THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF POLITICAL SCIENCE

TRADE, DEVELOPMENT, AND INTERSTATE CONFLICT

DEBORAH LEIGH CIBOS
Spring 2012

A thesis
submitted in partial fulfillment
of the requirements
for baccalaureate degrees
in Political Science and Economics
with honors in Political Science

Reviewed and approved* by the following:

Glenn Palmer
Professor of Political Science
Thesis Supervisor

Michael Berkman
Professor of Political Science
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

ABSTRACT

While the effects of trade on interstate conflict have been a source of constant debate, the interconnectivity of modern world markets is rarely measured in the context of economic development. The literature claims that economic development on the national level creates a trade-off between the opportunity and willingness to engage in conflict; while opportunity increases with development, a state becomes less willing to engage in conflict as prosperity increases. This study utilizes development's non-linear relationship as a foundation for interaction. Through a logistical regression analysis of politically relevant, directed dyads from 1950-2000, I test the hypothesis that the interaction of economic development and bilateral trade reduces both the likelihood of conflict and the likelihood of an "intense" conflict involving fatalities. The results confirm that the interaction term is in fact negative and significant, despite the fact that trade has a positive effect on conflict. This study not only isolates the dynamics of the post-World War II era, but it qualifies the liberal, open-market paradigm within the framework of economic development. The findings of this study indicate that trade is most effective as a conflict-deterring policy at high levels of economic development.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

Acknowledgements

I would like to formally thank my thesis adviser and professor, Dr. Glenn Palmer, for his patience and guidance throughout this entire process. Additionally, I would like to thank Dr. Michael Berkman and Dr. Gretchen Casper for their insight into the world of Political Science research and writing. I would also like to thank Daehee Bak, graduate student in Political Science, who assisted me in creating and refining graphs for my analysis.

Section I: Introduction

Peace is preferable to conflict: this is a statement rarely contested. Yet on the systemic level, states conflict, and despite centuries of scholarly attention on reliable avenues to mutual cohabitation in the Westphalian world, the ultimate destination of peace remains elusive. Two of the most cited routes toward the reduction of interstate conflict — economic development and trade-based interdependence — have become even more salient in a rapidly globalizing realm of industrialization, expansion, and commercialization. The sparkle of economic superstars like China, who in 2010 surpassed Japan as the world's second largest economy (Wu 2010), depict a political environment of increasing opportunity and interaction. For many, the spread of capitalism and free-market mantras signals the end of conflict and the promise of a more peaceful world. At the same time, however, the interference of trade and economic development can illuminate inequalities, underline ethnic differences, and fuel power struggles that incite conflict. Within states as diverse as Myanmar, Kenya, and Bolivia, open markets serve to promote the interests of elite minorities at the expense of the general population, churning currents of tension and waves of instability (Chua 2003). Not only does trade redefine balances within countries, but also *between* them; it has a dual capacity to "lift all boats" in absolute terms, but also to buoy dissatisfaction in relative terms. The nature of trade is complex indeed.

States may not be able to exercise complete control over an anarchic and unpredictable international system, but they can navigate and influence bilateral relationships to maximize welfare. Specifically, trade, as a foreign policy tool, may be used to achieve goals that seek either to *maintain* or *change* aspects of the status quo (Morgan and Palmer 2003). Among satisfied states, trade may preserve and build alliances; among states who are dissatisfied, it may create leverage or stir conflict. It is through the recognition of foreign policy incentives that the

1

hazy whir of trade comes into sharper focus, that it becomes possible to distinguish how it may mitigate, or even incite conflict. Questions inherently arise. How can trade explain the interdependent dynamics between states? Should foreign policy makers rely on a "liberal peace" to bypass conflict and improve international relations?

While it may be impossible to uncover a clear-cut conduit to peace, this study examines the character of trade through an economic perspective to create a more complete framework and to elucidate the utility of future dyadic interactions. I propose an interactive, quantitative model that hinges on varying levels of economic development to demonstrate how capability competes with status quo satisfaction to shape incentives. Fashioning a standard logistical regression to model GDP, trade, and conflict data, I examine directed dyads in the period from 1950 to 2000 on a global scale. While I expect both development and trade to have pacifying characteristics as a consequence of increasing satisfaction (both nationally and internationally), I expect the interaction to be most marked at high levels of economic development.

Section II: Literature Review

Within conflict research, extant scholarship on the liberal tenets of economic prosperity and interdependence is not only frequently archaic, but notoriously divergent. While economic development is generally linked with peace in the modern era, the true nature of trade has proved elusive. Through the illumination of existing research in the overlapping, but disconnected realms of development, trade, and interstate conflict, the need for a new, more integrated discussion will become apparent.

The Effects of Economic Development

Although the effects of interstate trade are shrouded in controversy, some consensus has been reached on the interpretation of economic development. Economic development, the process of accumulating wealth, is a continuous feature of the international system, intricately woven into the conflict literature. Baldwin, Martin, and Ottaviano (2001) chart a general trend in international growth triggered by the Industrial Revolution in Britain during the eighteenth century. In a general sense, this rapid development, though detrimentally associated with income divergence and inequality within and between various regions of the world, has been beneficially correlated with falling transportation and trade costs (Baldwin et al. 2001). Development has warped time and space, permitting faster and more extensive interactions. Wealth increases the potential to expand military capabilities, but theorists such as Hegre (2000), Mueller (1989), and Rosecrance (1986) contend that development unleashes a new range of tactics for settling differences and expanding national welfare short of conflict. Thus, when it comes to development, logic dictates a dichotomy between an increasing capacity and a decreasing affinity for conflict as a foreign policy tool.

Figure 2.1: Basic Model of Opportunity and Willingness Depicted by Boehmer and Sobek
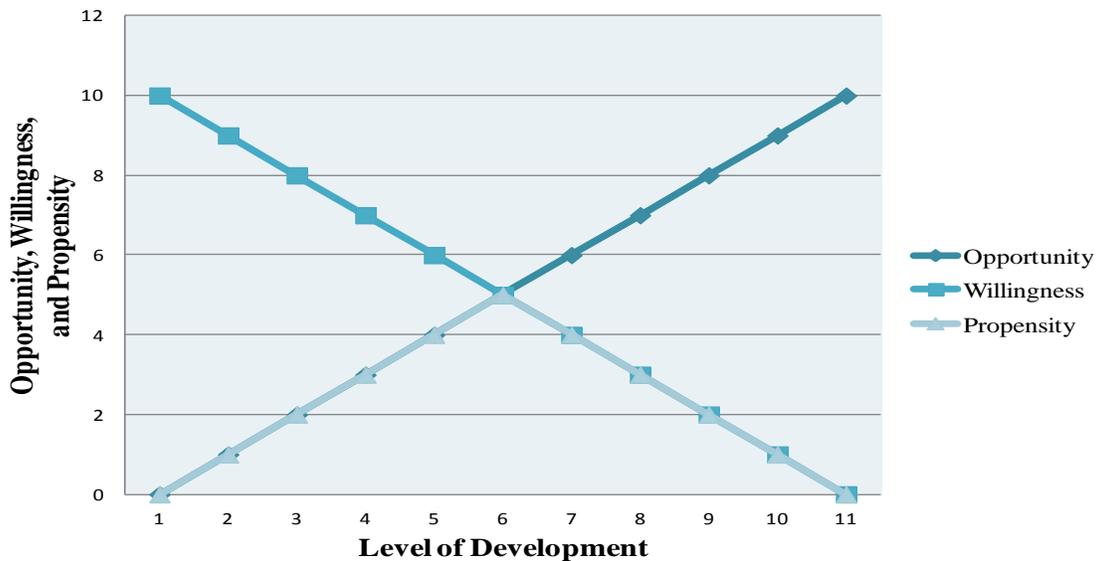
This complex relationship has been explored both theoretically and empirically through the related concepts of "opportunity" and "willingness." While opportunity signals "possibility," willingness indicates "choice," and together they manufacture an international framework of structure and decision (Most and Starr 1989). Moving from the abstract to the concrete, Clark and Regan (2003) claim that these concepts can be measured empirically by quantifying opportunity in terms of indicators such as CINC capabilities, regime type, and dyadic distance; willingness through status quo satisfaction, relative capability, and economic interdependence. Boehmer and Sobek (2005) argue that this dual construction is useful for understanding how economic development affects conflict. They posit that opportunity's positive effect on conflict intersects willingness's negative effect to explain a nonlinear relationship. Figure 2.1, which visually demonstrates the idea that conflict is most likely during "violent adolescence," or intermediate levels of development, confirms this nonlinear relationship. This basic understanding of monadic behavior is essential for developing a model capable of overlaying the

interactive effects of trade at the dyadic level.

The Effects of Trade

For centuries, scholars have sought to determine the pacifying or conflict-exacerbating

effects of interstate trade.   Skeptics have kindled a fire of debate, but the liberal paradigm has

dominated the Western understanding of trade's role in the international system. Barbieri (1996)

identifies four schools of thought in the trade literature:

>   *h1*: Trade tends to reduce conflict.
>   *h2*: Trade tends to increase conflict when the relationship is asymmetrical.
>   *h3*: Trade tends to increase conflict.
>   *h4*: Trade has no relevant effect on interstate conflict.

The Majority Opinion: Peace through Trade

The first hypothesis coincides with the liberal model, the notion that "interstate linkages

[improve] communication, reduce misunderstanding, and foster cultural and institutional

mechanisms capable of mediating conflicts that do arise" (Barbieri 1996, 30). Though liberal

scholars propose different theories on the exact function of trade, their conclusions converge on

the prospect of peace. Reed (2003), for example, claims that trade reduces "noisy bargaining"

through increased information symmetry and the reduction of uncertainty.   Maoz (2009), on the

other hand, utilizes a "Social Network Analytic" method to illustrate the benefits of strategic and

economic interdependence. All liberal theorists, fond of classical interpretation, look to Smith

([1776] 1910), and Ricardo (1821), who convert self-interest into altruism in the form of

comparative advantages that benefit trading partners. Because trade is tied to a welfare gain, the

loss of trade is considered a welfare loss that affects the terms-of-trade line and a cost that must

be calculated into rational decision-making (Polachek 1980). In other words, conflict may be

avoided to preserve a beneficial, but tenuous partnership between states. According to Crescenzi

(2003), trade elevates "economic exit" to a viable threat capable of mitigating many conflicts. Rosecrance (1986), in addition, claims that military mechanisms are an increasingly inefficient means for acquiring power and resources as compared with trade and economic interaction. For the most part, empirical evidence — including the frequently cited work of Russet and Oneal (2001) on the virtuous, Kantian triangle of democracy, international organizations, and economic interdependence — bolsters the liberal notion that trade has a negative, deterrent effect on conflict.

The Dissenting Opinion: Uncovering a Myth?

Nevertheless, a barrage of opposition continues to plague the null hypothesis of an inherent liberal peace between trading states. While inconclusive and muddled, competing works point to flaws in the liberal patchwork, holes in the tapestry of peace-promoting trade theory. The pool of dissent can be distilled along hypotheses 2, 3, and 4 from above. Specifically, several scholars claim that peace is only a result of *symmetrical* trade, that trade actually *incites* conflict, or that the relationship between trade and conflict is inconsequential. These ideas will be presented to expose weaknesses in the liberal design, and ultimately, to construct a theory that acknowledges the limits of interdependence.

It is virtually impossible to discredit trade in light of modern international relations, but it is valuable to consider how it may be qualified. Abundant research, empirical evidence, and heightened focus on the subject of trade interact to dismantle the platform of hypothesis 4: the notion that trade is completely irrelevant to conflict. As Barbieri boldly claims, "Clearly, the time has come to elevate economic relationships from their traditional secondary status to center stage in the study of international relations" (1996, 44). The role that trade plays, however, is much less clear. The charge against traditional liberal thought (ignited by Lenin [1939] in the

early twentieth century) is led by Barbieri herself, whose findings indicate that high levels of

interdependence actually *increase* the likelihood of interstate conflict. Her study examines dyads

in the period between 1870 and 1938 and highlights the concepts of saliency and balance in

trading relationships. Still, critics of Barbieri's work are numerous and declare inaccuracy and

inadequacy in her measures which fail to account for correlated features such as power (Gartzke

and Li 2003; Xiang et al. 2007). Rather than predicting a direct positive relationship between

trade and conflict, most scholars thread exceptions and conditions into the literature, assuming a

stance similar to hypothesis 2. They argue that the symmetry of trade matters (Hegre 2004); the

composition of trade matters (Dorussen 2006); the condition of trade (i.e.: free trade) matters

(McDonald 2004); finally, the development of trade matters (Hegre 2000). This final

proposition, the idea that trade affects conflict differently at different levels of economic

development, relates back to the opportunity-willingness framework and is supported by

quantitative results. Hegre, who observes fatal conflicts between 1950 and1992, finds that

trade's pacifying effects are most visible among highly developed dyads; he suggests, "A certain

level of development may even be a prerequisite for the liberal peace to work" (9). Mousseau

(2000) identifies a similar phenomenon in which the democratic peace is necessitated by a

degree of economic development to achieve statistical significance. Thus, the literature's

inability to pinpoint the role of trade in interstate relations may stem from its duplicitous nature,

its ability to morph between friend and foe given economic structural constraints. The effects of

trade, therefore, must be differentiated.

A New Discussion

The inconclusiveness of the literature points to a level of complexity that transcends one-

dimensional analysis. It is unrealistic, and not very useful, to expect all states to possess the

same types of incentives. The motives that drive poor countries like Kenya, intermediate

countries like Chile, or rich countries like the United States to the point of conflict are drastically

different. States become more capable of initiating conflict, but less willing as they develop

economically (Boehmer and Sobek 2005). Therefore, it is intuitive that the utility of trade

changes as well. Hegre's study takes this complication into account through an interactive

model of development and interstate trade, proposing that the utility of trade and the costs of

breaking alliances rise with development. However, the tenets of Hegre's work, as well as

similar research, can be expanded and refined. Due to data limitations, his sample only includes

dyads up until 1992; this constraint isolates his findings to the Cold War era and excludes the

globalization surge of the 1990s. Furthermore, he bases his model on the notion of a "weak link"

hypothesis in which the lower developed state indicates the wealth of the dyad. This design

structure disguises the unique condition of the individual state actor and ignores the valuable

national considerations of opportunity and willingness.   Thus, existing literature has located

critical pieces in an evolving political and economic puzzle, yet mystery and doubt remain.

Section III: An Interactive Theory

While no model is perfectly capable of explaining conflict, the purpose of this research design is to create some degree of order (Bueno de Mesquita 1981, 10) out of an entropic entanglement of economic development and interstate trade. For the purposes of constructing a general theory, it is assumed that states are rational unitary actors abiding by standard economic theory: states make decisions to maximize their own social welfare (Polachek 1980, 60). Though simplistic, this assumption is fundamental in framing the factors that affect conflict-seeking behavior, and more specifically, the motives of the state actor. Furthermore, this conception of the state is central in constructing a model adept to understanding the past, interpreting the present, and conjecturing future interstate interaction.

The notions of opportunity and willingness, two facets that have been expressed theoretically and measured empirically, will be used to guide a model of conflict propensity. Whereas opportunity takes into account the capability of a state in terms of factors such as proximity and power, willingness is indicated by more soft-power (Nye 1990) features such as regime type and status quo dissatisfaction (Clark 2003). In terms of economic development and its effect on interstate conflict, Boehmer and Sobek theorize that adolescent states possess a dangerous combination of both opportunity and willingness; their results confirm a non-linear, inverted-U relationship in which conflict propensity is lowest at very low and very high levels of development. However, the authors, in looking at the monadic level of development, are unable to capture the dual concept of interstate trade.

I make several advancements to the basic opportunity and willingness model. First, I encourage the expansion of case selection to include the post-Cold War era. This concentration targets the era most affected by widespread economic development and international trading

channels and most relevant to modern policy formation. Second, I enforce the fact that conflicts are dyadic in nature, that the decision to conflict involves the expected utility calculations of an actor in relation to a target. Thus, the directed dyad is an appropriate unit of analysis not only for capturing the actor's decision to initiate conflict, but also its unique relationship with the target. Finally, I claim that trade, measured bilaterally in a dyad, is an integral aspect of a state's opportunity and willingness calculation. Expanding Boehmer and Sobek's theory, I predict that the conflict propensity of states will not only vary at different levels of development, but that there is a unique interaction between trade and development that has a resulting effect on conflict propensity.

Figure 3.1 illustrates an interactive model of economic development and bilateral trade. While this model will not be replicated through the research, it provides a visual representation

Figure 3.1: Interactive Model of Opportunity and Willingness
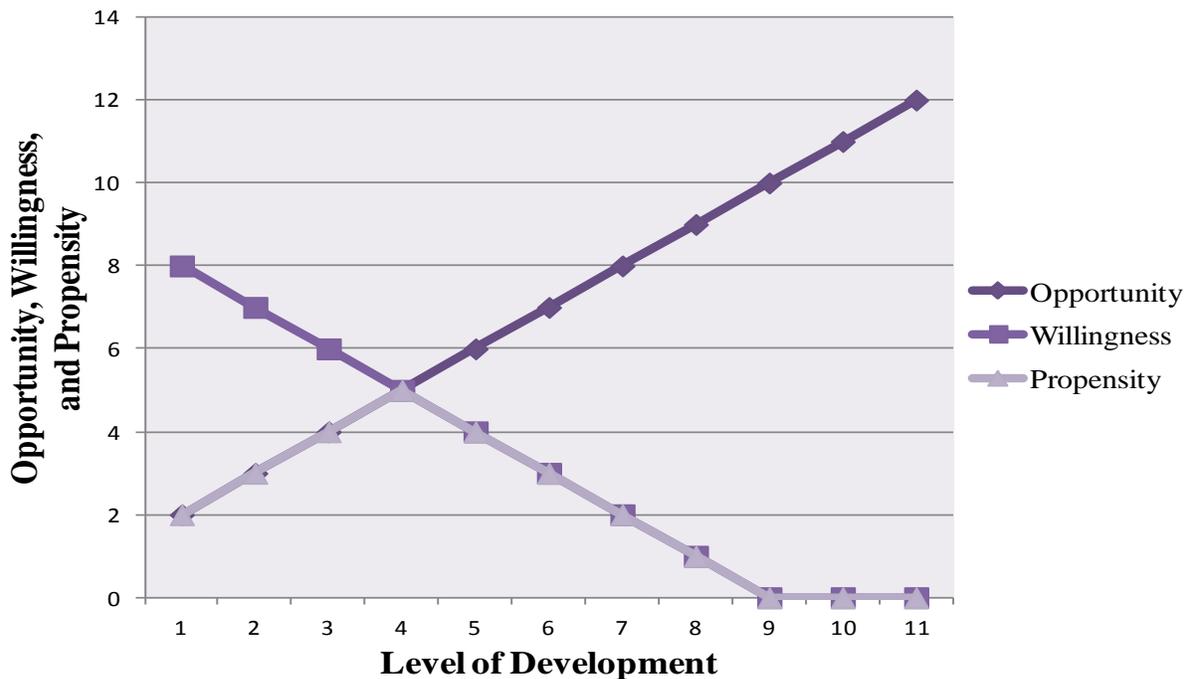
of the variables and processes at work. Trade will operate on the opportunity curve by shifting it

upward. This rationale is synonymous with Clark and Regan's (2003) opportunity measure of

dyadic distance which is inversely related to conflict (i.e.: greater distance = lower likelihood of

conflict). I expect trade to make the world smaller through more frequent and closer interaction

— thus opportunity increases. As Bearce and Fisher conclude, "economic geography includes

not only the physical distance between two states but also the technology and economic

infrastructure between them" (2002, 391). However, I expect trade's effect on willingness to be

even greater. This is manifested in a downward shift of the willingness curve, resulting in

minimal propensity at high levels of economic development. In a positive sum ideal consistent

with liberal thought, I posit that trade accrues mainly positive benefits through the reduction of

"noisy bargaining" (Reed 2003) and shared norms of contract which will be most powerful

among developed nations (Mousseau 2000). Furthermore, I claim that the decision to trade

stems from a desire to build, rather than break down relations. Simplified propensities have been

estimated in Figure 3.2.

Figure 3.2: Simplified Conflict Expectations

	Level of Economic Development		
Level of Trade	*Low*	*Medium*	*High*
High	Medium	High	Very Low
Medium	Medium	High	Low
Low	Very Low	Medium	Low

Note: Provides basis for Figure 5.2 in Section V

Hypotheses

Having placed the concept of trade within the opportunity-willingness framework, it is now possible to formulate testable hypotheses. Defining economic development in terms of income rather than capability, I link my theory to a simple measure of national welfare easily translated into status quo satisfaction; I presume that countries with higher standards of living will have greater status quo satisfaction and will be less likely to initiate conflict. With Boehmer and Sobek's nonlinear findings in consideration, I propose that this definition will lead to a development-conflict relationship that is negative in net terms. I connect this with a negative trade-conflict relationship which I expect to be most visible as development increases. These expectations produce the following:

Model 1

I. H_a: Greater economic development reduces the likelihood that a state will initiate conflict.

II. H_b: Greater economic interdependence reduces the likelihood that a state will initiate conflict.

III. H_c: Greater economic development and interdependence interact to reduce the likelihood that a state will initiate conflict. Higher bilateral trade will have the greatest effect on reducing conflict at high levels of economic development.

While the main purpose of this study is the examination of conflict initiation, I include a model which incorporates the degree of conflict to make the theory more robust. In order to avoid bias in potentially "over-reported" low-level disputes (Hegre 2000), I also study the likelihood that a state initiates a conflict that leads to fatalities. The rationale that accompanies the first model produces nearly identical hypotheses in the second model.

Model 2

I. H_a: Greater economic development reduces the likelihood that a state will initiate a conflict that leads to fatalities.

II. H_b: Greater economic interdependence reduces the likelihood that a state will initiate a conflict that leads to fatalities.

III. H_c: Greater economic development and interdependence interact to reduce the likelihood that a state will initiate a conflict that leads to fatalities. Higher bilateral trade will have the greatest effect on reducing intense conflicts at high levels of economic development.

Section IV: Methods

This research design emphasizes the interpretation and analysis of extant quantitative data to highlight empirical relationships between economic development, bilateral trade, and interstate conflict. The cases have been selected carefully on the basis of both relevance and year. Specifically, the theory is evaluated on the basis of politically relevant, directed dyads from 1950 to 2000.   The decision to utilize only politically relevant dyads — those involving contiguous states or at least one major power — is predicated on the notion that these states possess the opportunity to engage in conflict. Lemke finds that the rationale for using politically relevant dyads as a case selection strategy outweighs the insignificant error and bias associated with sampling (Lemke 2000). Furthermore, the decision to survey cases exclusively in the post-World War II timeframe is both an acknowledgement of the increased availability of trade and development data and a conscious effort to assess the climate of the modern era. The nearly 110,000 cases pulled according to these selection criteria are evaluated using a standard logistical regression in Stata.

Dependent Variables

The dependent variables of *Conflict Initiation* and *Conflict Intensity* are measured through the Militarized Interstate Dispute (MID) dataset developed by the Correlates of War project. One of the most widely respected and extensive conflict sources, MID data codes all threats, displays, and uses of military force as disputes. *Conflict Initiation* is dichotomous, where a "1" represents the initiation of at least one MID and a "0" the absence of a MID in a given dyad-year. *Conflict Initiation*, therefore, is unable to capture the seriousness of a dispute; for example, on the initiation level there is no difference between a border violation and the

Figure 4.1: Levels of Conflict

commencement of nuclear warfare.   For this reason, *Conflict Intensity* has been included in the

model to gauge the level of conflict through an assessment of military fatalities. It is also

dichotomous. In this case, a "1" indicates that a MID initiated by State A involves one or more

military fatalities (intense), and a "0" represents either the absence of conflict or the presence of

a conflict but absence of military fatalities (non-intense). Though a simple metric, this measure

is transparent and reliable, and it deepens the relevance of the theory. This model is not only

capable of determining whether or not trade and development dampen conflict, but also whether

or not they reduce the likelihood of bloody, costly conflicts. The inclusion of *Conflict Intensity*,

therefore, increases the model's robustness. The relationship between the dependent variables is

depicted above in Figure 4.1.

Independent Variables

The theory includes three independent variables: *Economic Development*, *Bilateral Trade

Volume*, and the interaction of economic development and trade flow, termed *Developed Trade*.

These variables are operationalized according to Gleditsch's Expanded GDP and Trade Data.

Economic Development is measured as the natural log of real GDP per capita: State A's total

GDP (in constant dollars relative to 1996) divided by its population. This standardized indicator

is both parsimonious and valid, straightforwardly targeting national income level rather than

production level. Economic development is viewed more as an indication of economic maturity

and welfare than economic capacity; for a state to have a high level of development, therefore, its

citizens must enjoy a high quality of life (high income). The second variable, *Bilateral Trade*

Volume, indicates the volume of trade between State A and State B in millions of constant U.S.

dollars. Unlike Russet and Oneal's dependency variable[1], *Bilateral Trade Volume* measures the

level of trade rather than economic significance. Because the variable *Economic Development*

already takes into account the economic fortitude of State A, volume is an appropriate measure

for exposing the importance of trade in the dyad and creating a foundation for interaction that

does not place extra attention on development. In a model that excluded economic development,

however, it is likely that dependency would more accurately reflect the importance of the trading

relationship. The interaction of development and trade, which examines the impact of trade at

different levels of development, is the product of *Economic Development* and *Bilateral Trade*

Volume. This interaction term, *Developed Trade*, represents the most important contribution of

the theory and assumes that the interaction of development and trade is not simply additive.

Thus, the interaction term indicates that the influence of trade varies at different levels of

economic development.

Design Specifications

This design combines several control variables within a logical analysis framework to

bolster credibility in light of previous findings. The following control variables, all of which are

associated with conflict, have been included to isolate the effects of the independent variables on

---

[1] Russet and Oneal calculate trade dependency as a state's total imports and exports in a given dyad divided by its GDP.

conflict: *Target Development, Contiguity, Relative Capability,* and *Joint Democracy.* First, the

continuous variable *Target Development,* the natural log of State B's real GDP per capita, is

added to the regression. While the economic development of State A is of primary concern to

the theory, the economic development of the target state nonetheless plays a role in the selection

process. The second variable, *Contiguity*, considers the fact that proximity creates increased

interaction and opportunity for conflict. Thus, contiguity has been positively correlated with

conflict. A dyad is coded as contiguous if it shares land borders or is separated by less than 150

miles of water. *Relative Capability*, measures the capability of State A relative to State B using

the CINC scoring metric[2] developed by the Correlates of War. The value of *Relative Capability*

is continuous from "0" to "1" and is calculated by dividing the capability of State A by the sum

of State A and State B's capabilities. Finally, the dichotomous variable *Joint Democracy*

acknowledges the fact that democracies rarely go to war with each other. A score of "1"

indicates that both members of the dyad have democracy scores greater than "7", while a "0"

represents a dyad in which one or both members have scores less than or equal to "6."

Figure 4.2: Logistical Regression Notation

> ***Conflict Initiation*** $= \beta_0 + \beta_1 Economic\ Development + \beta_2 Bilateral\ Trade\ Volume + \beta_3 Developed\ Trade + \beta_4 Target\ Development + \beta_5 Contiguity + \beta_6 Relative\ Capability + \beta_7 Joint\ Democracy + e$
>
> ***Conflict Intensity*** $= \beta_0 + \beta_1 Economic\ Development + \beta_2 Bilateral\ Trade\ Volume + \beta_3 Developed\ Trade + \beta_4 Target\ Development + \beta_5 Contiguity + \beta_6 Relative\ Capability + \beta_7 Joint\ Democracy + e$

EUGene (Expected Utility Generator) software is utilized to produce a directed dyad-year

dataset, containing dependent and control variable information, from 1950 to 2000. This

---

[2] Components: energy consumption, iron/steel production, military expenditures and personnel, urban and total populations

foundation is then merged with Gleditsch's data to create one centralized data file. The variables

are tested using a standard logistical equation in Stata that matches the notation in Figure 4.2.

Support for the theory is gauged according to the direction of the coefficient terms and the

significance of the p-values. If the hypotheses are correct, all coefficients for the independent

variables *Economic Development*, *Bilateral Trade Volume,* and *Developed Trade* will be

negative to indicate a pacific effect on dyadic behavior. P-values under 0.10 are considered

borderline, those under 0.05 significant, and those under 0.01 highly significant.

Section V: Presentation of Results

The results for Models 1 will be presented first through data analysis and second through graphical analysis. Next, the results of Model 2 will be assessed in order to verify the robustness of the theory. For the most part, the hypotheses are proven correct by the model, with the exception of the coefficient on *Bilateral Trade Volume*.

Data Analysis: Model 1

**Table 5.1: Logistical Regression of the Effects of Development and Trade on MID Initiation (1950-2000)**

Variable	*Model 1*
Economic Development: Logged Development of State A	-.16***(.03)
Bilateral Trade Volume	1.3e-4***(.00)
Developed Trade	-1.0e-5***(.00)
Target Development: Logged Development of State B	.05(.03)
Contiguity	2.2***(.07)
Relative Capability: State A to State B	.54***(.08)
Joint Democracy	-.82***(.13)
Constant	-4.9***(.27)
N	109508
χ^2	1640
Log Likelihood	-6285
p<.10, **p<.05,p<.01**	

Sources: Gleditsch Expanded Trade and GDP Dataset, MID4 Dataset, EUGene

Table 5.1 illustrates the results of the logistical regression which observes 109,508 directed dyads from 1950 to 2000. This table highlights both the direction of variable coefficients and the degree of significance, therefore testing the hypotheses associated with the model. Two out of three of the hypotheses are proven correct by the model: only the second hypothesis, the expectation that trade has a negative effect on conflict, is rejected. All variables, with the exception of *Target Development,* achieve a high level of statistical significance.

For the most part, the results are intuitive. The coefficient on *Economic Development* is negative (-.16) as expected. This indicates that a high-developed state is less likely to initiate a militarized interstate dispute (threat, display, or use of force) than a low-developed state. The coefficient on *Bilateral Trade Volume* is actually positive (1.3e-4), signaling that higher levels of bilateral trade make the initiation of conflict more likely. The interaction term, however, is negative (-1.0e-5). Thus, with increasing levels of economic development, the effects of trade become more and more negative. The coefficients of the control variables are informative as well. *Contiguity, Relative Capability,* and *Joint Democracy* all produce the expected outcomes. *Contiguity*'s positive coefficient (2.2) shows that a state is more likely to initiate conflict with its neighbors. A positive coefficient on *Relative Capability* (.54) demonstrates that a state is more likely to initiate a conflict if it is the relatively stronger state in the dyad. *Joint Democracy*'s negative coefficient (-.82) supports the notion of a "democratic peace" as a state is less likely to initiate a conflict within a dyad composed of two democracies. The only variable without statistical significance is *Target Development*. If significant, its positive coefficient (.05) would indicate that a state is more likely to initiate conflict with a state that is relatively developed.
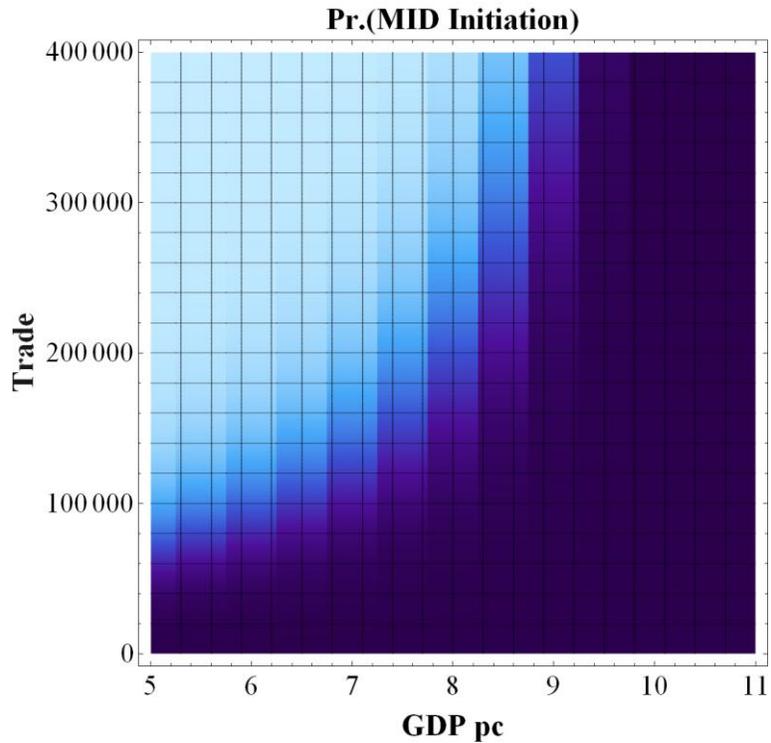
Graphical Analysis: Model 1

Figure 5.1: 3D Representation of MID Likelihood at Different Levels of Trade and Economic Development
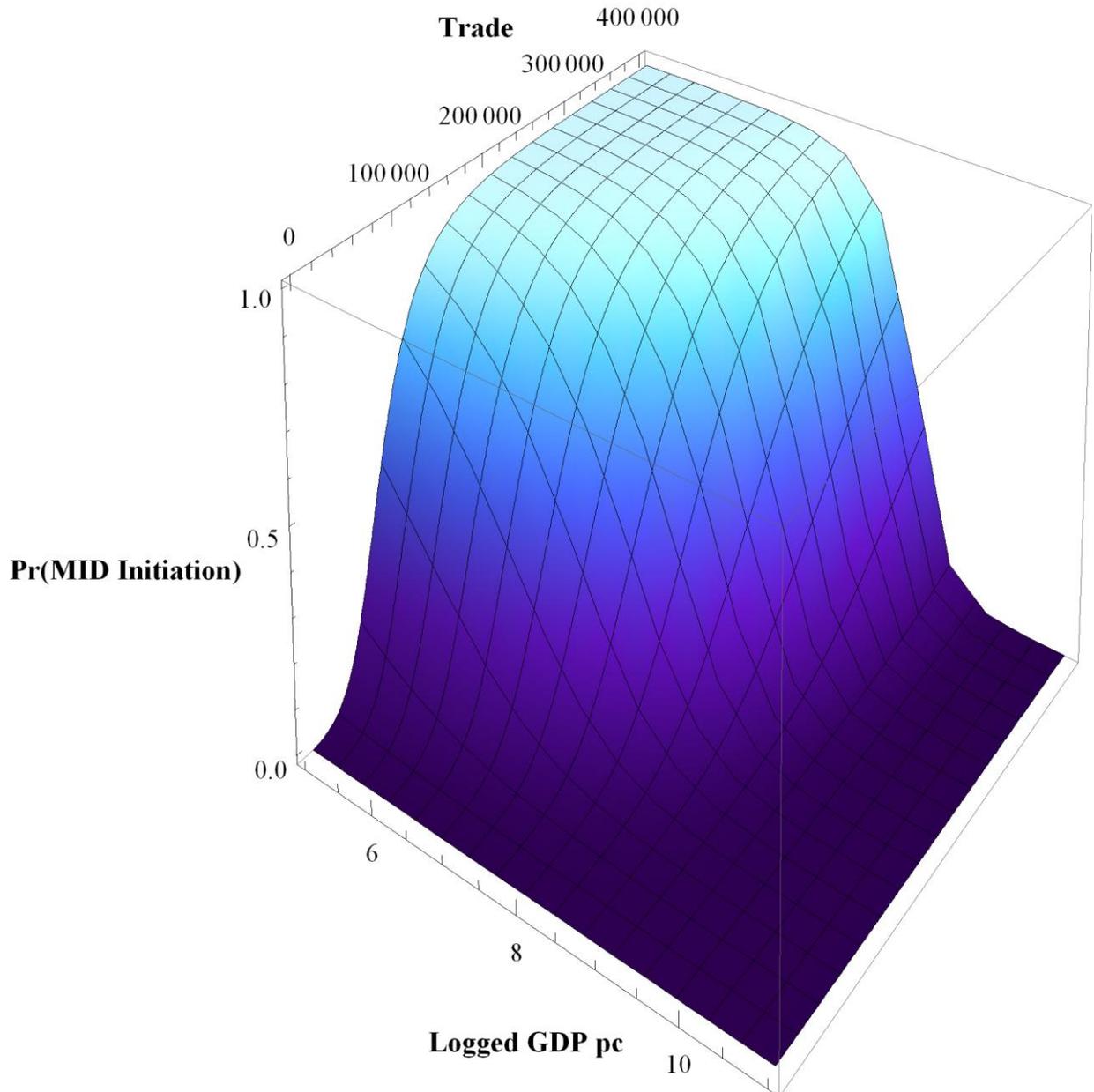
Note: Trade is measured in millions of real (constant) dollars.

Figure 5.2: Conflict Expectation Gradient

Pr.(MID Initiation)

Table 5.2: Estimated Development Level According to Year 2000

Development Level (natural log of GDP per capita)	Countries*
Very High: ln(GDP pc)>11	*None currently: Qatar in 1970s, Kuwait in 1960s*
High: 11>ln(GDP pc)>10	*USA, Luxembourg, Norway, Qatar, Singapore, Australia, UK, Canada, France, Germany*
Moderate: 10>ln(GDP pc)>9	*Italy, Israel, Spain, Russia, Taiwan, Saudi Arabia, New Zealand, Portugal, South Africa*
Low: 9>ln(GDP pc)>8	*Mexico, Brazil, China, Colombia, Egypt, Thailand, Cuba, Venezuela, Bulgaria, Iran*
Very Low: ln(GDP pc)<8	*India, Haiti, Honduras, Bolivia, Guinea, Democratic Republic of the Congo, Iraq*
***Note this is not an exhaustive list**	

Figures 5.1 and 5.2 illustrate simplified, streamlined results from Table 5.1. Figure 5.1 graphically establishes a grid of varying levels of trade (measured in millions of constant dollars) from "0" to "400,000," and varying levels of economic development (measured as the natural log of GDP per capita) from "5" to "12." Note that this graph is a simulation based on the established regression model and *does not* plot actual values. Assuming a continuous logistical regression based on Model 1, MID probabilities (ranging from "0" to "1") are assigned on the vertical axis. The "critical region" is in the top left corner of the graph, corresponding to high levels of trade and low levels of economic development. Shown in light blue, this peak indicates the combination most likely to lead to conflict initiation. Similarly, Figure 5.2 displays these results in the form of a two-dimensional gradient. Once again, light blue corresponds to the most dangerous combination: high levels of trade and low levels of economic development. In the actual distribution, many states had no trade and the maximum value was $381,309.73 million (observed between the United States and Canada in 2000). The average trade volume over the interval was $1,550.57 million.

Table 5.2 provides insight into the distribution of cases and examples of where states lie along the spectrum of development based on the year 2000. As expected, western nations including the United States, the United Kingdom, and France, as well as rich outliers like Qatar and Singapore, are considered highly developed. These are the states least likely to initiate conflict as trade increases. In contrast, low developed states such as Brazil, China, and Mexico, or even poorer states like India, are more likely to become belligerent as trade increases.

Figure 5.3: Marginal Effect of Development
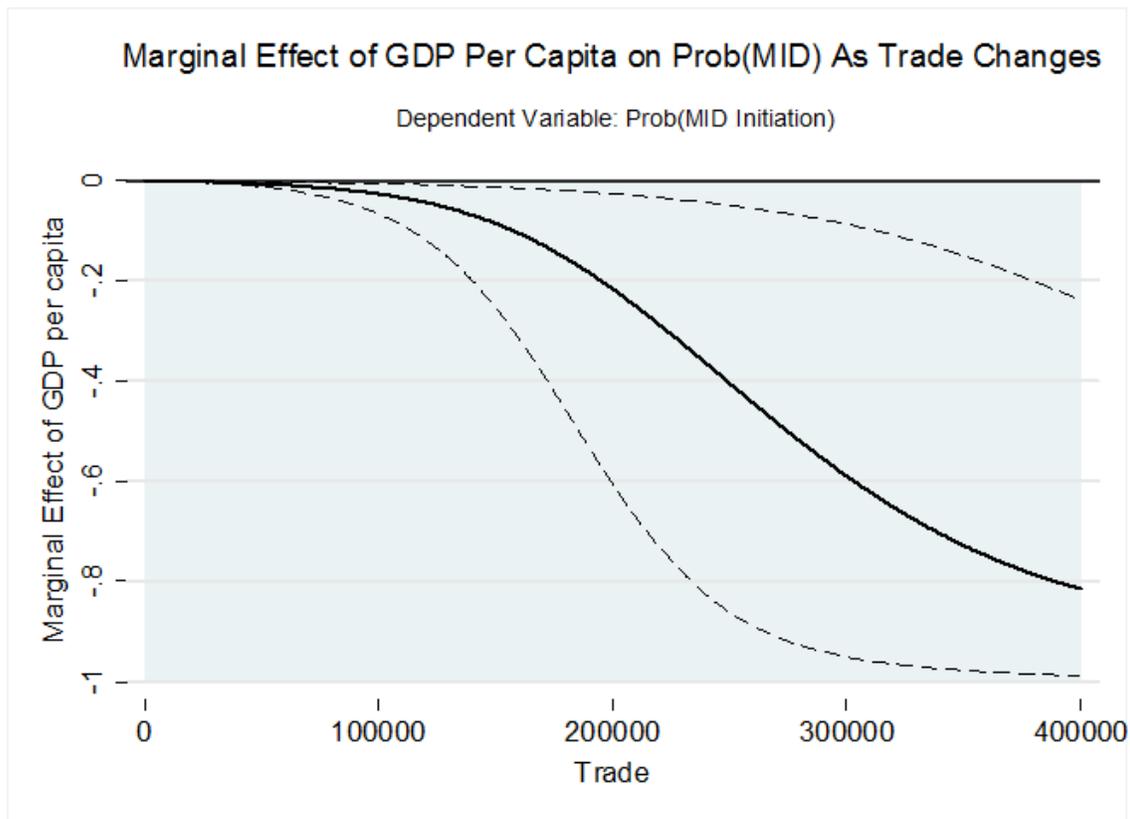
Due to the nature of interactive variables, the examination of marginal effect — the amount of change in one variable due to a one unit change in another variable — is an enlightening form of analysis. It demonstrates the relationship between variables and how that relationship changes with different values. Figure 5.3, for example, illustrates how varying levels of trade affect the role of development at the margin. The estimated marginal effect, according to the model, is characterized by the dark black line, while the dotted lines above and below signify the 95% confidence interval. Given the model, the role of development is always negative: as a state develops it is less likely to initiate conflict. However, as bilateral trade increases, the effects of development become more and more negative. This relationship is exemplified by a marginal effect function which decreases for the entirety of the interval.
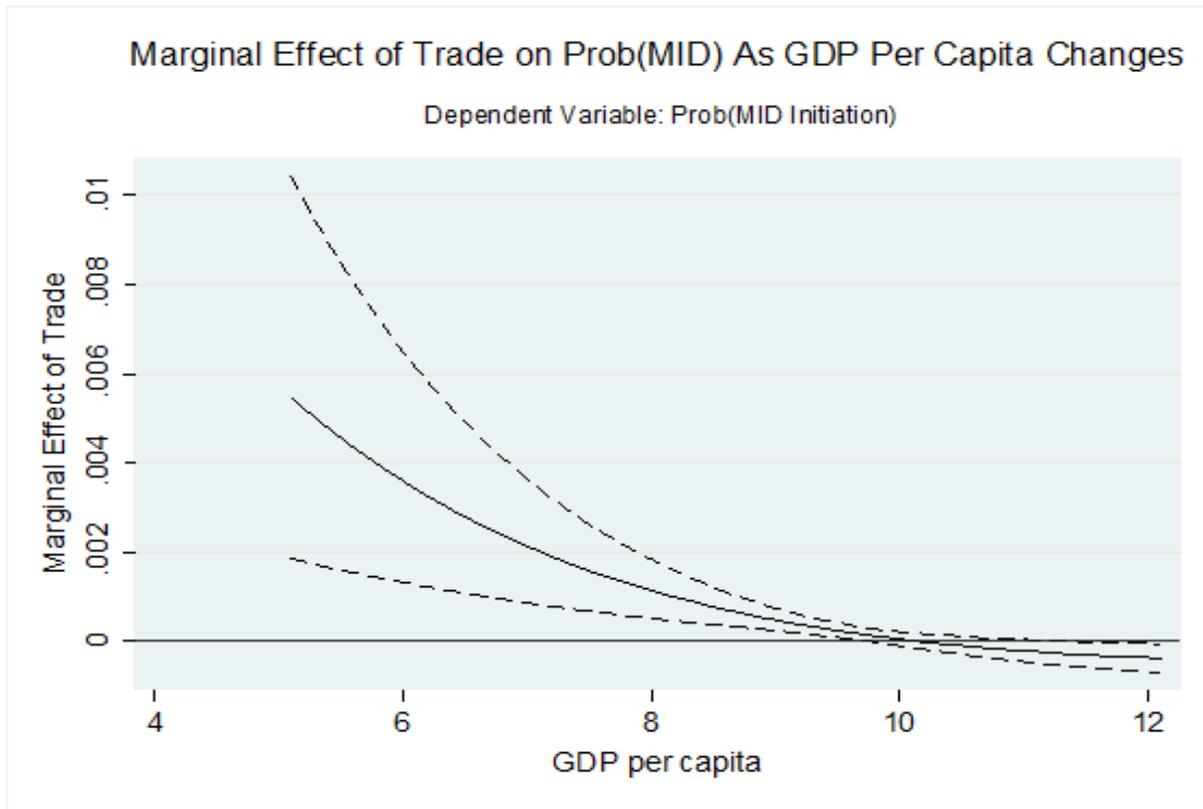
Figure 5.4: Marginal Effect of Trade

Figure 5.4, in contrast, shows how varying levels of development affect the role of trade. As the data analysis reveals, the coefficient on trade is positive and increases the likelihood of conflict in general. The marginal effect graph for trade illustrates this idea in the form of a solid black line which starts out with a positive y-value. However, as GDP per capita increases, the marginal effect of trade decreases, and the line slopes downward. Thus, the conflict-inducing aspects of trade become less and less marked as development increases. Eventually, trade even becomes negative, crossing the x-axis at high levels of development (natural log of GDP per capita > 10). This image is congruent with the notion of a negative interaction coefficient. At high levels of economic development, therefore, the marginal effect of trade lowers the likelihood of conflict initiation.

The Utility of Model 2

Table 5.3: Logistical Regression of the Effects of Development and Trade on Fatal MIDs
(1950-2000)

Variable	*Model 2*
Economic Development: Logged Development of State A	-.28***(.06)
Bilateral Trade Volume	1.2e-3**(.00)
Developed Trade	-1.8e-4**(.00)
Target Development: Logged Development of State B	-.07(.06)
Contiguity	2.6***(.17)
Relative Capability: State A to State B	.22(.17)
Joint Democracy	-.12(.30)
Constant	-4.5***(.61)
N	109365
χ^2	545
Log Likelihood	-1761
*p<.10, **p<.05,***p<.01	

Sources: Gleditsch Expanded Trade and GDP Dataset, MID4 Dataset, EUGene

The results of Model 2 will be used to bolster the findings from Model 1. While Model 1 examines the dependent variable *Conflict Initiation*, Model 2 assesses the level of conflict through *Conflict Intensity*. Model 2, which produced hypotheses similar to Model 1, establishes near mirror results, despite some changes in significance. Once again, the hypothesis that trade reduces the likelihood of conflict, this time involving fatalities, is rejected.

The logistical regression results of Model 2 are effective in making Model 1 more robust. As in Model 1, the coefficient for *Economic Development* is negative (-.28), implying that a state with greater economic development is less likely to initiate an intense conflict involving fatalities. Trade has a positive slope coefficient (1.2e-3), indicating that higher bilateral trade makes the likelihood of an intense conflict more likely. This finding is more counterintuitive than its counterpart in Model 1. While trade may increase interaction frequency and the

likelihood of low-level disputes, it is surprising that disputes involving fatalities are more likely to erupt. It is logical, however, that the interaction term is once again negative (-1.8e-4), which shows that the effects of trade become more negative as development increases. The variable, *Target Development*, still lacks significance but its coefficient has moved in the opposite direction. Thus, a state is less likely to initiate a dispute involving fatalities if the target state is more developed. *Contiguity* remains positive and significant, while *Relative Capability* and *Joint Democracy* lose significance. This indicates that while capability and regime type are important considerations in the decision to initiate conflict, they may not affect the incidence of larger conflicts.

Section VI: Conclusion

One of the most relevant, timeless, and perplexing components of international relations is the enigmatic character of interstate trade. The banner of a "liberal peace" driven by open and integrated world markets, has reigned over the understanding of trade between nations. Yet, the persistence of animosity and conflict across the globe has led many to question its merits. Scholars such as Boehmer and Sobek (2005), as well as Hegre (2000), have enlightened traditional thought by revealing the conditionality of economic development and how it may be understood to qualify the benefits of bilateral trade.

Utilizing the opportunity-willingness framework for context, this quantitative study examined how economic development and bilateral trade volume interact to influence the likelihood of interstate conflict. Through the examination of directed dyads from 1950 to 2000, I framed interstate interaction, while also capturing the motives of the individual state actor. A standard logistical regression tested the hypotheses that economic development, bilateral trade volume, and their unique interaction all work to reduce the likelihood of conflict. The results confirmed that economic development reduces the likelihood of conflict; trade, in contrast, only becomes a pacifying tool at high levels of economic development. For poor countries otherwise lacking opportunity, trade may exacerbate tensions and create an opening for conflict. In contrast, trade is likely to solidify alliances and stifle conflict among rich countries. Thus, depending on economic development, trade may serve as a policy of either *change* or *maintenance* (Morgan and Palmer 2003).

Not only do these findings add depth to Hegre's notion of a developmental "prerequisite" for pacific trade, but they unlock avenues of further research. Lemke (2003) highlights the importance of causality and the idea that just as trade affects conflict, conflict affects trade. The

importance of development and its role in this direction of causality could prove insightful. In addition, this model showcases the relevance of establishing parameters and casting trade in interactive terms. While Mousseau (2000) already produced an interactive model hinging on democracy, future research might consider the effects of contiguity or the homogeneity of interest groups within states. Moreover, despite this model's focus on the level of conflict, the role of escalation was not a centerpiece. Rather than predicting the likelihood of a fatal conflict in general, future researchers might inquire how the role of trade affects the decision of state actors to escalate a non-intense conflict to an intense conflict. Finally, while this model sought to determine the motivations of the initiator, it is possible that there are unique forces operating on the target state as well.

There is not a simple solution when it comes to avoiding conflict — foreign policy cannot guarantee satisfaction within nations or between them. Trade cannot ensure peace, and in many ways, it can disrupt it. Rather than a harbinger of peace, trade may be thought of as a magnifier that exposes and intensifies the realities of the modern world. It can unearth dissent where the situation is unsatisfactory, and brighten interaction where the condition is prosperous. In many ways, trade is two-faced, contingent on circumstance. Ultimately, therefore, economic development should precipitate trade in the evolution toward peace.

References

Baldwin, Richard E., Phillipe Martin, & Gianmarco I.P Ottaviano (2001). Global Income

    Divergence, Trade, and Industrialization: The Geography of Growth Take-Offs. *Journal*

    of Economic Growth 6.1, 5-37.

Barbieri, Katherine (1996). Economic Interdependence: A Path to Peace or a Source of Interstate

    Conflict? *Journal of Peace Research*, 33.1, 29-49.

Bearce, David H. and Eric O'N. Fisher (2002). Economic Geography, Trade, and War. *The*

    Journal of Conflict Resolution 46.3, 365-393.

Bennett, D. Scott, and Allan Stam (2008). "EUGene: A Conceptual Manual." International

    Interactions 26:179-204. Version 3.204, Available from http://eugenesoftware.org.

Boehmer, Charles R. & David Sobek. (2005). Violent Adolescence: State Development and the

    Propensity for Militarized Interstate Conflict. *Journal of Peace Research* 42.1, 5-26.

Bueno de Mesquita, Bruce (1981). *The War Trap,* New Haven: Yale University Press.

Chua, Amy (2003). *World on Fire: How Exporting Free Market Democracy Breeds Ethnic*

    Hatred and Global Instability, New York: Random House, Inc.

Clark, David H., & Patrick M. Regan (2003). Opportunities to Fight: A Statistical Technique for

    Modeling Unobservable Phenomena. *The Journal of Conflict Resolution* 47.1, 94-115.

Correlates of War. *Militarized Interstate Dispute Dataset – Version 3*. Available from

    http://www.correlatesofwar.org/.

Crescenzi, Mark J. C. (2003). Economic Exit, Interdependence, and Conflict. *The Journal of*

    Politics 65.3, 809-832.

Dorussen, Han (2006). Heterogeneous Trade Interests and Conflict: What You Trade Matters.

The Journal of Conflict Resolution 50.1, 87-107.

Gartzke, Erik and Quan Li (2003). Measure for Measure: Concept Operationalization and the Trade Interdependence Conflict Debate. *Journal of Peace Research* 40.5, 553-571.

Gleditsch, K.S. (2004). *Expanded GDP and Trade Data*. Available from http://privatewww.essex.ac.uk/~ksg/exptradegdp.html.

Hegre, Havard (2000). Development and the Liberal Peace: What Does It Take to Be a Trading State? *Journal of Peace Research* 37, 5-30.

Hegre, Havard (2004). Size Asymmetry, Trade and Militarized Conflict. *The Journal of Conflict Resolution* 48.3, 403-429.

Jaggers, Keith and Ted Robert Gurr (1995). Transitions to Democracy: Tracking Democracy's Third Wave with the Polity III Data. *Journal of Peace Research* 32, 469-82.

Lemke, Douglas. (2003). Development and War. *International Studies Review* 5.4, 55-63.

Lemke, Douglas, & William Reed (2001). The Relevance of Politically Relevant Dyads. *The Journal of Conflict Resolution* 45.1, 126-144.

Lenin (1939). *Imperialism: The Highest Stage of Capitalism.* New York: International.

Maoz, Zeev (2009). The Effects of Strategic and Economic Interdependence on International Conflict across Levels of Analysis. *American Journal of Political Science* 53.1, 223-240.

McDonald, Patrick J. (2004). Peace through Trade or Free Trade? *The Journal of Conflict Resolution* 48.4, 547-572.

Morgan, T. Clifton, & Glenn Palmer (2003). To Protect and to Serve: Alliances and Foreign Policy Portfolios. The Journal of Conflict Resolution 47.2, 180-203.

Most, Benjamin A., and Harvey Starr (1989). *Inquiry Logic and International Politics*, Colombia: University of South Carolina Press.

Mousseau, Michael (2000). Market Prosperity, Democratic Consolidation, and Democratic Peace. *The Journal of Conflict Resolution* 44.4, 472-507.

Mueller, John (1989). *Retreat from Doomsday: The Obsolescence of Major War*. New York: Basic.

Nye, Joseph S. (1990). Soft Power. *Foreign Policy* 80, 153-171.

Polachek, Solomon W. (1980). Conflict and Trade. *The Journal of Conflict Resolution* 24.1, 55-78.

Reed, William (2003). Information and Economic Interdependence. *The Journal of Conflict Resolution* 47.1, 54-71.

Ricardo, David (1821). *On the Principles of Political Economy and Taxation*. Library of Economics and Liberty. Available from
http://www.econlib.org/library/Ricardo/ricP.html

Rosecrance, Richard N. (1986). *The Rise of the Trading State: Commerce and Conquest in the Modern World,* New York: Basic.

Russett, Bruce & John R. Oneal (2001). *Triangulating Peace: Democracy, Interdependence, and International Organizations.* New York: W.W. Norton & Company, Inc.

Smith, Adam [1776] 1910. *Wealth of Nations.* London: Aldine Press.

StataCorp (2011). Stata Statistical Software: Release 12. College Station, TX: StataCorp LP.

Wu, Guoguang (2011). China in 2010. *Asian Survey* 51.1, 18-32.

Xiang, Jun, Xu Xiaohong & George Keteku (2007). The Missing Link in the Trade Conflict Relationship. *The Journal of Conflict Resolution* 51.4, 646-663.

Deborah L. Cibos
Academic Vita

EDUCATION:

The Pennsylvania State University – Class of 2012
Schreyer Honors College, Paterno Fellows Liberal Arts Program
Expected B.A. with Honors in Political Science and B.S. in Economics
Minor in French and Francophone Studies
Education Abroad/Immersion Program in Besançon, France (Summer 2010)

Relevant Courses: American Foreign Policy, International Relations, Growth and Development Economics, Advanced International Trade Theory

RESEARCH EXPERIENCE:

Penn State – Intern at the International Center for the Study of Terrorism (Summer 2011)
♦ Analyzed historical articles from *The Irish Times* and extracted information pertinent to the PIRA and the "Bomb to Bombmaker" project
♦ Produced streamlined excel data files to improve clarity

Penn State – Assistant to Dr. Glenn Palmer and graduate students for the MID4 Project (Fall 2010 – Spring 2011)
♦ Coded Militarized Interstate Disputes in South and Central Asia, the Middle East, and North America
♦ Consolidated hundreds of news articles in the context of data construction

LEADERSHIP/ ACTIVITIES:

Springfield THON – Captain (Fall 2011 – Present), Member (Fall 2008 – Present)
♦ Rallied emotional support for Four Diamonds Fund families as Family Care Package Captain
♦ Facilitated fundraising efforts to benefit families of children with pediatric cancer through the Four Diamonds Fund
♦ Represented organization in the 46-hour dance marathon

Schreyer Honors College – Orientation Mentor (Fall 2010), Student Council Member (Spring 2011 – Present)
♦ Guided incoming Honors College scholars as an Orientation Mentor
♦ Honed presentation skills through the administration of campus/housing tours for prospective students as a Student Council Member

HONORS/ AWARDS:

Teach for America, Phoenix 2012 Corps Acceptance
Schreyer Academic Excellence Scholarship (2008, 2009, 2010, 2011)
Bruce R. Miller and Dean D. LaVigne Scholarship in Political Science (2011)
College of the Liberal Arts Scholarship (2009, 2010, 2011)
Schreyer Ambassador Grant (2010)