365	1861	400	0	0	5	0	0	300
RUS	365	1862	300	0	0	6	0	0	400
RUS	365	1863	400	0	0	7	0	0	300
RUS	365	1864	400	0	0	8	0	0	400
RUS	365	1865	400	0	0	9	0	0	400
RUS	365	1866	1050	0	0	10	1	0	400
RUS	365	1867	1203	0	0	11	1	0	1050
RUS	365	1868	977	0	0	12	1	0	1203
RUS	365	1869	1403	0	0	13	1	0	977
RUS	365	1870	1545	0	0	14	1	0	1403
RUS	365	1871	2038	0	0	15	1	0	1545
RUS	365	1872	2162	0	0	16	1	0	2038
RUS	365	1873	2033	0	0	17	1	0	2162
RUS	365	1874	2337	0	0	18	1	0	2033
RUS	365	1875	2741	0	0	19	1	0	2337
RUS	365	1876	3298	0	0	20	1	0	2741
RUS	365	1877	3281	1	1	21	1	0	3298
RUS	365	1878	4321	1	1	22	1	0	3281
RUS	365	1879	4386	1	0	23	1	0	4321
RUS	365	1880	5222	1	0	24	1	0	4386
RUS	365	1881	5291	1	0	25	1	0	5222
RUS	365	1882	5530	1	0	26	1	0	5291
RUS	365	1883	6183	1	0	27	1	0	5530
RUS	365	1884	5691	1	0	28	1	0	6183
RUS	365	1885	5870	1	0	29	1	0	5691
RUS	365	1886	6115	1	0	30	1	0	5870
RUS	365	1887	5631	1	0	31	1	0	6115
RUS	365	1888	6123	1	0	32	1	0	5631
RUS	365	1889	7232	1	0	33	1	0	6123
RUS	365	1890	6622	1	0	34	1	0	7232
RUS	365	1891	6678	1	0	35	1	0	6622
RUS	365	1892	7227	1	0	36	1	0	6678
RUS	365	1893	8196	1	0	37	1	0	7227
RUS	365	1894	9807	1	0	38	1	0	8196
RUS	365	1895	19693	1	0	39	1	1	9807
RUS	365	1896	20385	1	0	40	1	1	19693
RUS	365	1897	23095	1	0	41	1	1	20385
RUS	365	1898	25991	1	0	42	1	1	23095

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.” “Measdum” and “measdum2” control for changes in the source material in the measurement of energy consumption.

Table 9: Turco-Cypriot War

stateabb	ccode	year	pec	level	shock	time	measdum	measdum2	pec_L1
TUR	640	1954	3867	0	0	1	0	0	.
TUR	640	1955	3896	0	0	2	0	0	3867
TUR	640	1956	4325	0	0	3	0	0	3896
TUR	640	1957	4681	0	0	4	0	0	4325
TUR	640	1958	4842	0	0	5	0	0	4681
TUR	640	1959	4675	0	0	6	0	0	4842
TUR	640	1960	4708	0	0	7	0	0	4675
TUR	640	1961	5016	0	0	8	0	0	4708
TUR	640	1962	8442	0	0	9	0	0	5016
TUR	640	1963	9915	0	0	10	0	0	8442
TUR	640	1964	11571	0	0	11	0	0	9915
TUR	640	1965	11663	0	0	12	0	0	11571
TUR	640	1966	13070	0	0	13	0	0	11663
TUR	640	1967	13626	0	0	14	0	0	13070
TUR	640	1968	14787	0	0	15	0	0	13626
TUR	640	1969	15111	0	0	16	0	0	14787
TUR	640	1970	26727.19	0	0	17	1	0	15111
TUR	640	1971	28982.4	0	0	18	1	0	26727.19
TUR	640	1972	34205.38	0	0	19	1	0	28982.4
TUR	640	1973	35353.68	0	0	20	1	0	34205.38
TUR	640	1974	37624.51	1	1	21	1	0	35353.68
TUR	640	1975	39013.16	1	0	22	1	0	37624.51
TUR	640	1976	42515.45	1	0	23	1	0	39013.16
TUR	640	1977	36888.19	1	0	24	1	0	42515.45
TUR	640	1978	35517.45	1	0	25	1	0	36888.19
TUR	640	1979	35928.55	1	0	26	1	0	35517.45
TUR	640	1980	38387.97	1	0	27	1	0	35928.55
TUR	640	1981	40379	1	0	28	1	0	38387.97
TUR	640	1982	46511.8	1	0	29	1	0	40379
TUR	640	1983	47169.81	1	0	30	1	0	46511.8
TUR	640	1984	95689.73	1	0	31	1	1	47169.81
TUR	640	1985	99105	1	0	32	1	1	95689.73
TUR	640	1986	108925	1	0	33	1	1	99105
TUR	640	1987	123420.3	1	0	34	1	1	108925
TUR	640	1988	139162.2	1	0	35	1	1	123420.3
TUR	640	1989	138983.4	1	0	36	1	1	139162.2
TUR	640	1990	158075.2	1	0	37	1	1	138983.4
TUR	640	1991	153181	1	0	38	1	1	158075.2
TUR	640	1992	160563.8	1	0	39	1	1	153181
TUR	640	1993	176736.5	1	0	40	1	1	160563.8
TUR	640	1994	177623.7	1	0	41	1	1	176736.5

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.” “Measdum” and “measdum2” control for changes in the source material in the measurement of energy consumption.

Table 10: Ugandan-Tanzanian War

stateabb	ccode	year	pec	level	shock	time	measdum	measdum2	pec_L1
UGA	500	1962	56	0	0	1	0	0	.
UGA	500	1963	61	0	0	2	0	0	56
UGA	500	1964	64	0	0	3	0	0	61
UGA	500	1965	73	0	0	4	0	0	64
UGA	500	1966	83	0	0	5	0	0	73
UGA	500	1967	92	0	0	6	0	0	83
UGA	500	1968	101	0	0	7	0	0	92
UGA	500	1969	103	0	0	8	0	0	101
UGA	500	1970	2289.856	0	0	9	1	0	103
UGA	500	1971	2361.802	0	0	10	1	0	2289.856
UGA	500	1972	2393.908	0	0	11	1	0	2361.802
UGA	500	1973	2391.841	0	0	12	1	0	2393.908
UGA	500	1974	2419.035	0	0	13	1	0	2391.841
UGA	500	1975	2456.753	0	0	14	1	0	2419.035
UGA	500	1976	2509.976	0	0	15	1	0	2456.753
UGA	500	1977	2581.87	0	0	16	1	0	2509.976
UGA	500	1978	2652.709	1	1	17	1	0	2581.87
UGA	500	1979	2736.964	1	1	18	1	0	2652.709
UGA	500	1980	2810.741	1	0	19	1	0	2736.964
UGA	500	1981	2862.124	1	0	20	1	0	2810.741
UGA	500	1982	2941.536	1	0	21	1	0	2862.124
UGA	500	1983	2993.962	1	0	22	1	0	2941.536
UGA	500	1984	3087.265	1	0	23	1	0	2993.962
UGA	500	1985	3155.858	1	0	24	1	0	3087.265
UGA	500	1986	3215.112	1	0	25	1	0	3155.858
UGA	500	1987	3294.743	1	0	26	1	0	3215.112
UGA	500	1988	3380.563	1	0	27	1	0	3294.743
UGA	500	1989	3486.992	1	0	28	1	0	3380.563
UGA	500	1990	9319.499	1	0	29	1	1	3486.992
UGA	500	1991	9527.957	1	0	30	1	1	9319.499
UGA	500	1992	9790.24	1	0	31	1	1	9527.957
UGA	500	1993	9996.09	1	0	32	1	1	9790.24
UGA	500	1994	10222.23	1	0	33	1	1	9996.09
UGA	500	1995	10341.02	1	0	34	1	1	10222.23
UGA	500	1996	10530	1	0	35	1	1	10341.02
UGA	500	1997	10712.12	1	0	36	1	1	10530
UGA	500	1998	10788.72	1	0	37	1	1	10712.12
UGA	500	1999	10949.24	1	0	38	1	1	10788.72

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.” “Measdum” and “measdum2” control for changes in the source material in the measurement of energy consumption.

Table 11: War Over Angola

stateabb	ccode	year	pec	level	shock	time	measdum	measdum2	pec_L1
SAF	560	1955	28473	0	0	1	0	0	.
SAF	560	1956	29762	0	0	2	0	0	28473
SAF	560	1957	30795	0	0	3	0	0	29762
SAF	560	1958	32847	0	0	4	0	0	30795
SAF	560	1959	32287	0	0	5	0	0	32847
SAF	560	1960	33810	0	0	6	0	0	32287
SAF	560	1961	35043	0	0	7	0	0	33810
SAF	560	1962	36563	0	0	8	0	0	35043
SAF	560	1963	37656	0	0	9	0	0	36563
SAF	560	1964	40082	0	0	10	0	0	37656
SAF	560	1965	42622	0	0	11	0	0	40082
SAF	560	1966	41869	0	0	12	0	0	42622
SAF	560	1967	43728	0	0	13	0	0	41869
SAF	560	1968	46215	0	0	14	0	0	43728
SAF	560	1969	47438	0	0	15	0	0	46215
SAF	560	1970	74460.77	0	0	16	1	0	47438
SAF	560	1971	82575.63	0	0	17	1	0	74460.77
SAF	560	1972	84555.09	0	0	18	1	0	82575.63
SAF	560	1973	88699.52	0	0	19	1	0	84555.09
SAF	560	1974	92611.17	0	0	20	1	0	88699.52
SAF	560	1975	100335.7	1	1	21	1	0	92611.17
SAF	560	1976	104292.6	1	1	22	1	0	100335.7
SAF	560	1977	108868.1	1	0	23	1	0	104292.6
SAF	560	1978	110735.5	1	0	24	1	0	108868.1
SAF	560	1979	117340.1	1	0	25	1	0	110735.5
SAF	560	1980	126267	1	0	26	1	0	117340.1
SAF	560	1981	141718.3	1	0	27	1	0	126267
SAF	560	1982	149603.9	1	0	28	1	0	141718.3
SAF	560	1983	156497	1	0	29	1	0	149603.9
SAF	560	1984	193019.2	1	0	30	1	1	156497
SAF	560	1985	197429.3	1	0	31	1	1	193019.2
SAF	560	1986	203169.7	1	0	32	1	1	197429.3
SAF	560	1987	200038.1	1	0	33	1	1	203169.7
SAF	560	1988	208840.8	1	0	34	1	1	200038.1
SAF	560	1989	208980.3	1	0	35	1	1	208840.8
SAF	560	1990	205838.8	1	0	36	1	1	208980.3
SAF	560	1991	212413.6	1	0	37	1	1	205838.8
SAF	560	1992	202857.7	1	0	38	1	1	212413.6
SAF	560	1993	219542.3	1	0	39	1	1	202857.7
SAF	560	1994	230665.5	1	0	40	1	1	219542.3
SAF	560	1995	219734.2	1	0	41	1	1	230665.5
SAF	560	1996	209427.4	1	0	42	1	1	219734.2

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.” “Measdum” and “measdum2” control for changes in the source material in the measurement of energy consumption.

Table 12: War Over the Aouzou Strip

stateabb	ccode	year	pec	level	shock	time	measdum	measdum2	measdum3	pec_L1
CHA	483	1966	3	0	0	1	0	0	0	.
CHA	483	1967	3	0	0	2	0	0	0	3
CHA	483	1968	4	0	0	3	0	0	0	3
CHA	483	1969	5	0	0	4	0	0	0	4
CHA	483	1970	189.3702	0	0	5	1	0	0	5
CHA	483	1971	193.8475	0	0	6	1	0	0	189.3702
CHA	483	1972	197.6446	0	0	7	1	0	0	193.8475
CHA	483	1973	202.4337	0	0	8	1	0	0	197.6446
CHA	483	1974	206.2968	0	0	9	1	0	0	202.4337
CHA	483	1975	210.1032	0	0	10	1	0	0	206.2968
CHA	483	1976	214.3441	0	0	11	1	0	0	210.1032
CHA	483	1977	230.6358	0	0	12	1	0	0	214.3441
CHA	483	1978	239.0925	0	0	13	1	0	0	230.6358
CHA	483	1979	239.0074	0	0	14	1	0	0	239.0925
CHA	483	1980	242.8177	0	0	15	1	0	0	239.0074
CHA	483	1981	254.2995	0	0	16	1	0	0	242.8177
CHA	483	1982	264.2003	0	0	17	1	0	0	254.2995
CHA	483	1983	269.9514	0	0	18	1	0	0	264.2003
CHA	483	1984	266.7263	0	0	19	1	0	0	269.9514
CHA	483	1985	266.5223	0	0	20	1	0	0	266.7263
CHA	483	1986	276.6704	1	1	21	1	0	0	266.5223
CHA	483	1987	290.2118	1	1	22	1	0	0	276.6704
CHA	483	1988	295.7563	1	0	23	1	0	0	290.2118
CHA	483	1989	305.1658	1	0	24	1	0	0	295.7563
CHA	483	1990	1471.284	1	0	25	1	1	0	305.1658
CHA	483	1991	1492.209	1	0	26	1	1	0	1471.284
CHA	483	1992	1533.601	1	0	27	1	1	0	1492.209
CHA	483	1993	1592.616	1	0	28	1	1	0	1533.601
CHA	483	1994	1627.202	1	0	29	1	1	0	1592.616
CHA	483	1995	1657.098	1	0	30	1	1	0	1627.202
CHA	483	1996	1695.366	1	0	31	1	1	0	1657.098
CHA	483	1997	1737.064	1	0	32	1	1	0	1695.366
CHA	483	1998	1781.368	1	0	33	1	1	0	1737.064
CHA	483	1999	1827.348	1	0	34	1	1	0	1781.368
CHA	483	2000	1873.084	1	0	35	1	1	0	1827.348
CHA	483	2001	1909.201	1	0	36	1	1	0	1873.084
CHA	483	2002	1945.959	1	0	37	1	1	0	1909.201
CHA	483	2003	2084.698	1	0	38	1	1	1	1945.959
CHA	483	2004	2114.753	1	0	39	1	1	1	2084.698
CHA	483	2005	2160.812	1	0	40	1	1	1	2114.753
CHA	483	2006	2195.95	1	0	41	1	1	1	2160.812
CHA	483	2007	2216.756	1	0	42	1	1	1	2195.95

Note: The energy consumption variable is labelled “pec,” for “primary energy consumption.” The lag variable is labelled “pec_L1.” “Measdum,” “measdum2,” and “measdum3” control for changes in the source material in the measurement of energy consumption.

APPENDIX C
ENERGY CONSUMPTION CHARTS

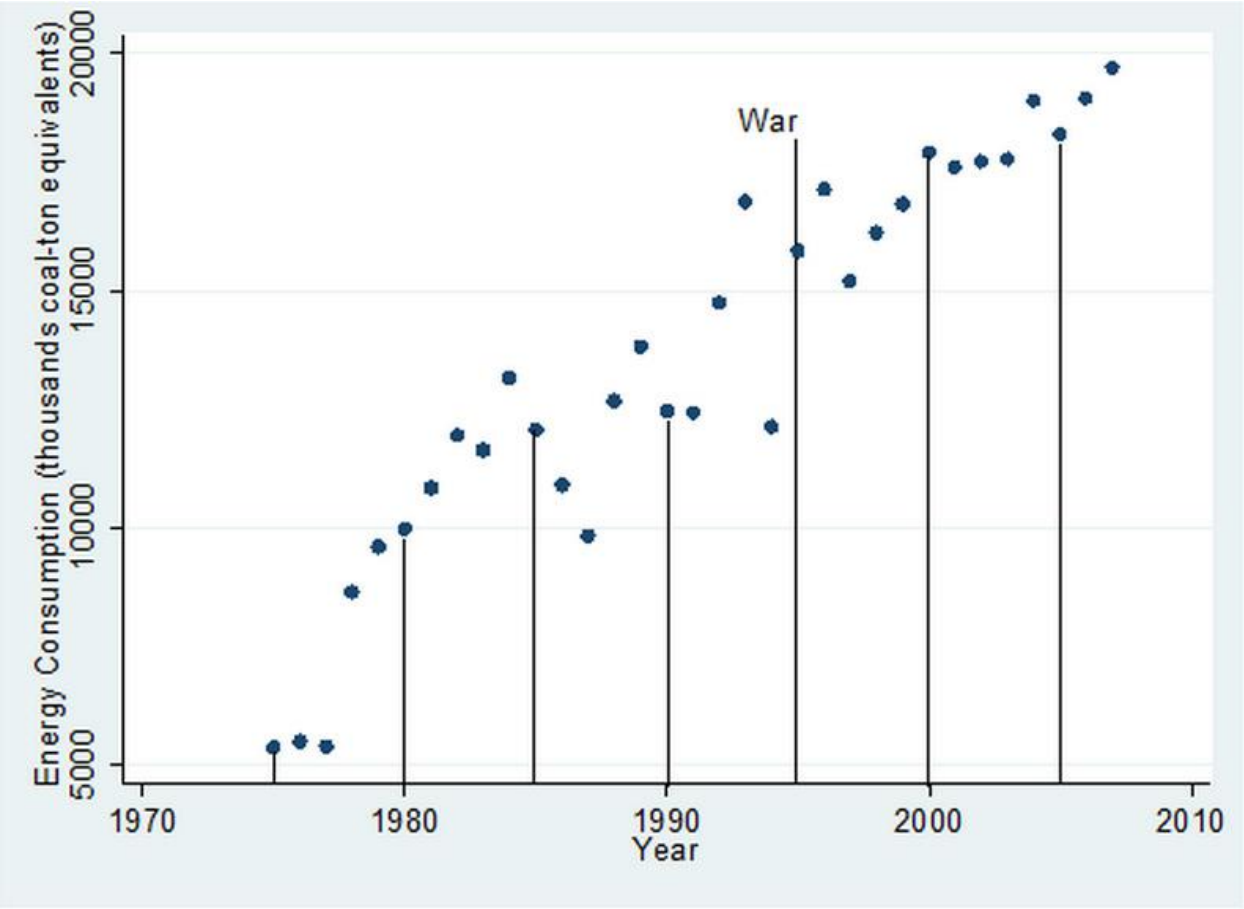

Figure 1: Cenepa Valley War, Ecuador energy consumption 1975-2007

Source: National Material Capabilities dataset version 4.0

Figure 2: Falkland Islands War, Argentina energy consumption 1962-2002

Source: National Material Capabilities dataset version 4.0

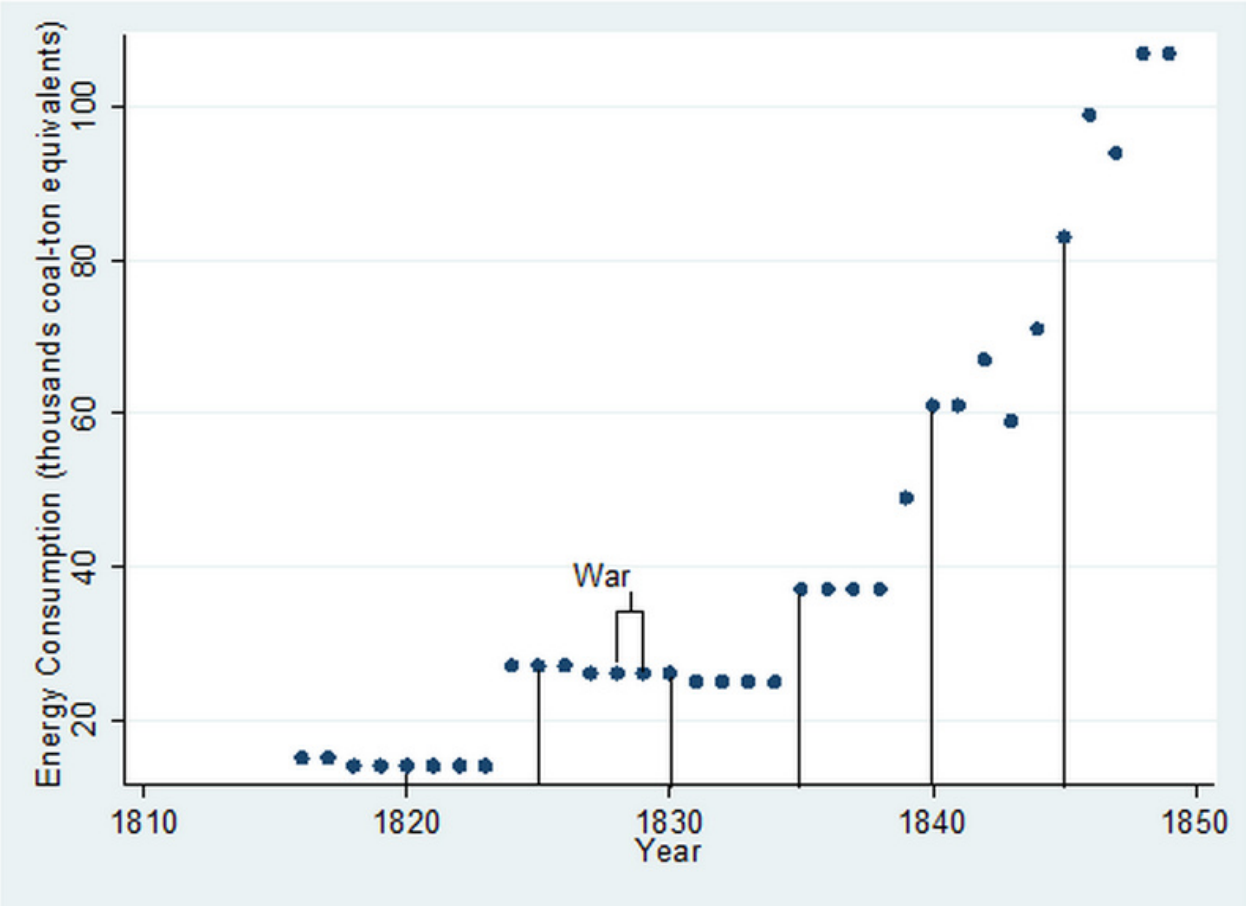

Figure 3: First Russo-Turkish War, Russia energy consumption 1816-1849

Source: National Material Capabilities dataset version 4.0

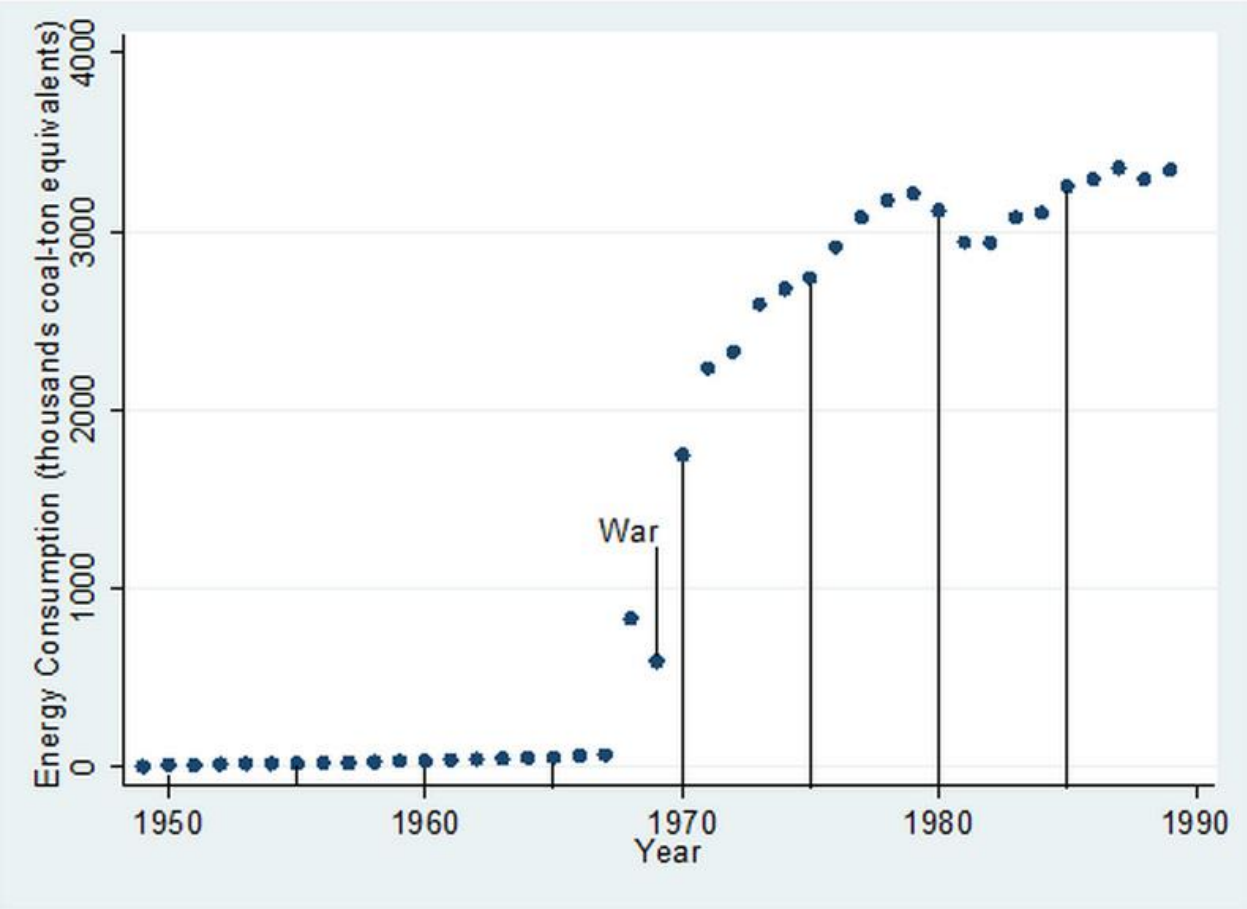

Figure 4: Football War, El Salvador energy consumption 1949-1989

Source: National Material Capabilities dataset version 4.0

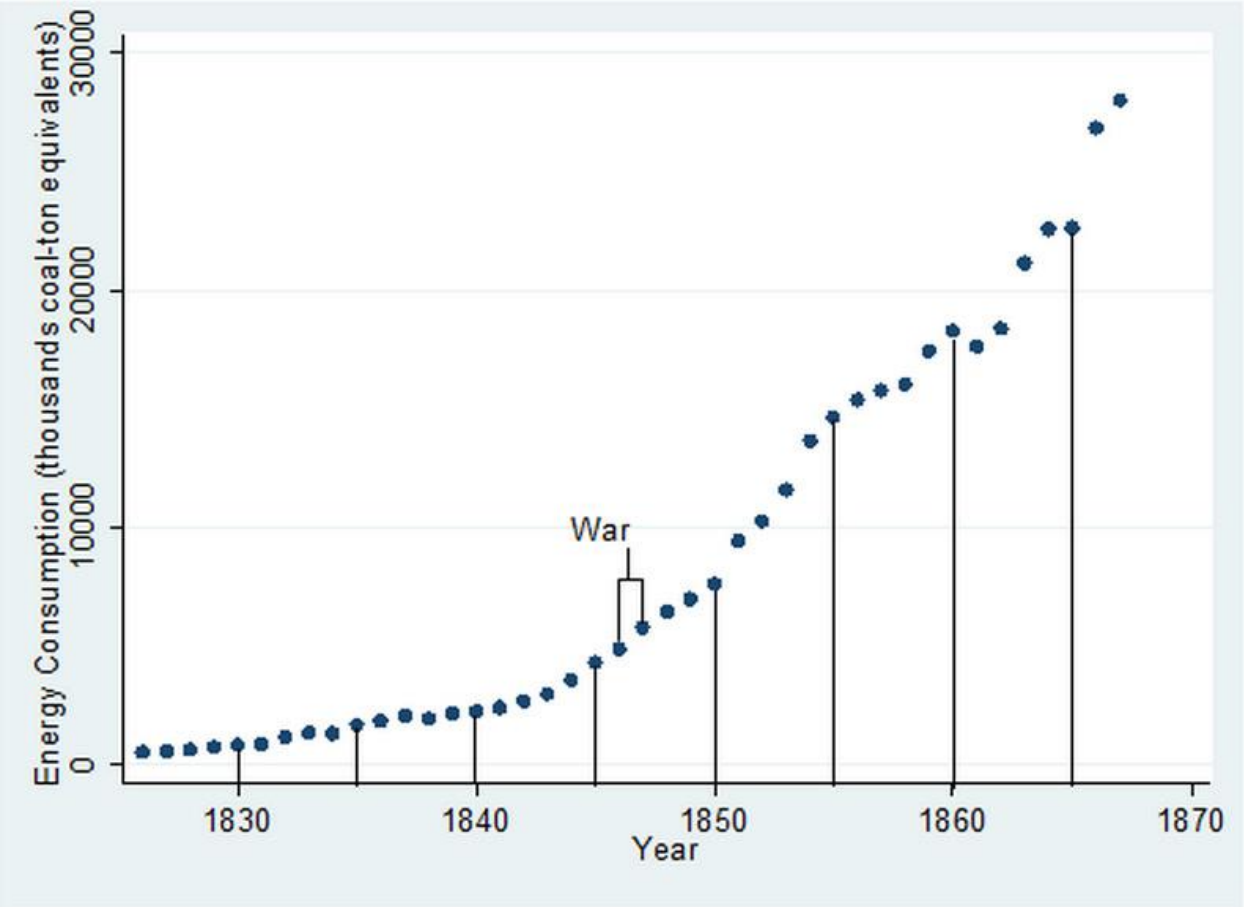

Figure 5: Mexican-American War, USA energy consumption 1826-1867

Source: National Material Capabilities dataset version 4.0

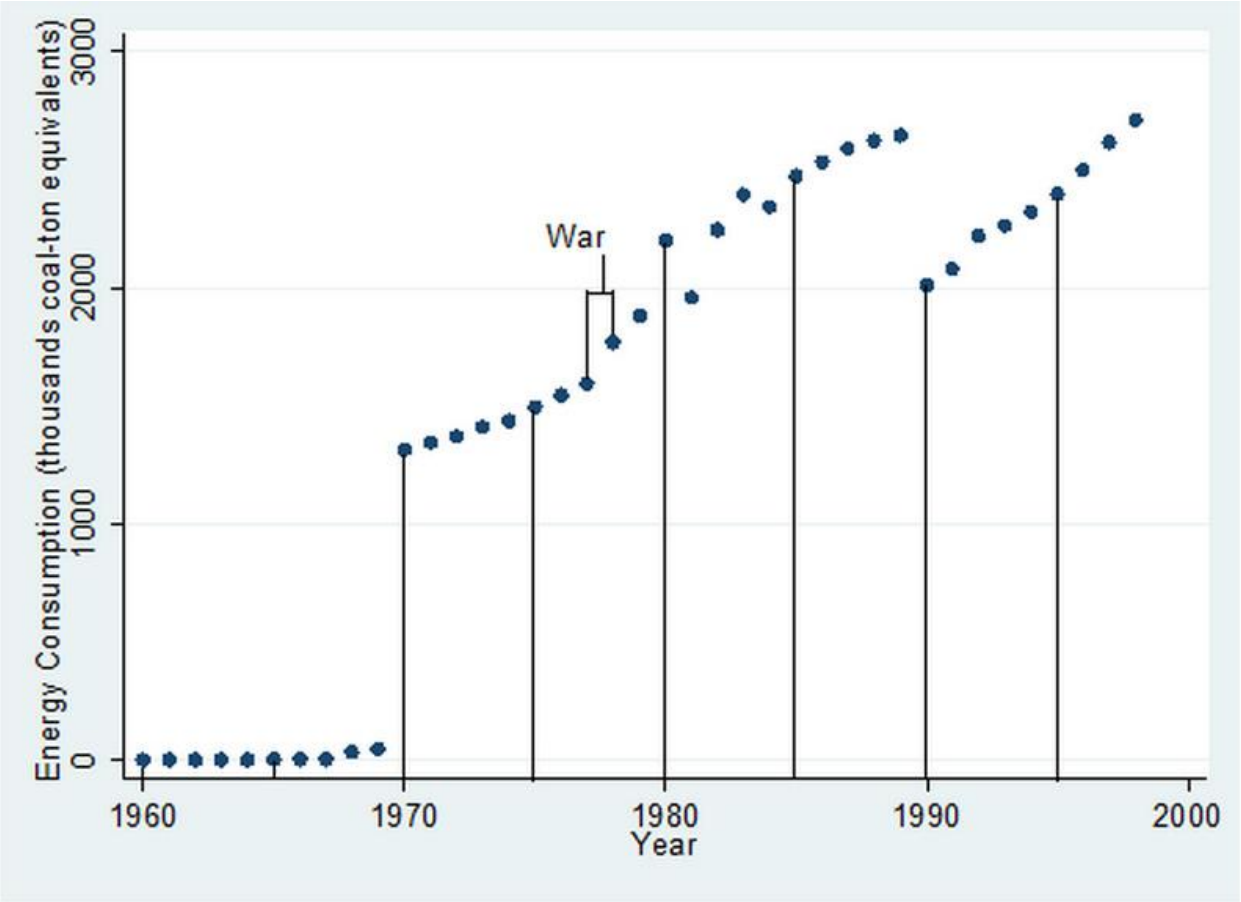

Figure 6: Second Ogaden War, Phase 2, Somalia energy consumption 1977-1978

Source: National Material Capabilities dataset version 4.0

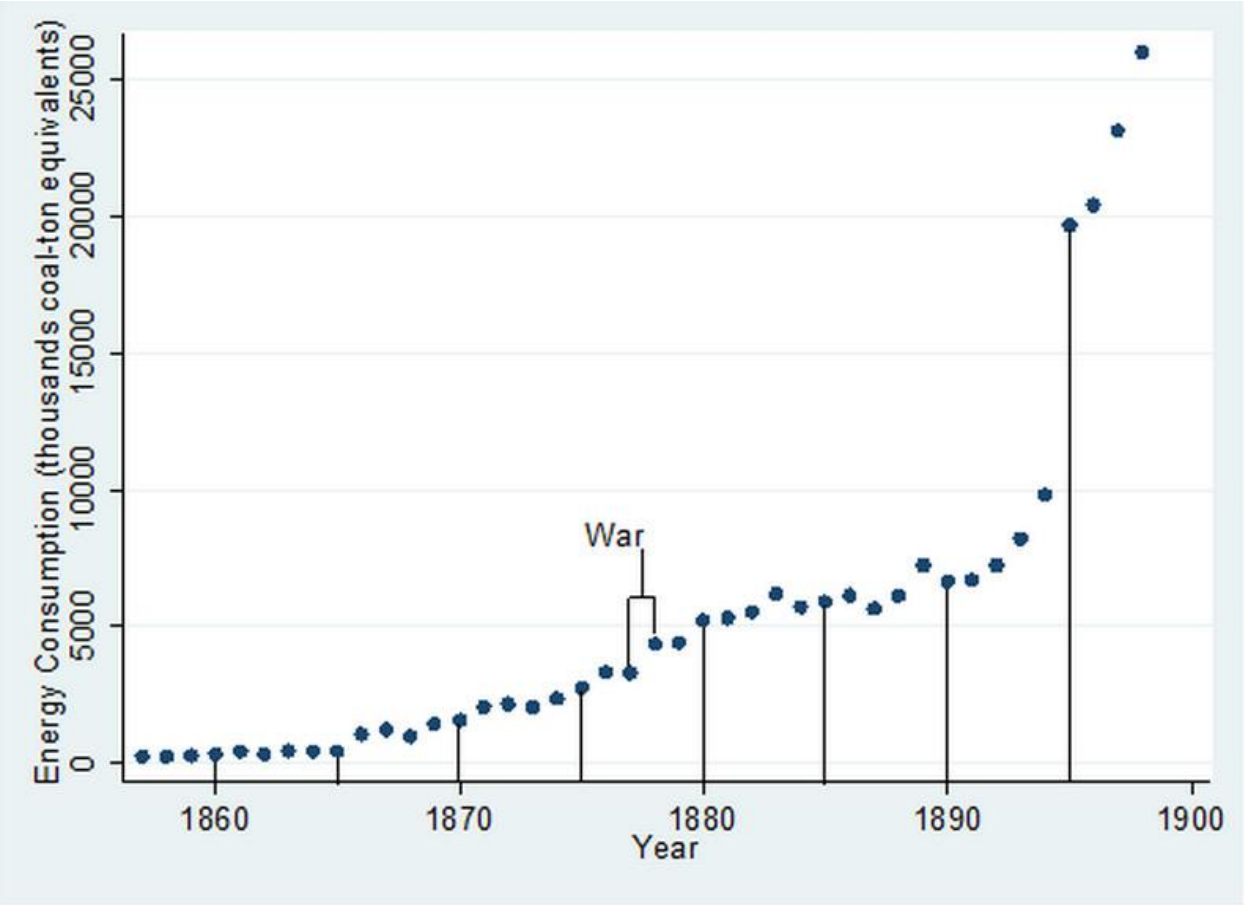

Figure 7: Second Russo-Turkish War, Russia energy consumption 1857-1898

Source: National Material Capabilities dataset version 4.0

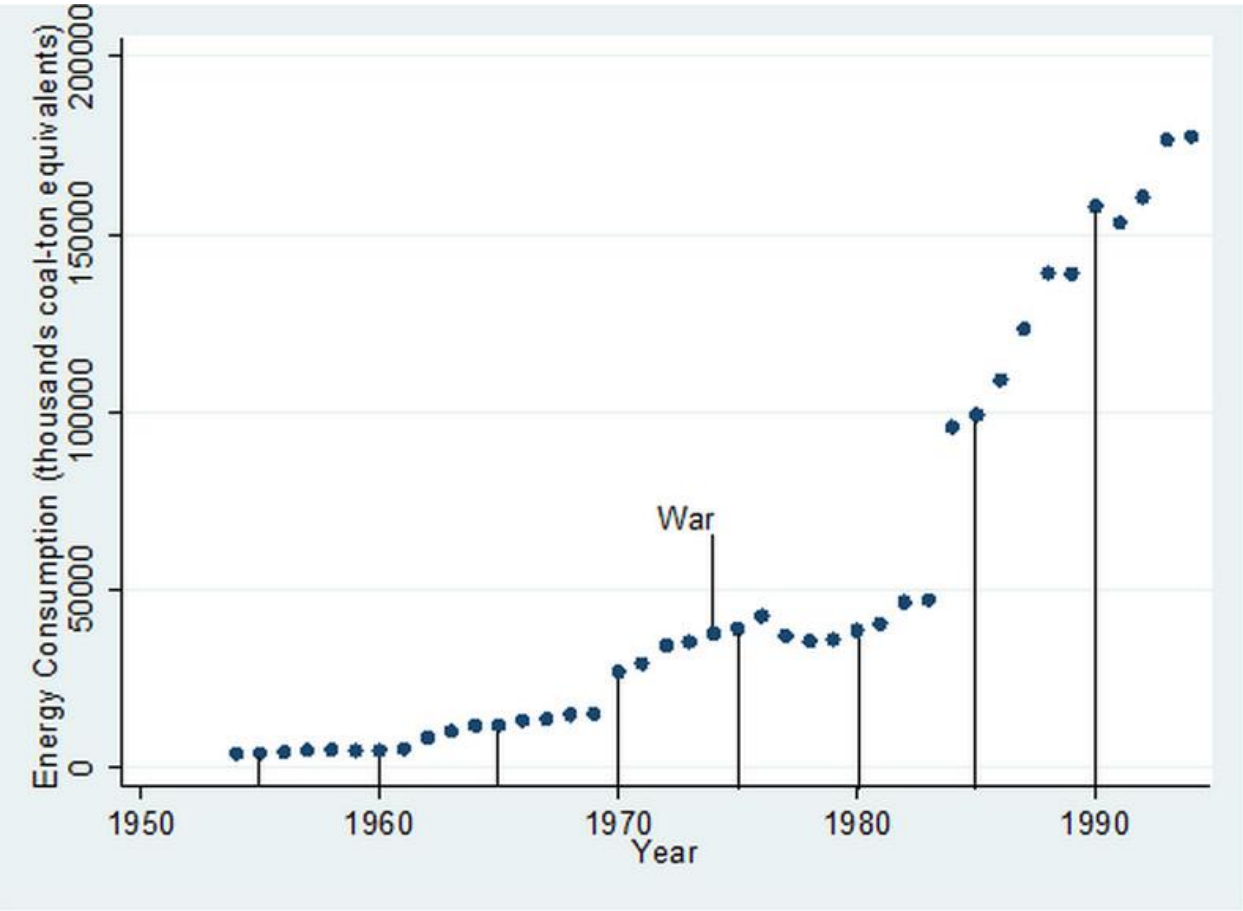

Figure 8: Turco-Cypriot War, Turkey energy consumption 1954-1994

Source: National Material Capabilities dataset version 4.0

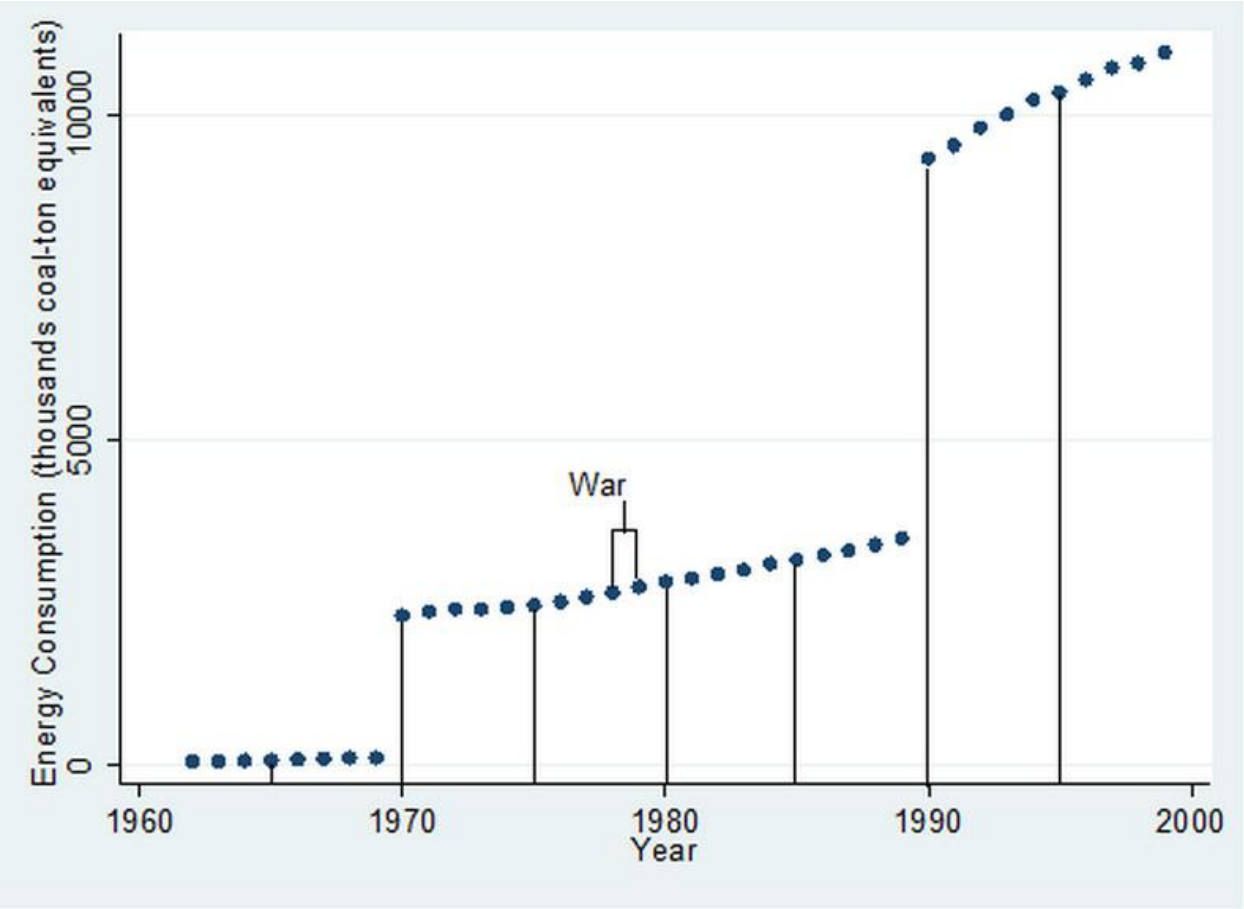

Figure 9: Ugandan-Tanzanian War, Uganda energy consumption 1962-1999

Source: National Material Capabilities dataset version 4.0

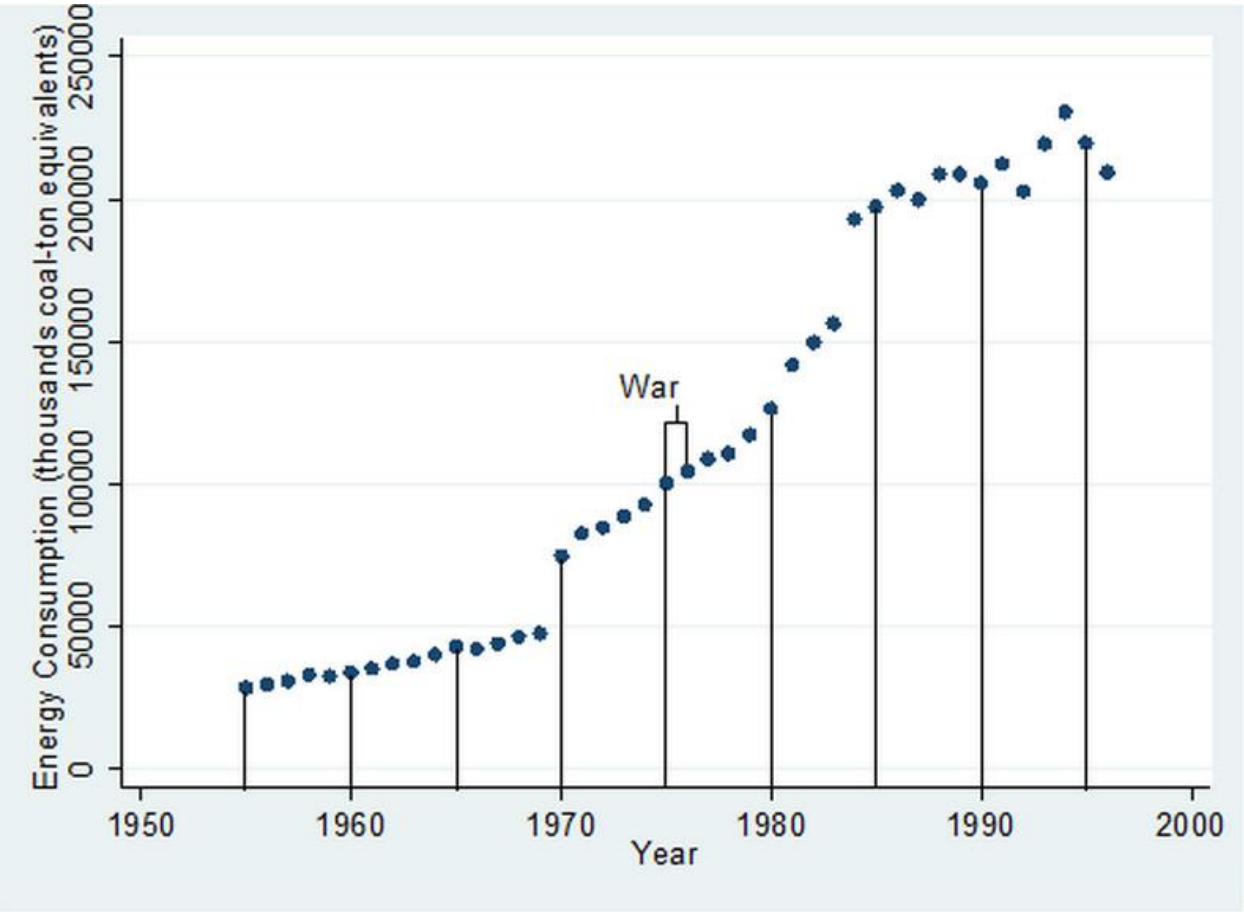

Figure 10: War Over Angola, South Africa energy consumption 1955-1996

Source: National Material Capabilities dataset version 4.0

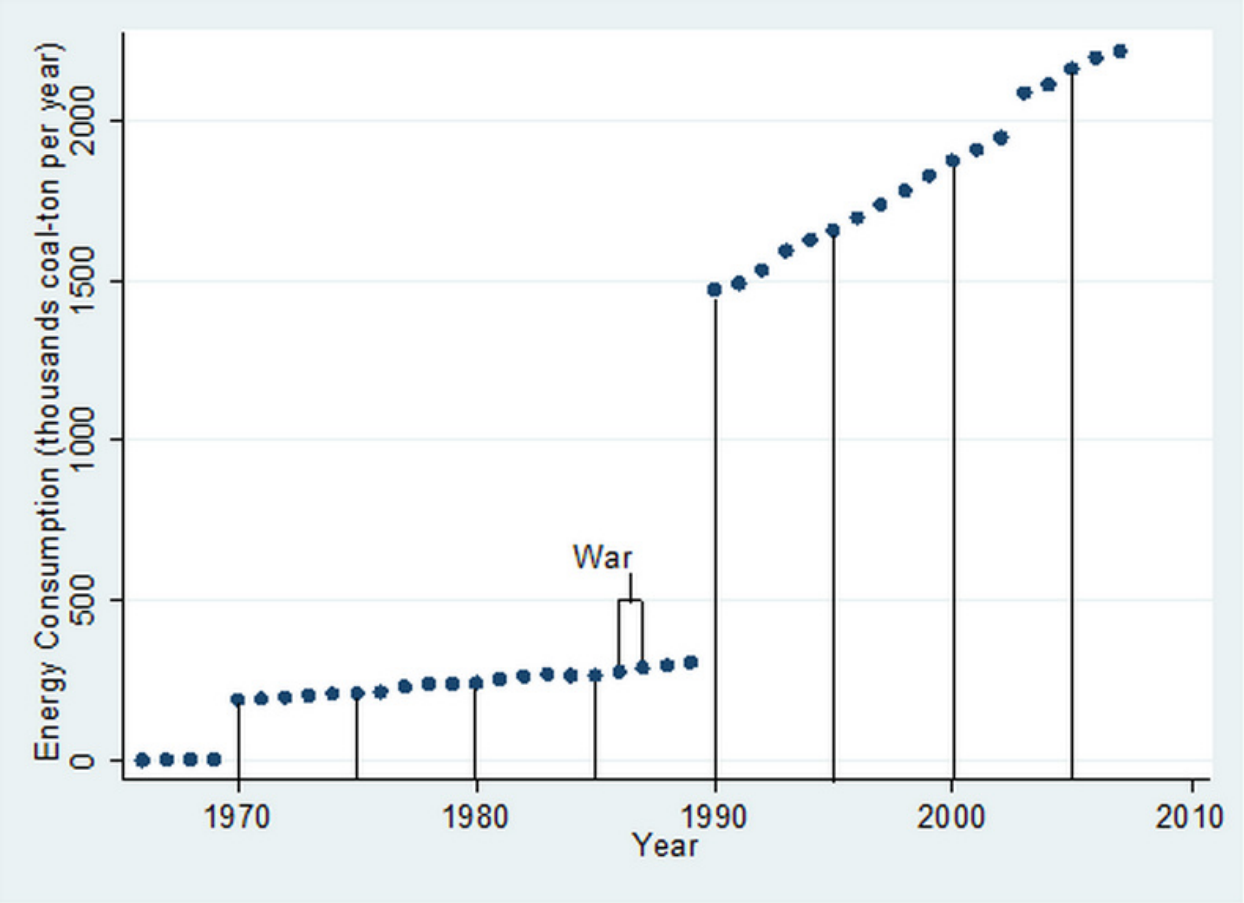

Figure 11: War Over the Aouzou Strip, Chad energy consumption 1986-1987

Source: National Material Capabilities dataset version 4.0

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