

DETERMINANTS OF WAR: TO WHAT EXTENT DO POLITICAL AND ECONOMIC
FREEDOM DETERMINE MILITARY EFFECTIVENESS?

by

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Determinants of War: To What Extent do Political and Economic Freedom Determine Military
Effectiveness?

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Abstract

Much of the literature focusing on peace and conflict studies has been severely limited in both scope and depth. This paper extends the previous research and looks to political and economic freedom as a cause of determining military effectiveness.

Data of Military Interstate Disputes from the Correlates of War Project is used from the period of 1950 to 1992, over a large sample of countries to assemble an accurate and reliable foundation to test the effects of several liberal variables on military effectiveness. Two different models are used, first a simple logistic regression, followed by the more complex multinomial logistic regression. The results are found to generally support the hypothesis, that to some extent political and economic freedom can determine military effectiveness.

Table of Contents

I.	Introduction	1
II.	Previous Research	3
	a. Political and Economic Factors Affecting Conflict Initiation	4
	b. Political and Economic Factors Affecting Conflict Resolution	7
III.	The Data	11
	a. Dependent Variable	17
	b. Independent Variables	20
	c. Additional Variables	22
IV.	The Model	24
	a. Logistic Regression	25
	b. Multinomial Logistic Regression	25
V.	Results	28
	a. Logistic Regression Results	28
	b. Multinomial Logistic Regression Results	30
	c. Analysis of the Parameters	32
VI.	Conclusions	36
VII.	Appendices	39
VIII.	Works Cited	41

I. Introduction

War is fighting and operates in a peculiar element—danger. But war is served by many activities quite differently from it, all of which concern the maintenance of the fighting forces. These preparatory activities are excluded from the narrower meaning of the art of war—the actual conduct of war, because they are concerned only with the creation, training, and maintenance of the fighting forces. The theory of war proper, on the other hand, is concerned with the use of these means, once they have been developed, for the purposes of the war.

Carl von Clausewitz, *On War*

For centuries, military strategists and leaders alike have concentrated and examined, dissected and analyzed, labored and enslaved millions of hours to the study of war. The idea of total victory has ensnared the imagination of thousands throughout the centuries and has led to the consumption of unimaginable amounts of resources, capital, and time. Yet, as Clausewitz states above, the tapestry of war is embroidered with more than just the threads of the military and conduct; to be exact, details of governmental regimes and commerce decisions may weave the very fundamental design for which the war will take form. This brings one to the question at hand; to what extent can political and economic freedom determine military effectiveness?

In the Second Treatise of Civil Government, John Locke stated that

If man in the state of nature be so free, as has been said; if he be absolute lord of his own person and possessions, equal to the greatest, and subject to no body, why will he part with his freedom? Why will he give up this empire, and subject himself to the dominion and control of any other power? To which it is obvious to answer, that though in the state of nature he hath such a right, yet the enjoyment of it is very uncertain, and constantly exposed to the invasion of others: . . . the enjoyment of the property he has in this state is very unsafe, very insecure.

Men join together and form a government to better secure both their rights and their possessions. From an economic standpoint, government merely serves as a more efficient way of allocating resources, in which protection from nonmembers of the state is the public good. Why then, can the same analysis not be applied to war? War is only a contest, in which it functions in much the same way as any economic market. At last, some equilibrium will be reached between buyers and sellers, aggressors and defenders. Indeed, resource allocation during a war can be spent fighting or saved contributing to a productive activity. Paul Collier (2000) determines that there are two types of war from which all other ideas are derived, greed-based and grievance-based.¹ Whether greed or grievance based, war in the analysis of this paper will follow the definition set forth by St. Thomas Aquinas in *Summa Theologica*, which captures the foundational *Just War*

¹ Collier, Paul “*Greed and Grievance in Civil War*” (University of Oxford - Department of Economics and World Bank Policy Research Working Paper No. 2355) Available from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=630727.

Theory. Simply stated, in order for war to exist, it must be declared by a legitimate theory. This definition functions to add both validity and constraint to the study.²

Much of the previous research on the study of war has looked exclusively to strategic prowess and technological advancements as a leading cause to victory. But perhaps instead of looking towards these “post-factors” as causes of victory, we should instead look to the foundational factors that often set the stage for a country’s acquisition of these products. Namely, do political and economic freedom determine military effectiveness because they in turn allowed the development of the post-factors?

II. Previous Research

With such a rich assortment of data available and the extensive time period it spans, the vastness of conflict data has attracted the attention of numerous scholars. Data on nearly all aspects of conflict is available from a rich variety of sources such as the United Nations, the Correlates of War Project, EUGene, and Free the World. Conflict data has served the purpose of clarifying the relationships between militaries and governments, alliances and aggressors and war and peace. As such, many of these investigations have been analyzed in particular by governments and institutions, while relatively speaking, the social sciences have paid little attention. A careful probe of the related literature has provided that in recent years, numerous advancements have increased knowledge in the field and has had profound effects on the study of war and

² Aquinas, St. Thomas “*Summa Theologica*” trans. Fathers of the English Dominican Province (Benziger Bros. edition, 1947) Available from <http://www.ccel.org/a/aquinas/summa/SS/SS040.html>).

conflict. To facilitate navigation of the literature, this paper will subdivide the previous research into factors that affect conflict initiation and then resolution.

A. Political and Economic Factors Affecting Conflict Initiation

One of the first modern scholars to study war, Immanuel Kant, in his 1795 essay *Perpetual Peace: A Philosophical Sketch*, postulated that "republican constitutions," a "commercial spirit" of international trade, and a federation of interdependent republics would provide the basis for perpetual peace.³ Conventionally speaking, to describe Kant's theories on warfare as modern, is to refer to an idea that breaks from the ancient school of thought, the scholasticism that predominated the Middle Ages; a break that was established by René Descartes and his work on reason and method. Providing one of the strongest and earliest foundations for achieving international peace, Kant described in detail what would later be referred to as the "Kantian tripod."⁴ Although to many, the idea of perpetual peace seems romantic and unattainable, Kant wrote not as an idealist, but rather as a realist, providing concrete statements on achieving his aims. Fanciful as it might seem, the alternative, Kant stated was "a vast grave where all the horrors of violence and those responsible for them would be buried."⁵ In the first leg, Kant believed that only through a republican government can the juridical legislation of the people be based, therefore establishing the principles of freedom for men, dependence on society and equality of citizens. To Kant, if the consent of the citizens is required for decisions

³ Kant Immanuel, *Perpetual Peace: A Philosophical Sketch*, ed. James Bohman and Matthias Lutz-Bachmann (MIT Press, 1997).

⁴ Ibid.

⁵ Ibid.

made within society, then consent of the citizens would also be required for war. Because of the known horrors of war, he reasoned that men would be “cautious in commencing such a poor game”⁶ and in any other form of government, “war is the easiest thing in the world to decide upon, because war does not require of the ruler, who is the proprietor and not a member of the state, the least sacrifice of the pleasures of his table, the chase, his country houses, his court functions, and the like.”⁷ This first idea correlates well with the hypothesis that democratic governments should be less likely to go to war because of the involved decision making and the needed consent of the governed.

In *The Kantian Peace: The Pacific Benefits of Democracy, Interdependence, and International Organizations, 1885-1992*, John R. Oneal and Bruce Russett further analyze Kant’s study on perpetual peace by looking next to the second leg of the triangle, economic interdependence. By intertwining economic dependence, states are drawn into a “web of mutual self interest that constrains them from using force against one another.”⁸ By this, states must weigh the options of war in a cost-benefit analysis and decide whether or not the war outweighs realistic loss of such trading partner. In the final leg, a world of independent states, Kant envisions a federation of independent states, because he fears the outcomes in an international anarchy of states.

Looking to an economic standpoint, Erik Gartzke, in his essay for the *The American Journal of Political Science* entitled “The Capitalist Peace,” shows that other

⁶ Kant Immanuel, *Perpetual Peace: A Philosophical Sketch*, ed. James Bohman and Matthias Lutz-Bachmann (MIT Press, 1997).

⁷ Ibid.

⁸ Oneal John R. and Russet Bruce M., “The Kantian Peace: The Pacific Benefits of Democracy, Interdependence, and International Organizations, 1885-1992” *World Politics* - Volume 52, Number 1, (October 1999), pp. 1-37 [journal online]. Published by: The Johns Hopkins University Press. Available from <http://www.jstor.org/stable/25054099> ; Internet. Accessed 26/04/2009.

researchers have found Kant's research wrong. Although democracies are indeed less likely to fight each other, they are no less ready to use force in general. In fact, this analysis can only be applied to established democracies because research has shown that developing democracies are as war-prone as dictatorships. Instead, Gartzke calls upon scholars from the liberal political economy to show that capitalism has a greater effect on decisions to use force than regime type. Indeed, Montesquieu, Adam Smith, Richard Cobden, Norma Agnell, and Richard Rosecrance have long suggested that free markets and economic dependency have the ability to free states from the looming prospect of recurrent warfare.⁹ War becomes unappealing and or unnecessary because "free markets create another venue to competition among countries, often containing minor conflicts below the level of military force."¹⁰ These ideas have evolved through the centuries, transforming both economic and international affairs. Conquest becomes an anachronism as it becomes both unprofitable and expensive; modern wealth is harder to vanquish than was the case many centuries ago. Gartzke has taken this idea and postulated that in fact, economic freedom may be one of the only factors that discourage conflict among nations.¹¹ To this end, he asserts that although democracy may be inherently desirable, it does little to prevent, reduce, or lessen conflict. Particularly in younger democracies, but especially in regions dominated by antidemocratic governments, democracies have little influence on cooperation and an even smaller impact on neighboring territories. To this

⁹ Gartzke Erik, "The Capitalist Peace."
American Journal of Political Science, Vol. 51, No. 1 (Jan., 2007), pp. 166-191[journal online].
Published by: Midwest Political Science Association. Available from
<http://www.jstor.org/stable/4122913>; Internet. Accessed: 26/04/2009.

¹⁰ Gartzke Erik, "The Capitalist Peace."
American Journal of Political Science, Vol. 51, No. 1 (Jan., 2007), pp. 166-191[journal online].
Published by: Midwest Political Science Association. Available from
<http://www.jstor.org/stable/4122913>; Internet. Accessed: 26/04/2009.

¹¹ Ibid.

end, Gartzke is able to attribute that democracy and economic prosperity are cut from the same cloth. Democratic countries with repressed economic policies have little hope of prospering, while autocratic countries have a higher chance trajectory, is the central issue for international scholars today.¹² Indeed it would appear that the greater the dependence upon other nations, the more calculated and less flippant the decision to go to war would be. Similarly, the more democratic these nations are, the stronger the decision making process and greater analysis of pre-war factors.

In a preliminary paper by Vincent Vicard entitled “Trade, War and Political Integration: the Regional Interplays,” he illustrates the essence of the “trade promotes peace argument.” Vicard states that to fully understand the hypothesis, one must look to a simple opportunity cost analysis. “Because states sharing economic linkages benefit from it, war, which is said to shut those linkages down, is costly. Hence, the prospect of higher war cost is said to deter economically interdependent states from resorting to violence to solve their disputes. Interdependence would therefore foster diplomacy and lead to peace.”¹³

B. Political and Economic Factors Affecting Conflict Resolution

In later years, researchers of war around the world would look to Kant’s theories as a springboard for sharpening the link between war and government, trade and interdependence. In 2004, Stephen Biddle and Stephen Long published “Democracy and

¹² Biddle Stephen and Long Stephen, “Democracy and Military Effectiveness: A Deeper Look.” *The Journal of Conflict Resolution*, Vol. 48, No. 4 (Aug., 2004), pp. 525-546 [journal online]. Published by: Sage Publications, Inc. Available from <http://www.jstor.org/stable/4149807>; Internet. Accessed: 26/04/2009.

¹³ Vicard Vincent, “Trade, War, and Political Integration: the Regional Interplays” (June 2005). Available from: <http://team.univ-paris1.fr/teamperso/DEA/Actualites/Doctoriales/vicard.pdf>; Internet. Accessed: 05/05/2009.

Military Effectiveness: A Deeper Look,” and refined the analysis as to why democracies are unusually successful in war. Democracy, they state, is much more than a system of government. By its very definition, democracy encompasses a complex knot of qualities, many of which are inherent to its existence. In a democracy, the government is wholly responsible to the citizenry and is subject to multiple checks and balances from within and without. Competition from within serves to increase economic performance, produce superior human capital and congruent civil-military relations. From without, economic sanctions keep democracy from rash decision. Biddle and Long grant the notion that perhaps these attributes are spurious; if present only in a democracy, does the democracy imply the results, or do the results imply the democracy? The authors conclude that it matters not which comes first, but rather that in conclusion one cannot exist without the other, strengthening the exclusive bond between the two. Taking this into account, the study concluded that attributing military success, or battlefield effectiveness, solely to democracy is a result of the attributes mentioned above.

What the authors state as important to remember, is that in their data, “ceteris paribus, democratic political organization per se does not increase battlefield prowess.”¹⁴ Simply stated, while democracy may not be conducive to enhanced proficiency, democracies do tend to select wars in which the advantages they do possess outweigh their disadvantages. Everything in Biddle and Long’s work goes back to their central theme: do democracies win militarily because they are democracies, or do they win because democracies include successful attributes? Within Biddle’s own work, in his

¹⁴ Biddle Stephen and Long Stephen, “Democracy and Military Effectiveness: A Deeper Look.” *The Journal of Conflict Resolution*, Vol. 48, No. 4 (Aug., 2004), pp. 525-546 [journal online]. Published by: Sage Publications, Inc. Available from <http://www.jstor.org/stable/4149807>; Internet. Accessed: 26/04/2009.

book titled *Military Power*, he instead looks to force employment as reason for victory. Although their study provided an important starting point for international relations and military theory, the authors admit that on the whole, the subject is woefully understudied. Indeed, Biddle states that “[t]oday, most analyses are either rigorous but narrow, or broad but unrigorous. Real progress demands rigor and breadth: a systematic treatment of both material and nonmaterial variables, backed up with a combination of empirical evidence and careful deductive reasoning.”¹⁵

Often when one studies democracies, a close correlation between political freedom and economic freedom exists. While democracies may imply free trade, free trade does not always imply democracy. If this is the case, what are the implications of economic freedom upon politically repressed nations? Indeed, a relationship exists between trade and conflict. No country is able to completely produce the goods they need. Countries find it advantageous to specialize, and trade naturally arises from this. This expected outcome is not artificially produced; rather it emerges due to equal need from two or more countries. This natural phenomenon creates a link that is neither forced nor mandated. Solomon Polacheck (1980) analyzed this link, postulating that trade brings diminished hostility swifter than third party dictum. He states that peace imposed by others is inherently unstable because in the majority of instances, the underlying differences remain. Peace through trade, however, exists naturally through a mutual agreement exclusively between the involved parties. The link between two countries is

¹⁵ Biddle Stephen, *Military Power: Explaining Victory and Defeat in Modern Battle* (Princeton University Press, 2006), 3.

based upon *mutual dependencies*.¹⁶ Because of their existence, mutual dependencies increase the cost of conflict, thereby increasing the incentives to cooperation.¹⁷ Polenchak presumes trade and mutual dependency as interchangeable, and for simplicity, this paper will also. Because economic interdependence is taken as a measure of mutual dependency, dyadic conflict, whilst holding other factors constant, has a negative correlation with dyadic trade patterns. Therefore, countries with more trading partners should have fewer conflicts. Additionally, Polenchak states that the stronger these dependencies, and more essential the trade, the greater the deterrent effect of trade on conflict.¹⁸

When evaluating much of the early research, much of the work that has been done within international relations has been “arguably theory-rich and data-poor, and, as a result, much of what passes today as theory is based largely upon speculation rather than arguments constructed from hard evidence.”¹⁹ To correct for this, in their research entitled “*Militarized Interstate Disputes, 1816-1992: Rationale, Coding Rules, and Empirical Patterns*,” Daniel Jones, Stuart Bremer, and J. David Singer focus largely on the Militarized Interstate Disputes contained within the Correlates of War Project. The project “has since its beginnings dedicated much time and energy to collecting and processing vast amounts of historical information covering nearly two centuries, in an attempt to identify and explain the empirical regularities that differentiate those disputes

¹⁶ Polachek Solomon, “Conflict and Trade” *Journal of Conflict Resolution* - Vol. 24, No. 1 (Mar., 1980), pp. 55-78 [journal online]. Published by: Sage Publications, Inc. Available from <http://www.jstor.org/stable/173934> ; Internet. Accessed 26/04/2009.

¹⁷ Ibid.

¹⁸ Ibid.

¹⁹ Jones Daniel, Stuart Bremer, and J. David Singer, “*Militarized Interstate Disputes, 1816-1992: Rationale, Coding Rules, and Empirical Patterns*.” *Conflict Management and Peace Science* – Vol. 15, No. 2 (1996), PP. 163-215 [journal online]. Available from ; Accessed 03/05/2009.

that do and do not escalate to war.”²⁰ Within this, a militarized interstate dispute refers to an even in which the “threat, display or use of military force” by one member state is directed to another. “Clearly, this purposely excludes interactions in disputes that did not become militarized.”²¹ Specifically, the term interstate restricts events to those which occur between “diplomatically recognized member states of the global system and excludes interactions involving non-recognized states or non-state actors.”²²

III. The Data

For as long as there has been conflict, there have been records of the events, growing in sophistication as time passes. To the modern researcher, data is available from a plethora of sources, including government records, university research, the United Nations, the Correlates of War Project, and the CDB90.

The two largest and most prominent datasets used in peace and conflict studies are the United States Army’s CDB90 (or HERO) and the Correlates of War Project. While both of these databases were employed in the previously mentioned research, this paper will only use data from the Correlates of War Project. The CDB90 dataset has a multitude of limitations and errors, many of which are highlighted within the actual research utilizing it. In particular, when examining the notes on the data contained within Biddle and

²⁰ Jones Daniel, Stuart Bremer, and J. David Singer, “Militarized Interstate Disputes, 1816-1992: Rationale, Coding Rules, and Empirical Patterns.” *Conflict Management and Peace Science* – Vol. 15, No. 2 (1996), PP. 163-215 [journal online]. Available from ; Accessed 03/05/2009.

²¹ Jones Daniel, Stuart Bremer, and J. David Singer, “Militarized Interstate Disputes, 1816-1992: Rationale, Coding Rules, and Empirical Patterns.” *Conflict Management and Peace Science* – Vol. 15, No. 2 (1996), PP. 163-215 [journal online]. Available from ; Accessed 03/05/2009.

²² Ibid.

Long's "Democracy and Military Effectiveness: A Deeper Look," Biddle himself comments on a few of the known problems. He states that "CDB90 has been extensively reviewed and extensively modified to remove errors identified in those reviews.[E]ight randomly selected battles with 159 codings were checked. Of these 159 values, 67% were found to be in error and 18% were judged "questionable."²³ The Army subsequently revised the data set in 1986 and again in 1987 to correct known errors, but the extent of remaining mistakes cannot be known. The data set's size makes exhaustive review prohibitive." Even within the text of his research, Biddle states that "[t]he resulting data are not perfect – coding errors doubtless remain..."²⁴ Despite the known problems with the CDB90 data, Biddle used the set anyways, opening his results to many of the problems contained within the data.

In another paper by Kristopher Ramsay of Princeton University entitled "Settling It on the Field: Battlefield Events and War Termination," more of the limitations of the CDB90 are discussed. Ramsay even compared the shortcomings of the database to the more reliable Correlates of War Project. From his paper, he states that :

[f]irst, there are issues of coverage. Generally, wars covered by the data set involve Western powers and Israel. There are a good number of wars – the Sino-Indian war, the Soccer War, and the Uganda – Tanzanian War, to name a few – that are classified as twentieth-century wars by the Correlates of War project but for which there are no data in CDB90. Even within the wars covered, there is variance in the level of detail. The Russo-

²³ Biddle Stephen and Long Stephen, "Democracy and Military Effectiveness: A Deeper Look." *The Journal of Conflict Resolution*, Vol. 48, No. 4 (Aug., 2004), pp. 525-546 [journal online]. Published by: Sage Publications, Inc. Available from <http://www.jstor.org/stable/4149807>; Internet. Accessed: 26/04/2009.

²⁴ Biddle Stephen and Long Stephen, "Democracy and Military Effectiveness: A Deeper Look." *The Journal of Conflict Resolution*, Vol. 48, No. 4 (Aug., 2004), pp. 525-546 [journal online]. Published by: Sage Publications, Inc. Available from <http://www.jstor.org/stable/4149807>; Internet. Accessed: 26/04/2009.

Finnish War, for example, has one battle (where there are arguably two), while the Okinawa has more than twenty recorded battles. Second, naval battles are not in the data set. For wars like the Russo-Japanese War, in which the naval battle of Tsushima is generally regarded as important, this is a limitation.²⁵

More than this, Ramsay agrees that “the collectors of the CDB90 data set did not leave accessible guidelines for replicating the coding of their more subjective variables.”²⁶

With such crippling limitations and lack of dependable and respected data, the CDB90 will be forgone in favor of the much more consistent and respected Correlates of War Project. The Correlates of War Project represents a collaboration of some of the largest, most reliable, and well known databases in the world. It contains hundreds of variables with millions of observations from the early nineteenth century to present day. Developed in 1963 at the University of Michigan by J. David Singer with the intent of establishing “a more accurate data set on the incidence and extent of inter-state and extra-systemic war in the post-Napoleonic period,”²⁷ this vast array of data has been regarded by many in the field as one of the most essential collections of data available. The project achieves its stated mission by providing the research community with reliable and accurate quantitative data in the field of international relations. The available data sets boast data beginning with its origins in the post-Napoleonic period, but also include data up to the present day on variables such as materials capabilities, alliances, territorial changes, militarized interstate disputes. States creator, J. David Singer “[w]e now have

²⁵ Ramsay Kristopher, “Settling it on the Field: Battlefield Events and War Termination” forthcoming *Journal of Conflict Resolution*. Available from <http://www.princeton.edu/~kramsay/private/BOW.pdf>; Internet. Accessed 04/05/2009.

²⁶ Ibid.

²⁷ Correlates of War Project. 2008. “State System Membership List, v2008.1.” Online, <http://correlatesofwar.org>.

data on alliances, material capabilities, diplomatic recognition, international organizations and their memberships, inter- and intra-state conflict, regime type, changes of government, cultural composition of states, and several forms of political rebellion.”²⁸

The reliability and validity of the data contained within the Correlates of War Project, and specifically the militarized interstate dispute data is virtually unparalleled. Singer states that:

A wide variety of source material was used in the collection of the data, including government documents, historical monographs, case studies, diplomatic histories, and newspapers. Whenever possible, coders were assigned to collect chronological data in their regional or language area of expertise. To help ensure that the militarized interstate dispute data is as historically accurate as possible, several chronologies of militarized events were independently constructed for each dispute. Upon completion, these overlapping chronologies were checked for intercoder convergence and then combined to form one chronology after all discrepancies were reconciled. Each MID was formed by aggregating incidents according to the rules laid out above. Before a militarized dispute was officially accepted, all spatial and temporal characteristics of the dispute were independently verified by two senior coders not involved with the original framing of the militarized dispute. When discrepancies in case formation or characteristics surrounding the dispute appeared, each problem was resolved through further consultation of experts and diplomatic historians. These problem cases were entered into the data set only when there was agreement among the senior coders on all questions. Once all MIDs were collected, each dispute was subjected to internal consistency checks, and a modest sized sample of the universe of cases was independently audited for historical accuracy and consistency.²⁹

To streamline the massive amounts of data available within the Correlates of War Project, as well as other key sources of conflict data, D. Scott Bennett from Pennsylvania

²⁸ Jones Daniel, Stuart Bremer, and J. David Singer, “Militarized Interstate Disputes, 1816-1992: Rationale, Coding Rules, and Empirical Patterns.” *Conflict Management and Peace Science* – Vol. 15, No. 2 (1996), PP. 163-215 [journal online]. Available from ; Accessed 03/05/2009.

²⁹ Ibid.

State University and Allan Stam of the University of Michigan have collaborated to create EUGene, software designed to reduce difficulties in constructing large international relations data sets. EUGene, or Expected Utility Generation and data management program, incorporates the Correlates of War Project, Bueno de Mesquita and Lalman's expected utility theory of war, and the Polity data from Jagers and Gurr, among others. "It accomplishes this by automating a variety of tasks necessary to integrate several data building blocks commonly used in tests of international relations theories."³⁰

In "The Capitalist Peace" Erik Gartzke looks directly to the link between economic freedom and peace (or at least, lack of conflict) between nations. In his model, Gartzke utilizes "Zeev Maoz's construction of dyadic militarized interstate disputes (DYMID) [which] is used as the dependent variable, with the standard dichotomous coding of "1" for the initial year of a MID in the dyad and "0" otherwise."³¹ This data, which is regarded as one of the primary authorities on militarized interstate disputes is contained within the Correlates of War Project. While this was an appropriate choice for his study between economic freedom and the decision to go to war, the scope of this paper is slightly different. Instead of examining the above stated link, this paper will look to see to what extent can political and economic freedom can determine military effectiveness. In order to do so, the dependent variable is inherent to the question: military effectiveness as defined by the battle outcomes. In Biddle and Long's research,

³⁰ Bennett, D. Scott, and Allan Stam. 2000. "EUGene: A Conceptual Manual." *International Interactions* 26:179-204. Website: <http://eugenesoftware.org>.

³¹ Gartzke Erik, "The Capitalist Peace." *American Journal of Political Science*, Vol. 51, No. 1 (Jan., 2007), pp. 166-191[journal online]. Published by: Midwest Political Science Association. Available from <http://www.jstor.org/stable/4122913>; Internet. Accessed: 26/04/2009.

“[b]attle outcomes offer some potentially important advantages as instruments for exploring regime type’s influence on military effectiveness. Battles also speak more directly to effectiveness in combat...”³²

Of the units of analysis stated above, this paper will apply the data from the militarized interstate disputes when constructing the EUGene based dataset. Data based on militarized interstate disputes is one of the most accepted ways to conduct quantitative analyses because it remains central to strategic international behavior, and allows an amalgamation from a multitude of different analysis in one compact quantitative study. Moreover, “the participants, start and end dates, fatality totals, and hostility levels for each dispute are identified ...and [is] disaggregated for each participant and provides additional information about the revisionist state(s), type(s) of revision sought, outcome, and method of settlement for each dispute.”³³ The data is separated into annual observations because it is the most practical option since most scholars rely on annual data both because data are widely available at this level of temporal aggregation, and because the year represents a natural political break due to budget cycles, electoral cycles, and the presence of winter that in many areas hampers military action.”³⁴ The remaining variables, all of which are independent, come directly from Erik Gartzke’s research and the source of which are directly documented in their individual explanations.

³² Biddle Stephen and Long Stephen, “Democracy and Military Effectiveness: A Deeper Look.” *The Journal of Conflict Resolution*, Vol. 48, No. 4 (Aug., 2004), pp. 525-546 [journal online]. Published by: Sage Publications, Inc. Available from <http://www.jstor.org/stable/4149807>; Internet. Accessed: 26/04/2009.

³³ Ghosn, Faten, Glenn Palmer, and Stuart Bremer. 2004. "The MID3 Data Set, 1993–2001: Procedures, Coding Rules, and Description." *Conflict Management and Peace Science* 21:133-154.

³⁴ Bennett, D. Scott, and Allan Stam. 2000. “EUGene: A Conceptual Manual.” *International Interactions* 26:179-204. Website: <http://eugenesoftware.org>.

A. Dependent Variable

In order to determine military effectiveness one must first define what determines effectiveness. In the absence of war there is peace, and from this it is nearly impossible to attribute whether there is peace simply by default or rather if a military provides such an effective deterrence that war is not a sensible option. Because of this, I will use the definition of effectiveness as set forth by Random House Dictionary. Effectiveness: adequate to accomplish a purpose; producing the intended or expected result.³⁵ To cross apply this to the scope of the study, military effectiveness will be measured in terms of concrete results. From the Correlates of War Project, and as aggregated in the EUGene Software, the dependent variable for the model will be the outcome of the dispute. This multinomial dataset utilizes the following scale:

Outcome of dispute:

- | | |
|---|---------------------------------------|
| 1 | Victory for side B or Yield by side A |
| 2 | Stalemate |
| 3 | Compromise, Released, or Unclear |
| 4 | Victory for Side A or Yield by side B |

As noted in Figure I, the occurrences of the various outcomes between the years 1950 and 1992 are displayed. As shown in the figure, there is an overwhelming probability of a stalemate between the two countries, while the probability of a win by the aggressor is quite low, comparatively. Below, Table 1 lists the individual descriptions of the specific battle outcomes.

³⁵ Random House Dictionary. Available from www.randomhouse.com.

Table 1: Outcomes Defined

Victory. A victory is defined by the favorable alteration of the status quo by one state through the use of militarized action which imposes defeat upon the opponent. It denotes the attainment of a tangible piece of territory, the significant change in an adversary's foreign policy, or the successful downfall of another state's political regime by force. A victory can be identified whenever one or more state(s) are able to secure a favorable change through the application of successful military actions which directly leads to a forced alteration of the pre-dispute status quo.

Yield. A yield is defined by the coerced submission by one state to the demands made by another state but short of any clear alteration of the status quo directly attributable to the threat, display, or use of military force. Whenever a state offers concessions that alter the status quo in exchange for not being militarily threatened or to stop further military attacks, the “losing” state has yielded to the pressure imposed by the “winning” state. As an outcome of a MID, a yield can be identified whenever one state capitulates by offering concessions which appease the demands of another state before the militarized forces of either state has secured any substantial tactical gains on the battlefield.

Stalemate. A stalemate is defined by the lack of any decisive changes in the pre-dispute status quo and is identified when the outcome does not favor either side in the dispute. Stalemates usually are produced when there was no alteration of the status quo. However, they can occur even if the status quo has changed so long as net balance results in a draw.

Compromise. A compromise is defined as a situation in which each side in the dispute agrees to give up some demands or make concessions with regard to the status quo. A compromise is identified whenever actors on both sides of a dispute agree to divide the spoils roughly equally, and hence, redefine the status quo, or agree to amicably settle their differences and accept the current status quo.

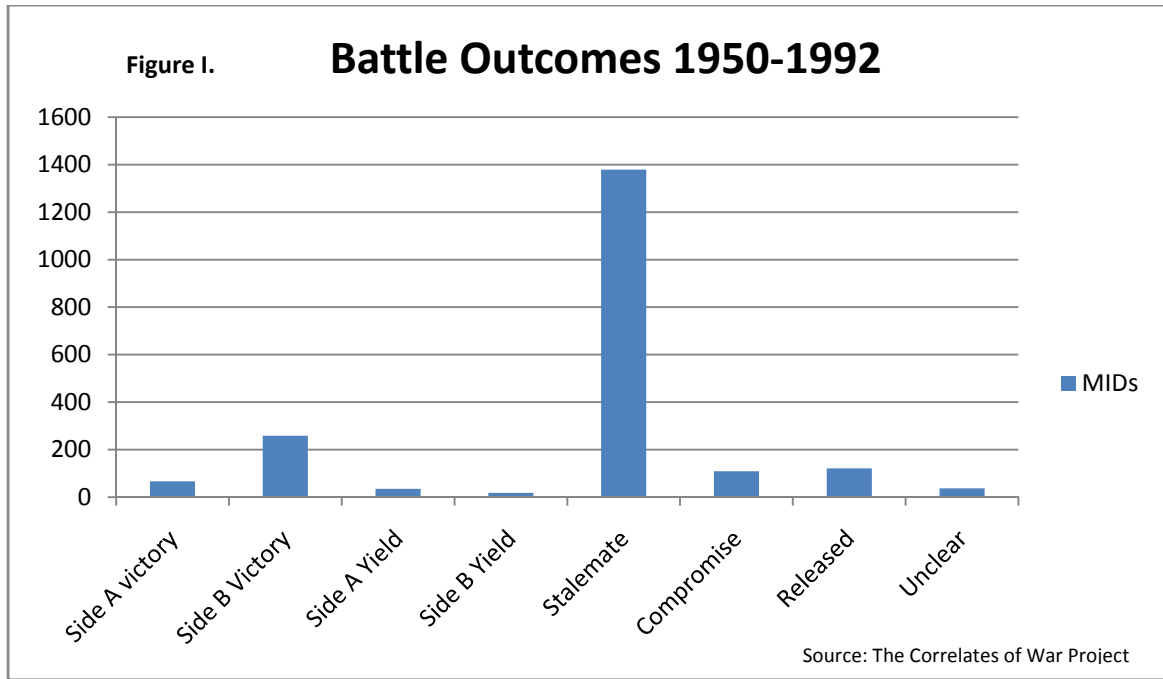
Released. A released outcome is applied only for situations in which a seizure of material or personnel defines the context of the dispute. It is identified whenever the seizure of material or personnel culminates with their release from captivity.

Unclear. An unclear outcome exists whenever the historical sources provided either conflicting interpretations or ambiguous information about post-dispute status quo.

B. Independent Variables

Democracy – Even according to the most conservative of estimates, there are still almost as many ways to measure democracy as there are people to calculate it. Because of this I will borrow heavily from Gartzke, who relies upon three separate datasets and three separate variable constructions to measure dyadic democracy. Across many studies, Gartzke's included; the epitomical measure of democracy comes from the Gurr Polity IV data (Jagers and Gurr 1995). In the Jagers and Gurr dataset, countries are assigned both a democracy and autocracy score based upon an eleven point scale, where 0= low democracy (on the democracy scale) and 0= low autocracy (on the autocracy scale) and 10 = high democracy or high autocracy.³⁶ Gartzke first prepared monadic values by combining Polity democracy (DEMOC) and autocracy (AUTO) scales as follows: $[(DEMOC_i - AUTO_i) + 10]/2$, (where $i \in [A,B]$). Adding his own interpretation, Gartzke added 10 so that all values are nonnegative and divide by 2 to yield the 0-10 range of Polity variables. Democracy (Low) and democracy (High), respectively, report the lower and higher of democracy values in the dyad. Gartzke then multiplies both results to obtain a measure for joint democracy within the dyad (jntdem), where democracy A x B is the product of monadic values. Because so much of the previous research has observed strong trends between democracy and victory, the sign of this variable is expected to be positive in the logistic regression and negative in the multinomial logit model.

³⁶ Jagers Keith, Gurr Ted, Marshall Monty, "Polity IV Project: Political Regime Characteristics and Transitions, 1800-2007." Online, <http://www.systemicpeace.org/polity/polity4.htm>. Accessed 26/04/2009.



Trade Dependency – To determine whether trade has any influence on military effectiveness independent of the abovementioned economic markets, the measure of trade interdependency is included. Using the trade data provided by Oneal and Russett and from Gleditsch (2002) in the Gartzke model, I follow his setup of the data. Gartzke follows the Oneal and Russett operationalization. Monadic values are first constructed using a ratio of bilateral trade over GDP to measure the importance of trade relative to a state's total economy. Trade dependency (depl0) denotes the lower trade dependence statistic in the dyad (Bliss and Russett 1998; Oneal and Russett 1997, 1999a, 1999b). Trade interdependence is expected to modestly increase military effectiveness, therefore giving this variable a positive sign in the logistic regression and a negative sign in the multinomial model.³⁷

³⁷ Gartzke Erik, "The Capitalist Peace." *American Journal of Political Science*, Vol. 51, No. 1 (Jan., 2007), pp. 166-191[journal online].

Economic Freedom – Utilizing data from the independent organization freetheworld³⁸, the data is measured on an 11 point index, with 0 being the most economically repressed and 10 as the most free. Although the data are only available at five year intervals, Gartzke explains how this measure of economic freedom is the most pertinent. Other, more common measures of international economic variables are capital inflow, foreign direct investment, and GDP. Gartzke, however, states that the reasons these are less reliable when trying to assess economic freedom are trifold. First, there is no widely available data for large country samples that accurately measures the flow of capital across countries. Second, there is no link that capital inflows equate with the autonomy of the state, and finally, none of the abovementioned variables can predict government intervention within the markets during a war.

C. Additional Variables

Like Gartzke, I will also include the same “control” variables that Oneal and Russett (1999) included to streamline results comparison.

Geographical Contiguity and Distance – As one might expect, distances, and subsequent increases therein, appear to deter conflict between states. The contiguity dummy is a dichotomous variable coded "1" for dyadic partners that share a land border or that are separated by less than 150 miles of water. Gartzke also includes a variable measuring the natural logarithm of the great circle distance between national capitals

Published by: Midwest Political Science Association. Available from <http://www.jstor.org/stable/4122913>; Internet. Accessed: 26/04/2009.

³⁸ The economic freedom data are available at <http://www.freetheworld.com/download>.

(with some large countries these data use the nearest major city to the appropriate border). Distance should decrease military effectiveness, in particular for smaller, less wealthy nations, therefore giving this variable a negative sign in the simple logistic regression (and positive in the multinomial model), while contiguity is expected to be positive in the logistic and negative in the logit model. Therefore increasing military effectiveness as it increases.

Major Power Status – If one looks intuitively at major power states around the world, they are more than just the wealthiest or militarily dominate countries. Major powers are the most active states in the international community; they are present in nearly all major world meetings, they are almost always the driving force behind global initiatives and even darker, more likely to initiate interstate disputes. Previously mentioned above, because poor countries are less likely to fight abroad, the obvious alternative is a major power. Major power is a dummy variable coded "1" if at least one state in a dyad is one of the five post-World War II major powers (China, France, United States, United Kingdom, and Russia) or Japan or Germany, and "0" otherwise.³⁹ Major powers should be effective in interstate conflict because of the numerous advantages that coincide with being a major power.

Military Alliances – An alliance by definition attempts to alter the international playing field by “detering aggression and by encouraging intervention.”⁴⁰ Alliances are expected to have a positive correlation with military effectiveness; that is, members of an alliance

³⁹ Gartzke Erik, “The Capitalist Peace.”

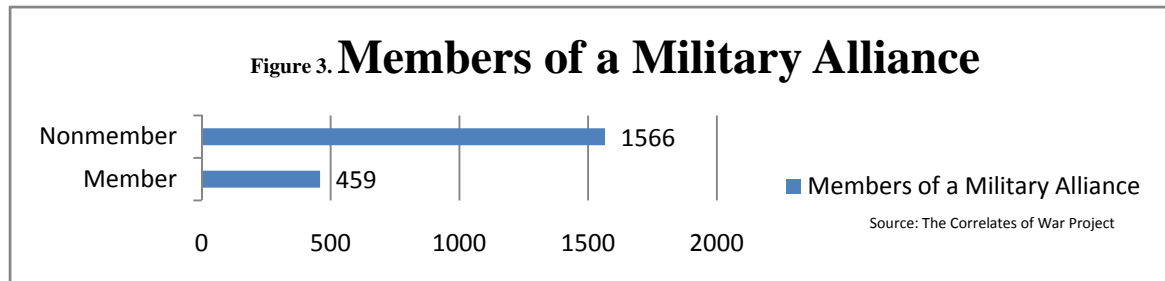
American Journal of Political Science, Vol. 51, No. 1 (Jan., 2007), pp. 166-191[journal online].

Published by: Midwest Political Science Association. Available from

<http://www.jstor.org/stable/4122913>; Internet. Accessed: 26/04/2009.

⁴⁰ Ibid.

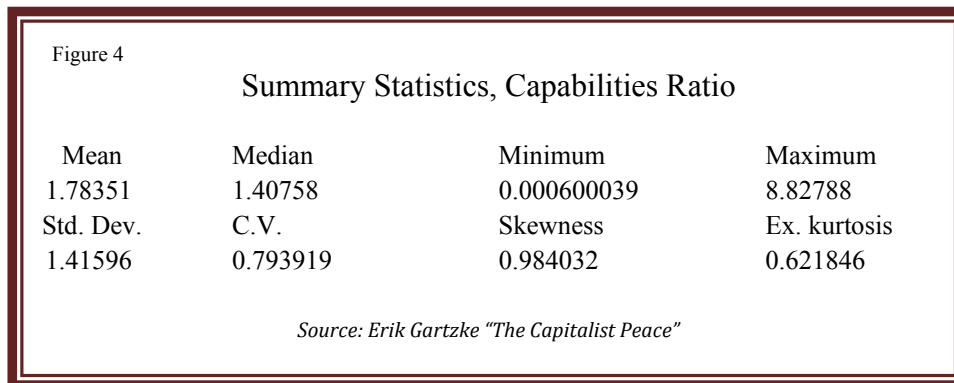
are presumed to be more effective in battle. Oneal and Russett in 1997 and 2001 included in their research a measure for alliances within a dyad. ALLIANCE is a dichotomous variable for the presence of a defense pact, neutrality pact, or entente in the dyad based on the Correlates of War (COW) Alliance Dataset (Singer and Small 1966; Small and Singer 1990).⁴¹ Members of an alliance are expected to have an increase in effectiveness.



Capabilities – From Gartzke (2007), the capability ratio equals the natural log of the ratio of the stronger state's COW capabilities index (CINC) to that of the weaker dyadic state. CINC is constructed as the weighted average of a state's share of total system population, urban population, energy consumption, iron and steel production, military personnel, and military expenditures.⁴² As the ratio increases (showing a strengthening of one nation in comparison to the other), it is expected that military effectiveness will increase. That is, the variable should be negative as the alternatives to side A victories decrease (and positive in the logistic regression).

⁴¹ Gartzke Erik, "The Capitalist Peace." *American Journal of Political Science*, Vol. 51, No. 1 (Jan., 2007), pp. 166-191[journal online]. Published by: Midwest Political Science Association. Available from <http://www.jstor.org/stable/4122913>; Internet. Accessed: 26/04/2009.

⁴² Gartzke Erik, "The Capitalist Peace." *American Journal of Political Science*, Vol. 51, No. 1 (Jan., 2007), pp. 166-191[journal online]. Published by: Midwest Political Science Association. Available from <http://www.jstor.org/stable/4122913>; Internet. Accessed: 26/04/2009.



IV. The Model

Within the aims of this research, I am trying to determine to what extent political and economic freedom have on military effectiveness. Because military effectiveness is measured in terms of side A victories, I am looking to the probability of side A victories occurring in the presence of various liberal political and economic variables. I will start first with a simpler, less complex logit model as I assume the outcomes to be in binary form. After the initial assessment of the data, I will move to the more complex and more detailed multinomial logit model. In this model, the outcomes will be put back into multinomial form.

A. Logistic Regression

In order to take an initial look at the data and the model, the distinctions between the various battle outcomes will be relaxed. Rather than 4 separate battle conclusions, that data will be grouped into a binary format; 1 for side A victories and 0 if otherwise. Because the dependent variable has assumed a binary state, a simple logit model can be run in order to take a first look at the effect of political and economic freedom on military effectiveness.

The model assumes the following form:

$$\text{logit}(p_i) = \ln\left(\frac{p_i}{1-p_i}\right) = \beta_0 + \beta_1 x_{1,i} + \dots + \beta_k x_{k,i}$$

where the logit of the battle outcome is regressed upon the independent variables as previously stated. The logistic regression is the most appropriate model in this case because I am looking at the probability of the occurrence of side A victories. The parameters will be given as unstandardized coefficients, which describe the probability in log odds units by which a side A victory will increase (with a positive coefficient) or decrease (with a negative coefficient), given a one unit change in the parameter. I will assess the significance of the results by looking at 10 percent, 5 percent, and 1 percent confidence levels.

B. Multinomial Logistic Regression

After the initial look at the data, we can recall the original assumption of a four category dependent variable. To analyze political and economic freedom on military effectiveness, the only model that correctly fits the data is a multinomial logit regression. The most appropriate choice, this model allows for a discrete dependent variable not limited to binary outcomes. Indeed, because the variable is discrete, multivariate models, which allow for continuous variables, are inappropriate, while ordered logits, whose dependent variable can be ordered in some meaningful way, are also inappropriate.

To further analyze the model, we look to an example set forth by Choong-Geun Chung, of the statistics and math department at Indiana University. The unordered multiple choice model assumes the relationship:

$$g(\text{Prob}(Y = j)) = \beta_j x \text{ for } j = 1, \dots, k + 1$$

where the response of the variable Y is measured in one of $k+1$ different categories, and β_j is the parameter vector for each j . This model is made operational by a particular choice of the distributional form of g . Although two models, logit and probit could be considered as before, the probit model is practically hard to employ. Two different logit models are commonly used; one is multinomial logit or generalized logit model and the other is conditional logit (McFadden, 1974, "Conditional Logit Analysis of Qualitative Choice Behavior," *Frontiers in Econometrics*, Zarembka ed., New York, Academic Press, pp. 105-142) or discrete choice model (this is also often referred as multinomial logit model, resulting in a conflict in terminology). The major difference between the two models is found in the characteristics of the vector x . The multinomial logit model is typically (but not necessarily) used for the data in which x variables are the characteristics of individuals, not the characteristics of the choices. The conditional logit model is typically (but not necessarily) employed in the case where x variables are the characteristics of the choices, often called attributes of the choices.⁴³

⁴³ *Models for Binary Outcomes* [database online], Choong-Geun Chung. Indiana University, 2006. Accessed 27/04/2009. Available from <http://www.indiana.edu/~statmath/stat/all/cat/printable.pdf>.

The multinomial logit model has the following form:

$$p_j = \frac{\exp(\beta_j'x)}{\sum_j \exp(\beta_j'x)} \text{ for } j = 1, \dots, k + 1$$

β_{k+1} can be set to 0 (zero vector) as a normalization and thus:

$$p_{k+1} = \frac{1}{\sum_j \exp(\beta_j'x)}$$

As a result, the j logit has the form:

$$\log \frac{p_j}{p_{k+1}} = \beta_j'x \text{ for } j = 1, \dots, k$$

The model will be run in the statistical program SAS, with the basic syntax taking the following form:

```
proc catmod;  
direct x1;  
response logits;  
model y=x1 x2;  
run;
```

where x1 is a continuous quantitative variable and x2 is a categorical variable.⁴⁴ The RESPONSE statement, or the dependent variable, specifies the functions of response probabilities used to model the response functions as a linear combination of the parameters. Simply stated, the parameter estimates represent the expected change in the dependent variable if there is a one unit change in a particular variable, given the other variables in the model are held constant. When looking at the parameter estimates, positive (+) signs represent an increase in the expected probability of the dependent

⁴⁴ *Models for Binary Outcomes* [database online], Choong-Geun Chung. Indiana University, 2006. Accessed 27/04/2009. Available from <http://www.indiana.edu/~statmath/stat/all/cat/printable.pdf>.

variable (side A victories), while negative (-) signs show a decrease in the expected probability of a side A victory relative to another outcome. The default is LOGITS (generalized logits) and its models:

$$\log \frac{p_j}{p_{k+1}} = \beta_j \text{ for } j = 1, \dots, k.$$

V. Results

As democracies become more prevalent throughout the world, the trend in international relations has been to find some sense of empirical causality between the relationship of regime type and foreign policy; in particular peace and conflict decisions. Even within the scope of various democratic governments, nations can differ greatly between advanced democracies, levels of economic freedom, intervention of the state and cultural policy. By dissecting such differences, it becomes clearer what variables are significant in understanding military effectiveness. Following this segment, the effects of variables representing economic freedom, trade markets, democracy and distance are analyzed in relation to military effectiveness and presented below.

A. Logistic Regression Results

Looking first at the binary logistical regression, we define victories by side A as 1, (in which case the null hypothesis is equal to 1) while all else is set equal to zero (the alternative hypothesis is that it is not equal to 1). Thus, an increase in “1” outcomes shows an increase in military effectiveness (side A victories), as other alternatives decrease. Table 1 reports the results of the model.

Model 1: Logit estimates using 384 observations from 1-1979

Missing or incomplete observations dropped: 1595

Dependent variable: Outcome

QML standard errors

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-statistic</i>
const	0.980724	1.86915	0.5247
Econ Freedom Ratio***	0.784438	0.258106	3.0392
Joint Democracy	-0.000811609	0.00380535	-0.2133
Log Capability Ratio***	-0.661426	0.171669	-3.8529
Log Distance	-0.342625	0.224349	-1.5272
Contiguity***	-4.49851	1.08408	-4.1496
Alliance	-0.0817627	0.61547	-0.1328
Trade Dependency***	-3558.32	1027.42	-3.4634

Mean of outcome = 0.083

Number of cases 'correctly predicted' = 362 (94.3%)

f(beta'x) at mean of independent vars = 0.000

Log-likelihood = -63.7349

Likelihood ratio test: Chi-square(7) = 92.8203 (p-value 0.000000)

Akaike information criterion (AIC) = 143.47

Schwarz Bayesian criterion (BIC) = 175.075

Hannan-Quinn criterion (HQC) = 156.006

*Significant at 10% level

**Significant at 5% level

***Significant at 1% level

From the results, several of the variables are significant. First, and perhaps most interesting, is the index of economic freedom variable, which is both positive and significant. In this model, as economic freedom increases, the probability of side A winning also increases. The remaining variables are all negative, with the trade dependency ratio, contiguity, and capabilities ratio all calculated as significant. Opposite the results from the other economic variable, as the trade dependence between two nations increase, the probability of a victory by the aggressor decreases by a massive amount. The magnitude of the trade dependency variable underscores the importance of

trade and its effect thereof in war. Also significant are the capabilities ratio and the contiguity. Both are against the grain of traditional thinking; as the military capabilities of a nation rise, it is less likely they will be successful in war. A possible explanation for this is that aggressors are not likely to pick monumentally more powerful opponents. As their own military capabilities increase, it is likely that countries will attack increasingly powerful opponents.

B. Multinomial Logistic Regression Results

By default in SAS, the referent group is set to the last value in the multinomial logistic regression model. In this analysis, the response variable is the outcome of the battle. The results for this analysis will be according the referent group “side A victory,” which, by default, is the last value of the response variables. If we define side A as our model military, we expect that increases in the log odds units of the likelihood of victories for side A show an increase in military effectiveness, while decreases in the log odds units of the likelihood of side A victories show a loss of military effectiveness.

Seven models were defined in this multinomial regression:

Model One: Side B Victory or Side A Yield relating to Side A Victory or Side B Yield
Model Two: Stalemate relating to relating to Side A Victory or Side B Yield
Model Three: Compromise, Released, or Unclear outcome relating to Side A Victory or Side B Yield

In order to determine the statistical significance of the log odds results, I will look at a chi-squared test. Within the hypothesis test, the null states that the log odds ratio is (statistically) equal to zero (showing no relationship between the parameter and the battle outcome). The alternative hypothesis states that the log odds ratio is not (statistically) equal to zero.

Basic Analysis Table two lists the results of the multivariate logit regression.

Table Two: Multinomial Logit Regression of Liberal Variables on Battle Outcomes⁴⁵

Parameter	Model Number	Change in Log Odds	Change in Odds	Chi Square	p-Value	Significance
Intercept	1	6.4448	6.29E+02	0.87	0.3505	
	2	2.4758	1.19E+01	0.22	0.6410	
	3	-7.5166	5.44E-04	1.29	0.2561	
Economic Freedom	1	-0.3224	7.24E-01	0.15	0.6952	
	2	-0.7723	4.62E-01	1.05	0.3053	
	3	0.1510	1.16	0.03	0.8529	
Log Distance	1	0.6250	1.87	0.63	0.4257	
	2	1.0070	2.74	2.49	0.0042	***
	3	1.3240	3.76	2.90	0.0884	*
Alliance	1	-1.0006	3.68E-01	0.13	0.7133	
	2	-1.5713	2.08E-01	0.40	0.5258	
	3	-2.4848	8.33E-02	0.85	0.3554	
Democracy	1	0.0157	1.02	0.45	0.5014	
	2	0.0123	1.01	0.31	0.5801	
	3	0.0147	1.01	0.40	0.5294	
Trade Dependency	1	-2997.3	0.00	5.80	0.0160	**
	2	-175.8	4.48E-77	0.35	0.5567	
	3	12.8616	3.85E+05	0.01	0.9318	
Contiguity	1	-4.8688	7.68E-03	2.78	0.0954	*
	2	0.00881	1.01	0.00	0.9971	
	3	2.1609	8.68	0.67	0.4129	
Capability Ratio	1	-1.6225	1.97E-01	5.21	0.0224	**
	2	-1.0566	3.48E-01	2.78	0.0953	*
	3	-0.3886	6.78E-01	0.37	0.5454	

*p<0.10
 **p < 0.05.
 ***p < 0.01.
 ****p < 0.001.
 n=384

⁴⁵ Additional models ran may be found in the appendix following the results and conclusions section.

C. Analysis of the Parameters

All of the parameter estimates are given in log-odds units. As it is set up, because side A victories is the default, or referent, group, all of the models are in comparison to side A victories. Therefore, when looking at the parameters within the individual models, holding all else constant, the results show whether the probability of the other outcomes (i.e. side B victories, yields, stalemates, etc.) are likely to increase or decrease based upon a one unit change in the given parameter. Thus, a negative parameter estimate shows that side A victories are likely to increase with a one unit change in the parameter, while positive parameter estimates show that side A victories are likely to decrease, while the alternative to a side A victory (like a side B victory) will increase. Because the parameter estimates of the logistic regression are in terms of the log odds units, they imply that a one unit change in that parameter results in a change in the log of the odds given by the parameter. For example, if we look at the joint democracy score of side B victories and A yields compared to side A victories, the parameter estimate (0.0157) implies that a one unit change in the joint democracy score results in a 0.0157 unit change in the log of the odds.

The log odds ratio can be calculated by raising the log e to the power of the logistic coefficient. For example, if we look to the log odds ratio above:

$$e^{0.0157} = 1.01582$$

this can be interpreted as for a one unit increase in joint democracy, the odds of a side A victory are 1.01582 times as large than a side B victory or A yield.

Democracy

As stated previously, democracy was subdivided into two categories, the lower level (demlo) and the upper level (demhi) of the dyad, which were then multiplied together (jntdem) to form one measure within the dyad. While unexpected, the positive parameter estimates are not significant at the 10 percent level for any of the models. The results show that as democracy within the dyad increases, military effectiveness (measured in side A victories) does not necessarily increase. Within the setup of the multinomial logit, results are given in comparison to the referent group. In this particular model, the referent group is side A victories, while the probability of any other outcome aside from side A victories is calculated. Surprisingly, size of the parameters are very small, and thus the results are not significant. More than this, these results are not predicated to the conclusions that Biddle and Long first came up with, going against their original conclusions. However, in subsequent models provided in the appendices which use eight battle outcomes instead of four, the results do support Biddle and Long's original analysis are able to further enhance their conclusions with the increased reliability of the data set.

Trade Markets

In the "Capitalist Peace," Gartzke stated that economic interdependence might very well be one of the only factors that can lead to a decrease in conflict initiation and an increase in military effectiveness. Indeed, as Gartzke predicted, the parameter estimates

for trade dependency are negative. As trade dependency increases, military effectiveness increases. Indeed, the data supports this by showing that in battle, the likelihood of a side B victory, side A yield, side B yield, a stalemate, compromise or released outcome all decrease in the light of side A winning. Indeed, in model one, military effectiveness increases at a statistically significant result (to the 5% level) of -2997.3 log odds units.

Contiguity and Distance

In the case of contiguity, which measures continuity of a country's rule, the results of the models are mixed. The probabilities of a side A victory do in fact increase in the first model. The conventional wisdom of measuring contiguity shows that as the territory subject to a particular nation's rule increases, the odds of that nation's success on the battlefield should increase. This should make intuitive sense because with expansion of territory comes an increase in labor, natural resources, land, and influence. Indeed, in the case of a side B victory, the results are significant, showing the probability of a side A victory is likely to improve with an increase in contiguity.

In the case of distance, one would expect that as the distance between two adversaries increases, the probability of the aggressor succeeding would decrease due primarily to the distance between the target and the home country's supply line. Indeed, the research does support this with positive parameter estimates. Side A, which is the aggressor within the given dyad, is expected to have a decrease in military effectiveness as the log distance between the two capitals increases. In the case of the second model, these results are significant at the 1% level.

Economic Freedom

Similar to the results from the earlier logit model, the parameter estimates calculated are negative in all instances except for the log odds of a released, unclear or compromised outcome compared to a side A victory. Based on the previous work by Gartzke, one would expect that as economic freedom increased, the probability of a victory by the aggressor would increase. Granted, there are several missing observations, but the initial results coincide with conventional wisdom. With economic freedom, one expects an increase in military victory because economic freedom generally leads to increases in technology, capital, higher standards of living, and increased research and development. Perhaps most unforeseen, the results are not significant within this model. Even within the expanded models, the results are not significant.

Military Alliances

Membership in a military alliance is expected to increase military effectiveness. Alliances provide increases in resources, support, human capital, and supplies necessary in war. As such, the data supports this with negative parameter estimates in every model. To be sure, the probability of a side A victory increases each time with membership in an alliance, with the highest magnitude in model three, where military effectiveness increases at 2.4848 log odds units against unclear, compromised, or released outcomes.

Military and Materials Capabilities

Military and materials capabilities, measured within this research by the widely-used Composite Index of National Capability (CINC) score, are predicted to increase

military effectiveness. After all, as one nation's resources increase, one would expect their power and might to also increase. Certainly, the data is able to support this in every instance, as every parameter estimate is negative. As capability ratios increase, military effectiveness also increases. Specifically, if we look to model one, which is statistically significant at the five percent level, military effectiveness increases by 1.6225 log odds units.

VI. Conclusions

Within the scope of research concerning peace and conflict studies, a lot of the modern effort and current work within trends toward conflict initiation. Many scholars of international relations are concerned with the initial causes of war, while the implications of conflict resolution go largely unnoticed. The aim of this work was to shed light upon what factors make some nations successful and while others fail on the battlefield. Indeed, in the simplest of scenarios with two nations involved in the battle, it would seem inevitable that in almost all cases one will be victorious. Within the data, this is generally the case as the presence of the different liberal variables increases the odds of a side A victory. However, there must be some factor, or combination of factors, that influence this outcome more than just chance.

As much of the previous research has suggested, the two largest interconnecting bonds between nations are political and economic freedom. As the literature shows, the lack of political and economic freedom are two of the main determinants that cause nations to wage war. Kant stated that nations must carefully weigh the option of fighting

with the realistic loss of a trading partner, while Gartzke also believed it was one of the only factors that could actually deter war. Indeed, it is political freedom that leads to oppression and slavery in one nation, while another enjoys equal rights, freedom of religion, and voting privileges. Economic freedom determines which countries are rich with resources and are able to provide their citizens with higher standards of living, while in others, large percentages of GDP are never seen by the citizens. Political and economic freedoms serve as the springboard for which nearly all conflict initiation is derived. If the previous data can show these as major catalysts for initiation, why should the possibility for resolution not also be explored?

The data and consequential results within this research were in some instances able to enhance the conventional wisdom concerning the link between war and political and economic freedom. Indeed, while the results were not significant in every instance, the basic interpretation are able to show what Biddle and Long had predicted, but with a much more intricate and reliable dataset. In comparison to Gartzke, this research shows that economic freedom is not the sole factor determining conflict initiation or resolution.

Categorically, the data presented within this research are able to show, to some extent, that these same factors can affect conflict resolution. The traditional, expected previous projections of the data from past research were often based on little more than intuitive reasoning, whereas this work was able to statistically provide concrete validation, often times in favor of the traditional expectations. The liberal variables presented within this work are derived from political and economic freedom, and then were individually regressed upon various military outcomes.

To large extent, political and economic freedom, measured in terms of variables such as trade dependency, democracy, indexes of regime type and financial freedom are able to correctly predict military effectiveness. To some degree, this does not come as a surprise, but rather as validation to traditional thought; For many years, students of international relations have expected that at least one of these variables could increase military effectiveness.

Political freedom, in essence democracy, is more than just a type of government; it serves as a basket of traits encompassing the best and the most practiced ideas of the citizens, and history at large. It combines competition of the citizens to provide for enhanced decision making, increased knowledge, and calculated conclusions.

Similarly, economic freedom and trade creates interdependence between nations that makes conflict less likely. Economically dependent nations are more likely to have needed resources, enhanced economic markets, and increased standards of living. All of which lead nations to amass greater amounts of wealth and power.

With both established logic and data to support this hypothesis, it becomes clear that political and economic freedom, to large extent, can increase military effectiveness as nations are able to learn and gather information. This research can provide a basis for fine-tuning of military effectiveness. Research looking specifically at the intricacies of democratic regimes can in the future possibly determine which decisions are more paramount than others. Research in international trade can look to see if it matters which goods are traded or if trade simply needs to exist. This research presents students of international relations to now delve deeper and examine the minute details of how future warfare can be determined.

Appendix 1.

Model 3. Multinomial Logit Regression of Liberal Variables on Battle Outcomes

Parameter	Model	Change in Log				Significance
		Odds	Chi Square	p-Value		
Intercept	1	10.5323	15.13	0.0001	****	
	2	4.1555	1.75	0.1864		
	3	1.3999	0.16	0.6893		
	4	9.7708	13.70	0.0002	****	
	5	7.9781	8.35	0.0039	***	
	6	4.1029	2.16	0.1416		
	7	6.6931	4.68	0.0306	**	
Jnt. Democracy	1	-0.00589	1.92	0.1657		
	2	0.00819	1.78	0.1821		
	3	-0.00914	1.93	0.1644		
	4	-0.00548	1.84	0.1747		
	5	-0.00594	1.74	0.1866		
	6	-0.00444	1.04	0.3078		
	7	0.00102	0.04	0.8446		
Trade Dependency	1	-2597.8	18.32	0.0001	****	
	2	-474.8	1.73	0.1881		
	3	72.5694	0.28	0.5986		
	4	16.8949	0.02	0.8941		
	5	-188.4	1.09	0.2961		
	6	108.3	0.72	0.3963		
	7	-681.2	2.18	0.1400		
Contiguity	1	-2.3069	12.59	0.0004	****	
	2	0.4286	0.23	0.6319		
	3	1.9141	2.29	0.1302		
	4	-0.4327	0.51	0.4769		
	5	-0.6972	1.06	0.3023		
	6	-0.2618	0.16	0.6883		
	7	-2.1398	7.33	0.0068	***	
Log Distance	1	-0.6937	4.63	0.0314	**	
	2	-0.2582	0.47	0.4932		
	3	-0.224	0.31	0.5771		
	4	-0.5437	3.01	0.0825	*	
	5	-0.7163	4.74	0.0295	**	
	6	-0.1812	0.30	0.5852		
	7	-0.5531	2.22	.1365		
Alliance	1	-1.5227	6.56	0.0105	**	
	2	0.8126	1.31	0.2517		
	3	-0.4294	0.27	0.6037		
	4	-0.9050	2.92	0.0877	*	
	5	-0.0395	0.00	0.9458		
	6	-0.9882	2.83	0.0925	*	
	7	0.4197	0.40	0.5251		
Log Capability	1	-0.6420	18.02	0.0001	****	
	2	-1.1859	17.62	0.0001	****	
	3	-0.7440	7.03	0.0080	***	
	4	-0.5526	15.52	0.0001	****	
	5	-0.3904	6.07	0.0137	**	
	6	-0.2724	3.20	0.0738	*	
	7	-0.4608	7.04	0.0080	***	

*p<0.10
**p < 0.05.

***p<0.01
****p<0.001

Appendix 2: Correlation Coefficients

Variable	Outcome	Economic Freedom	Trade Dependency	Joint Democracy	Log Distance	Contiguity	Alliance	Log Capability
Outcome	1.0000	0.0594	0.0714	0.0747	-0.0646	0.1226	0.0953	0.1455
Economic Freedom	0.0594	1.0000	0.2360	0.1717	0.0831	-0.1202	-0.0503	0.2352
Trade Dependency	0.0714	0.2360	1.0000	0.0636	-0.2838	0.0831	0.0915	-0.0712
Joint Democracy	0.0747	0.1717	0.0636	1.0000	-0.2838	0.2776	0.3587	-0.0057
Log Distance	-0.0646	0.0831	-0.0688	-0.2838	1.0000	-0.5981	-0.2343	0.2252
Contiguity	0.1226	-0.1202	0.0831	0.2776	-0.5981	1.0000	0.2274	-0.1575
Alliance	0.0953	-0.0503	0.0915	0.3587	-0.2343	0.2274	1.0000	-0.0645
Log Capability Ratio	0.1455	0.2352	-0.0712	-0.0057	0.2252	-0.1575	-0.0645	1.0000

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