

**Structure and Change in International Trade and Militarized Conflict:  
When Is Engagement Constructive?\***

Draft. Comments welcome.

by  
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*Abstract.* This paper examines the conditions under which a policy of engagement through trade is likely to be effective in preventing militarized conflict. The analysis contrasts patterns in bilateral and national trade and their effects in a multivariate model. The findings show low bilateral trade ratios due to diversification and yet increasing degrees of economic openness in national trade, indicating that a policy of engagement would be most effective when directed towards integration with the global economy rather than promotion of bilateral trade. The methodology employed in the paper represents a move away from pooled logistic regression to fixed effects logistic regression to take account of heterogeneity among the units (dyads). The results further support the importance of national trade levels in reducing the likelihood of conflict. The results also bring to light the lack of over-time variability among explanatory factors and calls for a closer examination of change in international relations.

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**Introduction**

When is economic engagement most likely to be effective? Economic statecraft, whether to achieve state goals or to resolve conflicts between states, highlights the policy implications of long-standing debates on the role of trade in international politics. Economic engagement, as a form of positive economic sanctions (Baldwin, 1985), contrasts with negative economic sanctions or economic *disengagement*. Negative economic sanctions have received attention in the recent literature as to their effectiveness (Pape 1997, 1998; Elliott, 1998; Baldwin and Pape, 1998). By and large, in spite of the controversy regarding some of the cases, negative economic sanctions do not often achieve success in the form of achieved goals (Hufbauer, Schott and Elliott, 1990). In contrast, current interest in increasing globalization of the international economy speaks to the importance states attach to economic pursuits and suggests that engagement, rather than disengagement through negative sanctions, may well be the more effective policy instrument. As a form of positive sanctions, economic engagement includes a range of policy tools, from foreign aid to most-favored-nation (MFN) status (Baldwin, 1985:42). The effectiveness of economic engagement in international relations may be evaluated according to how likely it is to prevent and to resolve conflict between states. That is, engagement through trade promotes the idea that “it is the spirit of commerce which cannot coexist with war” (Kant, 1795[1948] in Baldwin, 1985). The argument and analysis of this paper is directed towards this nexus between international politics and trade, in an effort to identify the conditions under which

trade policy may best be used to prevent the occurrence of militarized conflict.

The main argument of this paper is that the most effective form of an engagement-through-trade policy can be identified through a close scrutiny of trading patterns themselves, whether in bilateral directions where most studies have directed their attention, or in the general openness of states' economies. Theory and empirical research in international relations offer insights into how a policy of engagement through trade may be pursued. When the dyad, or a pair of countries, is considered the most basic behavioral unit (Bueno de Mesquita and Lalman, 1992), policy emphasizes the aspect of interaction between states. Dyadic studies (Polachek, 1980; Gasiorowski, 1986; Gasiorowski and Polachek, 1982; Barbieri, 1996; Oneal and Russett, 1997; Reuveny and Kang, 1996, 1998) report that bilateral trade characteristics influence the likelihood of militarized conflict between paired states. Hence the implication is, to the extent that trade reduces the propensity for conflict, policy is most likely to be effective when designed to encourage (inter)dependence among particular trading countries. In contrast, others have argued that the causal path between trade and peace lies rather in the nature of the states themselves, such as is represented in the concept of the "trading state" (Rosecranc, 1986). Thus efforts toward preventing and/or resolving conflict should originate with the individual state and should be directed at a deeper integration of a state with the international economy. A direct illustration of the two different approaches is in the example of US policy towards the People's Republic of China: Normalized Trade Relations (NTR) designed to promote bilateral trade versus support of China's membership in the World Trade Organization (WTO) intended to integrate China's economy more fully with the global economy. Which is likely to be the more

effective strategy of economic engagement, or is there no difference?<sup>1</sup>

This paper looks to structure and change in international trade to identify the conditions under which economic engagement is most likely to be effective in preventing international conflict. While earlier work emphasizing the structure of trade included an examination of tariff levels, trade as a proportion of national product, and the regionalization of trade (Krasner, 1976; Keohane, 1997), this paper contrasts two particular aspects of international trade: bilateral and national trading patterns. In so doing, two major findings are reported. First, the structure of international trade is characterized by the diversification of trade across states and, concurrently, increasing trade openness on the part of individual states. Countries are trading a great deal, but not with any one country in particular. Consequently, the proportion of trade taken up between any two countries is very low. How much trade takes place between any two states bears little relation to how much each individual state actually trades, and the proportion of states' economies taken up by trade is much higher than is apparent than from the bilateral trade figures. Hence the attention devoted in current studies to bilateral trade levels does not reflect fully or adequately the overall pattern of trade.

Second, bilateral trading patterns have not changed in the approximately forty-year period examined in this paper, while national trade levels have been increasing. That is, diversification has remained relatively constant through time. In contrast, national trading

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<sup>1</sup> These two issues are, of course, intimately related in that the resolution of bilateral trade issues between China and its trade partners is a precondition for accession to the WTO. Nevertheless, this example is intended to illustrate the contrast between policies promoting bilateral trade versus those promoting a general opening of the national economy.

patterns show increasing degrees of trade openness through this same time frame. The structure of international trade and its trend over time, therefore, show that a policy of engagement would be most effective where it promotes a country's general integration into the global economy, rather than increasing any degree of bilateral dependence.

Differences in bilateral and national trading patterns, and their policy consequences, are also confirmed using multivariate analysis. The empirical analysis employs fixed effects logistic regression analysis to examine influences on the likelihood of militarized conflict between pairs of countries, or dyads, in the international system in the years 1950-1992. The use of fixed effects logistic regression analysis allows for the intrinsic properties of any pair of countries to be taken into account. The dyadic level of analysis makes possible a comparison of bilateral and national trading patterns, by juxtaposing both bilateral trade proportions as well as trade openness within the dyad. With controls for other factors influencing the likelihood of militarized conflict, the impact of national trade openness is stronger than for bilateral trade levels. That is, when it comes to preventing militarized conflict through trade, the importance of trade has less to do with the direction of trade than with the openness of the economies from which it originates. The larger implication of this finding is that when it comes to trade, it is the 'nature' of each state that conditions outcomes in international politics, far more than the characteristics that emerge from the interactions of states such as are observed among pairs of countries.

## Structure and Change in International Trade

Recent studies on trade and international conflict have favored the dyadic level of analysis, perhaps as a consequence of the intense interest in the democratic peace (c.f. Chan, 1997; Brown, Lynn-Jones and Miller, 1996; Elman, 1997) which privileges the dyad as the primary unit of observation. While the absence of war between democracies remains both fact and theoretical controversy (Gates, Knutsen and Moses, 1996), the examination of trade as part of a more general liberal peace (Oneal and Russett, 1997; Russett, Oneal, and Davis, 1998) also leaves open the question of the appropriate level from which to examine the causal connections between trade and militarized conflict. That is, in spite of the attention given to bilateral trade in the literature, it is worthwhile to direct a more critical eye to whether bilateral figures best reflect the trading patterns of states and consequently their involvement in international conflict. What do trading patterns look like? Do states concentrate or diversify their trade? Furthermore, to what extent is the likelihood of conflict affected by the degree of bilateral dependence within the dyad, or alternatively, is the connection more likely to be found in the national trading patterns of each state comprising the dyad? The answer(s) to these questions can be found in the structure of international trade, as seen in the contrasting patterns and trends in both bilateral and national trade.

Table 1 presents a range of percentile values for bilateral and national trade, aggregated for the full time period: 1950-1992. Both are measured as a proportion of gross domestic product (GDP), so as to reflect the importance vis-à-vis the domestic economy. Bilateral dependence in trade is extremely low: 90 percent of cases fall below .76 percent. That is, for the

Table 1. The Structure of Trade: Bilateral and National Trading Patterns

Percentile Values	Bilateral Trade	National Trade
Lowest	0	4.67
1%	0	8.90
10%	0	21.34
25%	0	34.18
50% (median)	.02	53.42
75%	.18	78.93
90%	.76	112.28
95%	1.82	137.06
99%	8.02	209.52
Highest	182.30	423.41
Mean	.44	62.39
N	284,931	5,039

vast majority of cases, bilateral trade between any pair of countries is less than 1 percent of each country's economy, at any one point in time. This is in contrast to national trade figures, which are quite evenly distributed, with a median value of 53.42 percent. Thus trade takes up about half of total economic activity for the median country. This initial representation makes two points. First, countries are indeed trading a great deal in the 1950-1992 time period; however, this is not readily apparent in the very low bilateral trade ratios. Second, the combination of high national trade and low bilateral trade proportions suggests that trade is also very much diversified across partner countries. Given that trade is diversified and bilateral trade ratios are therefore generally very low, in concentration or dependence, they preclude, in effect, any strongly conclusive claims about the effects of bilateral trade measures themselves, whether empirically or applied to the policy realm.

Taking a closer look at trading patterns over time, Figures 1 and 2 show the trends in median bilateral and national trade ratios, which are plotted annually.<sup>2</sup> Trade figures disaggregated annually reflect generally the same pattern. Median values for bilateral trade fall between .01 and .08 percent of trading countries' GDP, which, again, are very low figures. Across time, there is change, though within a very small range, that reflects a decrease in the level of bilateral trade dependence. That is, while bilateral trade levels were very low to begin with, they have, at the same time, decreased over time. As for national trading patterns, the picture looks quite different. Annual median values show a range between 37.53 and 66.44. Certainly countries are trading more than is apparent than from the bilateral figures. In addition, seen across time, there is also change in national trading patterns: trade openness has been increasing over time. This stands in contrast to bilateral trade dependence, which exhibits a trend in the opposite direction.

The differences in patterns of bilateral and national trade demonstrate just how countries have been trading in the 1950-1992 period. The combination of low bilateral trade but high national trade shows that countries have been pursuing a strategy of diversification. For the most part trade is not concentrated in any particular trading partner, though this may look different a regional context (Mansfield and Milner, 1999). The diversification of trade on the part of states also means that the disruption of trade with any particular country is less likely to be of serious

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<sup>2</sup> Median values are employed, rather than mean values, given that bilateral trade figures cluster around values close to zero with very few at high levels. Given the distribution of mean trade levels, median values are employed as they give less weight to the skewness of the data and reflect the 50<sup>th</sup> percentile values, the "middle" value of trade levels across the years. National trade proportions exhibit less skewness in their distribution; hence mean and median levels do not differ greatly.

consequence. Trade with a particular country can be diverted to other partner countries if it should be disrupted for some reason (such as a militarized conflict).<sup>3</sup> The increasing openness of trade sectors thus provides for lower costs in adjustment when bilateral trade is disrupted.

At the same time, as states' trade sectors take up a greater proportion of overall economic activity, the cost of engaging in any militarized conflict, such as war in the extreme case, is likely to have far broader consequences for the whole of the economy. Exports to and imports from the countries in conflict are likely to be affected by the diplomatic conditions as well as the mobilization of resources that are then diverted from the economic to the defense sectors. Thus both in terms of the cost of adjustment in trade and the far-reaching economic impact of militarized conflict, national trade should matter far more than bilateral trade characteristics. For the policy perspective, then, policies directed at the bilateral level are less likely to be as effective as a policy directed towards national trading patterns and towards greater integration with the international economy.

### **Bilateral and National Trade in a Multivariate Analysis**

The importance of national trade, relative to bilateral trade, is also supported in a multivariate analysis of militarized conflict. The rationale for extending to the multivariate analysis is to incorporate statistical controls for other explanatory factors associated with the presence of militarized conflict and to assess, above and beyond these factors, the effects of

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<sup>3</sup> The degree to which trade can be diverted, of course, depends on the elasticity of supply and demand for the traded good, which is especially applicable for natural resources such as oil.

bilateral and national trade levels. The data consist of a panel of dyads, or pairs formed from countries in the international system in a given year, observed for the years 1950-1992. The dependent variable is indicated by the presence or absence of a Militarized Interstate Dispute (MID), constructed from the data compiled by Bremer (1996). The presence of a MID includes the threat, display, and use of force, and war between any given pair of countries for a given year (Jones, Bremer and Singer, 1996).

### **Data and Measurement**

The control variables included in the analysis include those that have been prevalent in current studies of international conflict (Vasquez, 1993; Levy, 1989). The group of variables includes geographical contiguity, capability ratio, growth, alliance, democracy, and bilateral and national trade figures. Contiguity is a dichotomous measure indicating the presence or absence of a shared land border between a given pair of states, intended to capture the importance of territorial disputes as a cause of militarized conflict (Vasquez, 1993). Capability ratio is based on each state's share of military capabilities in the international system in a given year. A state's capabilities index is computed taking into account demographic, economic, and military resources that may be mobilized for war, which is then reconstructed as a proportion of total military capabilities present in the system to indicate a given state's place in the distribution of power in the system (Waltz, 1979). The measure employed for the dyadic analysis is the ratio of the larger to the smaller proportion of capabilities in the system. The measure is constructed according to Singer (1990). Growth is indicated by the lower three-year average growth rate in GDP per capita within the dyad, representing the effect of domestic economic conditions (Oneal

and Russett, 1997). Alliance is a dichotomous variable indicating the presence or absence of a formal alliance (Singer and Small, 1966). Democracy is based on net democracy scores within the dyad, which is computed by subtracting the autocracy score from the democracy score for each state and taking the lower value for the pair (Oneal and Russett, 1997). Data for contiguity, capability ratio and alliance were obtained from the updated Correlates of War project (1995), GDP per capita (in constant dollars) from the Penn World Tables, version 5.6 (Summers and Heston, 1991), and democracy from the Polity III project (Jagers and Gurr, 1995).

Data for the variables of interest—bilateral and national trade—were obtained from the *Direction of Trade Statistics* of the International Monetary Fund and the Penn World Tables, respectively. The measures are expressed as the sum of exports and imports as a proportion of gross domestic product (GDP), to capture the importance of trade to each country's domestic economy. For the bilateral figures, the analysis includes the value of the lower bilateral (or dyadic) trade to GDP for a given year within the dyad. National trade figures represent a country's total foreign trade as a proportion of its GDP. In effect, national trade levels reflect the extent of openness of a country's economy. As was the case for the bilateral figure, the lower of the national trade levels within the dyad is included in the model.

### **The Weak-Link Assumption**

Several of the variables included in the model are based on what has come to be known as the weak link assumption, extended from the democratic constraint proposition in Bueno de Mesquita and Lalman (1992). The original argument in this proposition is that democracies fight

with non-democracies because the latter face less in the way of domestic political constraints on behavior. A more general form of this proposition is that behavioral outcomes in, for example, a dyad, is conditional on the less constrained member—the weak link. The assumption can be applied more broadly to cover a variety of conditions and provides for a theoretically consistent model. In the present analysis, this weak link assumption is applied to the measurement of the growth, democracy, and bilateral and national trade measures. For each variable, the lower of the two values within the dyad is included in the model, capturing the effects of the less constrained state within the dyad. While the outcome is conditioned on a particular member of the dyad, to the extent that the lower value also captures the level of economic growth, democracy, or trade common to both states forming the dyad, the particular measure is essentially cast at the dyadic level.<sup>4</sup>

### **Methodology: Fixed Effects Logistic Regression**

The analysis in this paper represents a move away from pooled cross-sectional time-series methods by applying quantitative methodology designed for longitudinal data. Given that

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<sup>4</sup> Of course, this weak link assumption does not go unchallenged. Studies have explored and argued for different types of measures, including the sum of values within the dyad, their geometric mean, or both the lower and higher values (Oneal and Ray, 1997; Henderson, 1999). Fundamentally, it is a question of where to locate the causal effect. Given that the level of analysis is the dyad, where are the causal effects to be found? Figures such as the geometric mean or the sum provide what are purely dyadic measures in that equal weight is given to information from both states that is then combined into a common measure. The use of separate measures for each state implies, instead, that behavioral outcome at the dyadic level is conditioned on the individual states. Thus outcomes resulting from the interactions of states is dependent not on the dynamics between the two states but on individual state characteristics. Application of the weak link assumption fall somewhere in the middle: the measure weighs one value more highly but at the same time captures what is common to both states in the dyad.

the research design involves looking at pairs of countries over time and the dependent variable is dichotomously measured, fixed effects logistic regression is employed to estimate the model. The sample for analysis includes all dyads for which there are data for any twenty or more years between 1951 and 1992.<sup>5</sup> Admittedly twenty years is an arbitrary criterion; however it provides a useful time frame in which to observe over-time variability, if any, in both behavior and the explanatory factors. The data comprise an unbalanced panel in that not all dyads are observed for the same number of years due to missing data or entry and exit from the system. The sample includes 2,964 dyads observed over a range of 20 to 42 years.

The analysis builds upon the recent work by Green, Kim and Yoon (1999) which points out the problems associated with pooling of time-series cross-sectional data as has been the norm in studies of international conflict. The use of fixed effects logistic regression takes account of unobserved heterogeneity that distinguishes the units, or pairs of countries in this case. The method allows the analysis to abandon the assumption that all dyads have the same baseline probability of involvement in a dispute. Instead, unobserved (or unmeasured) factors, or fixed effects, affect a dyad's tendency toward militarized conflict above and beyond and effects of explanatory factors included in the model. It has been shown that failure to account for the unobserved heterogeneity among the units, or fixed effects, results in inconsistent estimates (Hsiao, 1986:159-161). Fixed effects regression also makes the most of over-time variation in the explanatory variables and is distinguished from the pooled approach, which makes the heroic assumption of independence across both space (the dyads) and time (the years) and is attended

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<sup>5</sup> Although data for other variables cover the period 1950-1992, the growth variable is constructed as a percentage change from the previous year, thus excluding 1950 in the analysis.

by a host of methodological problems (Stimson, 1985). The analysis employs the estimation procedure laid out in McFadden (1974) and Chamberlain (1980) which makes the probability of a positive outcomes (such as a militarized dispute) conditional on the distribution of outcomes within each unit.<sup>6</sup>

Recent work on international conflict has benefited from the contribution of Beck, Katz and Tucker (1998), who proposed a solution to the time-dependent nature of the data by the inclusion of a variable indicating the number of years since the last conflict within a dyad (*Peace Years*). The analysis includes this time-dependence variable (Tucker, 1998) as an explanatory factor. It is also worth noting that the analysis also included variables to indicate the presence of one or two major powers within the dyad (Bremer, 1992) and distance (Lemke, 1995). However, these are time-invariant regressors; that is, major power status and distance between capitals for the dyads have remained unchanged in the time frame covered here and therefore are dropped in the estimation procedure.

## **Findings**

Table 2 reports the findings from the analysis.<sup>7</sup> The table is divided into three parts. The first (Model I) and second (Model II) columns show the results from including the trade terms in separate analyses, and the third column (Model III) reports the full model with both trade terms.

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<sup>6</sup> See also Baltagi (1995). Estimations were carried out using the *clogit* procedure in STATA, version 6.0, with the dyad as the grouping variable.

<sup>7</sup> The findings may be contrasted with those from the more conventional pooled analysis, which is not reported here but show results consistent with existing studies.

The effects of bilateral and national trade levels differ markedly. The coefficients for bilateral trade are positive and neither is statistically significant. In contrast, the coefficients for national trade are consistently negative and statistically significant. The results in the full model provide a comparison that shows that above and beyond the effects of bilateral trade levels, national trade levels figure more prominently in its association with a lower likelihood of militarized conflict.

The findings demonstrate the characteristics of structure and change in international trade and how these are associated with militarized conflict. The lack of statistical significance in the effect of bilateral trade levels is contrasted by the significant effect of national trade, which is consistent with the univariate patterns presented in the earlier part of this paper. The structure of trade is diversified at the bilateral level: trade between any pair of countries remains low. At the same time, as countries themselves are increasingly characterized by larger trade sectors and integration with the global economy. Consistent with these patterns, the impact on the likelihood of militarized conflict for bilateral effects is significantly weaker than national effects. As for change, the findings are also consistent with the time trends that are identified. The weak effect of bilateral trade also reflects the fact that bilateral trade levels have not changed very much over time, while the result for national trade illustrates the effect of increasing trade openness.

As for the control variables, the effect of contiguity is in the expected positive direction and statistically significant. Even after accounting for heterogeneity among the dyads, geographical contiguity figures as an empirically important determinant of conflict. Capability ratio also has a positive coefficient; however, the effect is not statistically significant. While the influence of economic conditions is arguably inconclusive (Bremer, 1992), in this analysis

growth has a negative coefficient and is statistically significant, indicating that dyads consisting of states experiencing a favorable domestic economic environment are less likely to engage in militarized conflict. Similarly, alliance, which is also a subject of some debate as to its influence in the likelihood of conflict (Vasquez, 1993), has a negative coefficient but is not statistically significant when the national trade term is included and in the full model. The time dependence variable, *peaceyears*, has a negative coefficient and is statistically significant, associating dyads at peace for longer periods of time with the tendency not to engage in militarized conflict.

Finally, the surprising result here is the finding for democracy, which has a negative coefficient but is not statistically significant. Democracy has been found to be associated consistently, across a wide variety of conditions, to be an important factor in the prevention of conflict and has been a subject of tremendous debate (Miller et. al, 1996; Elman, 1997). In the context of a panel model, however, the impact of democracy is much weaker than has been previously found and reflects either the lack of change in levels of democracy within the dyad or simply no significant effect even with over-time variability.

### **When is Engagement Constructive?**

The patterns in bilateral and national trade figures, as well as the relative importance of national trade levels found in the multivariate analysis, are important for several reasons. They show that in addressing the question of when engagement through trade is likely to be effective in preventing conflict, it is reasonable to consider how countries trade in the first place. With respecting to building a policy of economic engagement, what aspect of states' trading patterns

should one be concerned about? The highly diversified trade among countries suggests that the cost of adjustment is lower should there be a disruption between any two countries, and thus policy directed towards bilateral trade is less likely to be effective. Yet as countries also become increasingly integrated into the global economy through larger trade sectors, policy is likely to be more effective when it address a country's overall trade and its place in the international economy. To return to the example of US' policy towards China introduced earlier, this paper shows that there is a difference between policies regarding the latter's MFN status and WTO accession. As national trade figures more prominently in its influence on conflict, so it is also more important for US policy of "deep engagement" toward China to promote an overall opening of its trade sector than to be limited to encouraging bilateral trade with the US. Engagement through trade, then, is more likely to be effective through US support of China's entry into the WTO than an emphasis on China's MFN status vis-à-vis the US.

The differentiation between bilateral and national aspects of trade and the importance of the latter also contrasts two fundamentally different causal mechanisms. On the one hand, bilateral trade emphasizes the interaction between countries. On the other, the effect of national trade gives more prominence to the characteristics of the countries themselves. This poses an interesting tension in the context of dyadic studies. To what extent do state characteristics matter for dyadic outcomes? Or, alternatively, are outcomes in international relations dependent upon the interactions of states or the "nature" of the states themselves?<sup>8</sup> In the case of trade, the findings of this study support the latter. Moreover, increasing trade openness on the part of countries gives renewed importance to Rosecrance' (1986) conceptualization of the "trading

state,” as a new type of state that reflects the increasing economic interdependence among countries in the post World War II period. The trading state possesses a fundamentally different nature that defines the state and its objectives. The concept incorporates the assumption that states’ objectives have turned inwards toward economic growth and prosperity. In its turn, countries tend to favor high levels of commercial exchange over territorial conquest, though whether territorial conquest is also attended by economic benefits remains a point of challenge (Lieberman, 1996).

## **Conclusion**

The arguments and findings of this paper also present some questions for further theoretical and empirical refinements. In addition to the difference in how much bilateral and national trade levels have changed across time, the use of fixed effects regression as a methodology tailored to longitudinal data brings to light the importance of looking for change in factors that explain the occurrence of militarized conflict. This is best illustrated by the variables that were dropped from the analysis because they exhibit no variation across time. These variables include major power membership in the dyad and distance between capitals. Studies have consistently found major power status and contiguity to be among the most important determinants of conflict (Bremer, 1992). While varying time periods covered in this study have provided variation for contiguity by way of border changes, major power status, as it is currently defined, has seen no change in the 1950-1992 period, for example to incorporate the role of new “civilian powers” such as Japan and Germany (Betts, 1993/1994). The weak effect of

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<sup>8</sup> The author is grateful to Alex Wendt for this point.

democracy on the likelihood of conflict may also be attributed to the lack of change in the characteristics of polities. Thus it appears that change occurs infrequently for certain characteristics of states as well as the dyads formed from them, and by construction these are not designed to reflect change. The lack of change observed in substantively important variables such as major power status and democracy poses a challenge for further studies to identify, then, where the sources of change may be found that qualify as newly emerging sources of conflict.

The analysis of dyadic behavior over time also gives rise to the question of whether there may be short- and/or long-term trends that may be identified. The sample on which the analysis is based includes dyads for which there are 20 or more observations for the 1950-1992 period. The cases are distributed almost equally between dyads observed for less than thirty years or more, thus providing a variation in short- and long-term behavior. Further analyses would prove useful in examining the extent to which the likelihood of militarized conflict is affected by the instability possible in dyads with “new” states and whether, in the long term, such patterns stabilize.<sup>9</sup> Some insight has already been provided in the literature on the impact of polity change and conflict (Enterline, 1998; Mansfield and Snyder, 1995), which can be re-examined and extended to causal factors that may be distinguished for their effects in the short- and long-terms.

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<sup>9</sup> Additional analyses, not reported here, were conducted for a balanced panel for 1960-1989, which included dyads observed for the full thirty-year period. With a distribution of the explanatory variables comparable to the unrestricted sample, the results suggest that dyadic characteristics in the long term do not change very much, and it is more likely that change is observed in the short term, or the early years of dyads entering the system.

The findings of this paper and the questions that are raised together form a general appeal for the role of change in international relations. Aside from the structure of international trade that emphasizes the role of national characteristics in lowering the likelihood of militarized conflict, the paper also examines a crucial component: change. The importance of change is illustrated in increasing degrees of trade openness and its association with a reduction in conflict, but may be more widely applied to the challenge of identifying new sources of change, and hence new sources of peace and conflict among states. Furthermore, the appeal is also directed in favor of methodologies such as the fixed effects model employed in this paper, or models of transition (Jackman, 1998, 1999), which makes the most of longitudinal studies found in international relations.

## References

- Baldwin, David A. (1985) *Economic Statecraft*. Princeton: Princeton University Press.
- Baldwin, David A. and Robert A. Pape (1998) Evaluating Economic Sanctions. Correspondence. *International Security* 23: 189-198.
- Baltagi, Badi H. (1995) *Econometric Analysis of Panel Data*. Chichester: John Wiley and Sons.
- Barbieri, Katherine (1996) Economic Interdependence: A Path to Peace or a Source of Interstate Conflict? *Journal of Peace Research* 33: 29-49.
- Beck, Nathaniel, Jonathan N. Katz, and Richard Tucker (1998) Beyond Ordinary Logit: Taking Time Seriously in Binary Time-Series--Cross-Section Analysis. *American Journal of Political Science* 42: 1260-1288.
- Betts, Richard K. (1993/1994) Wealth, Power, and Instability: East Asia and the United States after the Cold War. *International Security* 18: 34-77.
- Bremer, Stuart (1996) Militarized Interstate Disputes, Version 2.1, 1816-1992.
- Bremer, Stuart (1992) Dangerous Dyads: Interstate War, 1816-1965. *Journal of Conflict Resolution* 36: 309-341.
- Brown, Michael E., Sean M. Lynn-Jones and Steven Miller, eds. (1996) *Debating the Democratic Peace*. Cambridge: The MIT Press.
- Bueno de Mesquita, Bruce and David Lalman (1992) *War and Reason: Domestic and International Imperatives*. New Haven: Yale University Press.
- Chamberlain, Gary (1980) Analysis of Covariance with Qualitative Data. *Review of Economic Studies* 47: 225-238.
- Chan, Steve (1997) In Search of Democratic Peace: Problems and Promise. *Mershon*

- International Studies Review* 41: 59-91.
- Elliott, Kimberly Ann (1998) The Sanctions Glass: Half Full or Completely Empty?  
*International Security* 23: 50-65.
- Elman, Miriam Fendius, ed. (1997) *Paths to Peace: Is Democracy the Answer?* Cambridge: The MIT Press.
- Enterline, A.J. (1998) Regime Change, Neighborhoods, and Interstate Conflict, 1816-1992.  
*Journal of Conflict Resolution* 42: 804-829.
- Gasiorowski, Mark (1986) Economic Interdependence and International Conflict: Some Cross-National Evidence. *International Studies Quarterly* 30: 23-38.
- Gasiorowski, Mark and Solomon W. Polachek (1982) Conflict and Interdependence: East-West Trade and Linkages in the Era of Detente. *Journal of Conflict Resolution* 26: 709-29.
- Gates, Scott, Torbjørn L. Knutsen, and Jonathon W. Moses (1996) Democracy and Peace: A More Skeptical View. *Journal of Peace Research* 33: 1-10.
- Green, Donald P., Soo Yeon Kim, and David Yoon (2001) *Dirty Pool*. International Organization, forthcoming.
- Henderson, Errol A. (1999) Neoidealism and the Democratic Peace. *Journal of Peace Research* 36: 203-231.
- Hsiao, Cheng (1986) *Analysis of Panel Data*. Cambridge: Cambridge University Press.
- Hufbauer, Gary Clyde, Jeffrey J. Schott, and Kimberly Ann Elliott (1990) *Economic Sanctions Reconsidered*. 2<sup>nd</sup> revised ed. 2 vols. Washington, D.C.: Institute for International Economics.
- Jackman, Simon (1999) In and Out of War and Peace: The Statistical Analysis of Discrete Serial Data on International Conflict. Manuscript.

- Jackman, Simon (1998) Time Series Models for Discrete Data: Solutions to a Problem with Quantitative Studies of International Conflict. Manuscript.
- Jagers, Keith and Ted Robert Gurr (1995) Tracking Democracy's Third Wave with the Polity III Data. *Journal of Peace Research* 32: 469-482.
- Jones, Daniel M., Stuart A. Bremer, and J. David Singer (1996) Militarized Interstate Disputes, 1816-1992: Rationale, Coding Rules, and Empirical Patterns. *Conflict Management and Peace Science* 15: 163-213.
- Keohane, Robert O. (1997). Problematic Lucidity: Stephen Krasner's "State Power and the Structure of International Trade." *World Politics* 50: 150-170.
- Krasner, Stephen D. (1976) State Power and the Structure of International Trade. *World Politics* 28: 317-347.
- Lemke, Douglas (1995) The Tyranny of Distance: Redefining Relevant Dyads. *International Interactions* 21: 23-38.
- Levy, Jack S. (1989) "The Causes of War: A Review of Theories and Evidence." In *Behavior, Society, and Nuclear War*, edited by Phillip Tetlock, Jo L. Husbands, Robert Jervis, Paul C. Stern, and Charles Tilly, pp. 260-262. New York: Oxford University Press.
- Lieberman, Peter (1996) *Does Conquest Pay? The Exploitation of Occupied Industrial Societies*. Princeton: Princeton University Press.
- McFadden, D. (1974) "Conditional Logit Analysis of Qualitative Choice Behavior." In *Frontiers in Econometrics*, edited by P. Zarembka, pp. 105-142. New York: Academic Press.

- Mansfield, Edward D. and Helen V. Milner (1999) The New Wave of Regionalism. *International Organization* 53: 589-627.
- Mansfield, Edward D. and Jack Snyder (1995) Democratization and the Danger of War. *International Security* 20: 5-38.
- Oneal, John R. and James Lee Ray (1997) New Tests of the Democratic Peace: Controlling for Economic Interdependence, 1950-1985. *Political Research Quarterly* 50: 751-775.
- Oneal, John R. and Bruce Russett (1997) The Classical Liberals Were Right: Democracy, Interdependence, and Conflict, 1950-1985. *International Studies Quarterly* 41: 267-293.
- Pape, Robert A. (1998) Why Economic Sanctions Still Do Not Work. *International Security* 23: 66-77.
- Pape, Robert A. (1997) Why Economic Sanctions Do Not Work. *International Security* 22: 90-136.
- Polachek, Solomon (1980) Conflict and Trade. *Journal of Conflict Resolution* 24: 55-78.
- Reuveny, Rafael and Heejoon Kang (1998) Bilateral Trade and Political Conflict/Cooperation: Do Goods Matter? *Journal of Peace Research* 35: 581-602.
- Reuveny, Rafael and Heejoon Kang (1996) International Trade, Political Conflict/Cooperation, and Granger Causality. *American Journal of Political Science* 40: 943-970.
- Rosecrance, Richard (1986) *The Rise of the Trading State: Commerce and Conquest in the Modern World*. New York: Basic Books.
- Russett, Bruce, John R. Oneal and David R. Davis (1998) International Organizations and Militarized Disputes, 1950-1985. *International Organization* 62: 441-467.
- Singer, J. David (1990) *Models, Methods, and Progress: A Peace Research Odyssey*. Boulder: Westview Press.

- Singer, J. David Singer and Melvin Small, Principal Investigators (1995) Correlates of War (COW) Project.
- Singer, J. David Singer and Melvin Small (1966) Formal Alliances, 1815-1939: A Quantitative Description. *Journal of Peace Research* 3: 1-32.
- Stimson, James A. (1985) Regression in Space and Time: A Statistical Essay. *American Journal of Political Science* 29: 914-947.
- Summers, Robert and Alan Heston (1991) The Penn World Table (Mark 5): An Expanded Set of International Comparisons, 1950-1988. *Quarterly Journal of Economics*: 327-368.
- Tucker, Richard (1998) TIMEDEP: A Program for Constructing a Spell-Identification Variable. Version 1.0.2 Cambridge, MA: Harvard University, August.  
<http://www.fas.harvard.edu/~rtucker>
- Vasquez, John A. (1993) *The War Puzzle*. Cambridge: Cambridge University Press.
- Waltz, Kenneth N. (1979) *Theory of International Politics*. Reading: Addison-Wesley.