Causes of Peace: Democracy, Interdependence, and International Organizations, 1885–1992

JOHN R. ONEAL
University of Alabama

BRUCE RUSSETT
Yale University

MICHAEL L. BERBAUM
University of Illinois at Chicago

Previous studies provide strong evidence for the Kantian theory of peace, but a satisfactory evaluation requires establishing the causal influence of the variables. Here we focus on the reciprocal relations between economic interdependence and interstate conflict, 1885–1992. Using distributed-lags analyses, we find that economically important trade does have a substantively important effect in reducing dyadic militarized disputes, even with extensive controls for the influence of past conflict. The benefit of interdependence is particularly great in the case of conflict involving military fatalities. Militarized disputes also cause a reduction in trade, as liberal theory predicts. Democracy and joint membership in intergovernmental organizations, too, have important pacific benefits; but we find only limited support for the role of costly signals in establishing the liberal peace. We find no evidence that democratization increases the incidence of interstate disputes; and contrary to realists' expectations, allies are not less conflict prone than states that are not allied. Democracies and states that share membership in many international organizations have higher levels of trade, but allies do not when these influences are held constant.

In Perpetual Peace (1927 [1795]), Immanuel Kant suggested that international peace could be established on a foundation of three elements: republican constitutions, “cosmopolitan law” embodied in free trade and economic interdependence, and

Authors' note: We thank Margit Bussmann, Walter Enders, Håvard Hegre, J. Lew Silver, Frances Oneal, Christopher Sims, and Peter van den Dugen for helpful advice on difficult issues, and the institutions that supported this research: the Ford Foundation, the Norwegian Nobel Institute, the U.S.-Norway Fulbright Foundation for Educational Exchange, and the National Science Foundation. Earlier versions of the paper were presented at the workshop “Globalization and Armed Conflict” of the European Consortium on Political Research, Copenhagen, April 15–19, 2000; the Norwegian Nobel Institute, Oslo, May 11, 2000; the annual meeting of the Peace Science Society (International), New Haven, CT, October 28, 2000; and the annual meeting of the American Political Science Society, San Francisco, CA, August 31, 2001. Our data and the log-files showing our principal results are posted at http://bama.ua.edu/~joneal/causes.

international law and organizations. This was a visionary proposal. There were very few democracies in the world in 1795 and no international organizations as we now know them. There was trade, of course; but most countries followed mercantilist principles: subordinating commerce to the interests of the state, seeking economic independence when possible, and pursuing economic gains through the use of force. Though Kant presented his ideas over 200 years ago, it has only recently become possible to evaluate his “philosophical sketch” scientifically. In this article we focus on the causal influence of the three Kantian elements on peace, paying particular attention to the benefits of interdependence. We also assess the reciprocal relation of conflict on trade, an integral element of liberal theory.

Over the past twenty years, research on the correlates of war has progressed rapidly by examining the relations of pairs of states (dyads) observed through time. The analysis of dyadic time series marks an important advance over research at either the global or the national level. Attention to pairs of states addresses the questions of greatest concern to political scientists and policymakers alike: which countries are likely to fight one another, and which will remain at peace? Thus dyadic studies escape the ecological fallacy that plagued research at the systemic level; and unlike investigations of individual nations, dyadic analyses easily accommodate variables that are inherently relational in character, including the balance of power, existence of an alliance, or degree of interdependence.

Nevertheless, few dyadic analyses have exploited the dynamic information contained in the large pooled data sets now available. Here we do that by asking whether the Kantian influences—trade, institutionalized democracy, and joint memberships in intergovernmental organizations (IGOs)—affect the likelihood of militarized interstate disputes, holding constant the influence of past conflicts. Answers to this question, when interpreted in the light of theory, give us insight into the causal forces shaping interstate relations. This is important if we are to recommend that policymakers promote democracy and trade internationally and participate in international organizations as a means of promoting world peace.

Previous research is not conclusive on this point. It is likely that there are important reciprocal relations linking the Kantian influences (and some realist variables) and the probability of interstate violence. A history of conflict may cause a nation to restrict personal liberties or even suspend democracy, becoming a “garrison state” (Lasswell, 1941). Similarly, states’ willingness to participate in IGOs with others may depend on the tenor of their relations. They may share membership in many IGOs only when they have a history of peace, and these shared associations may have no causal influence on their future relations. The problem of reciprocal causation is most evident, however, when we consider interdependence and peace (Reuveny, 2000; Jervis, 2002; Levy, 2002). Indeed, Kant and other classical liberals expected that economically important commerce would constrain states from resorting to force precisely because their interdependent relations would be threatened.

To clarify the causal effects of democracy, interdependence, and intergovernmental organizations on dyadic conflict, we use regression analyses that incorporate distributed lags of important liberal and realist variables as well as a dyad’s history of conflict. These tests are in the spirit of Granger’s test of causality. Granger (1969) proposed that a variable X might be a cause of Y if past values of X can be used to predict Y more accurately than using past values of Y alone. Using data for the period 1885–1992 regarding nearly 10,000 pairs of states, we show that past values of the Kantian influences do allow a better prediction of the current likelihood of a dyadic dispute than the history of their militarized disputes and other controls alone. We also use information in our pooled time series to address other questions regarding the dynamics of interstate relations. We find no evidence that
democratization increases the danger of military conflict (Mansfield and Snyder, 1995, 1996, 2002); nor can we confirm that expectations regarding future economic relations, as indicated by the trend in previous commercial relations, affect the prospects for peace (Copeland, 1996, 2000). Finally, we incorporate distributed lags into the gravity model of trade (Tinbergen, 1962; Helpman and Krugman, 1985; Deardorff, 1995) to show that militarized disputes do adversely affect bilateral commerce.

### The Kantian Peace

Previously we have estimated the probability of a dyadic dispute, 1885–1992, as a function of several liberal and realist influences (Russett and Oneal, 2001): the character of states’ political regimes, the economic importance of their bilateral trade, the number of IGOs in which they share membership, whether the states were allied, and the bilateral balance of power. We controlled for contiguity, the distance separating the two states, and whether the dyad includes a major power. Strong support for liberal theory emerged. The annual probability of a militarized interstate dispute falls by 33 percent, *ceteris paribus*, if the level of democracy in the less democratic state in the dyad—the state less constrained politically—is one standard deviation greater than the average. The probability of a dispute drops by 43 percent if both states are economically dependent on their commercial relations. A dense network of IGOs is associated with a 24 percent reduction in conflict. If all three Kantian influences are increased simultaneously, the probability of a dispute drops 71 percent.

This support for the democratic peace and the constraining influence of economically important trade is consistent with other recent research (Hegre, 2000; Mousseau, 2000; Crescenzi and Enterline, 2001; Gartzke, Li, and Boehmer, 2001; King and Zeng, 2001; McDonald, 2001; Gleditsch, 2002; Heagerty, Ward, and Gleditsch, 2002; Beck, 2003; Lagazio and Russett, 2003; Mousseau, Hegre, and Oneal, 2003).\(^1\) Bennett and Stam (2000) provide an especially valuable, independent assessment of the Kantian peace. They use alternative estimators and control for several other influences thought to affect the incidence of dyadic conflict. Their tests include an indicator that conflict is likely based on the model of strategic behavior proposed by Bueno de Mesquita and Lalman (1992), widely considered the most sophisticated game-theoretic account of interstate conflict. Bennett and Stam’s analyses of nondirected dyads are consistent with the democratic peace in all twelve tests.\(^2\) Economic interdependence is significantly related to peaceful relations in nine of the twelve: the same number as the indicator of whether a dyad includes a major power and more than any other theoretically interesting variable except democracy. Joint membership in IGOs is not statistically significant in any test, but evidence for the pacific benefits of IGOs is greater when the increasing trend in the number of international organizations is factored out (Oneal and Russett, 1999b; see also Mansfield and Pevehouse, 2000).

---

\(^1\) Chan (1997), Ray (1998), and Russett and Starr (2000) survey research on the democratic peace. McMillan (1997), Copeland (2000), Mansfield and Pollins (2001, 2003), and Schneider, Barberi, and Gleditsch (2003) provide useful reviews of the growing literature on interdependence and conflict. The contribution of international organizations, on the other hand, has not been widely examined; and the results are less consistent.

\(^2\) Tests using nondirected dyads do not attempt to predict which state in a dyad will initiate conflict. We prefer this approach because we are primarily interested in identifying dyads that are prone to violence—and the factors that make them dangerous—so policies can be adopted to improve the prospects of peace. Some questions derived from rational choice theory require directed analyses, but tactical considerations may lead even a weak state to act preemptively when it knows that the probability of conflict is high. Unfortunately, we lack data on terrain, lapses in preparedness, etc., that influence this decision.
Accounting for Reciprocal Relations

If our analyses are to be relevant to policymakers, we must be as sure as science allows that the Kantian influences cause a reduction in interstate conflict. Of course, as Hume cautioned, we can never establish causal relations beyond doubt; but we must do what we can to guard against the possibility that causality runs only from peace to the Kantian factors, or that the correlations are spurious because of the influence of some third factor. Indeed, as noted earlier, it is likely that there are important reciprocal relations among democracy, interdependence, and involvement in IGOs on the one hand and peace on the other. Interdependence and conflict in particular are apt to be endogenously determined. Entrepreneurs establish commercial relations when they believe that their goods or their lives will not be endangered. If there is significant threat of conflict, they will at least seek a greater margin of profit or more complete insurance coverage to compensate for the risk; but these actions raise costs and lower demand, reducing commerce. Thus, Jervis (2002) cautions in his recent presidential address to the American Political Science Association that interdependence may be more an effect than a cause of cooperation and peace.

Realists generally argue that politics determines trade, or that “trade follows the flag,” rather than trade affecting politics (Levy, 2002). Pollins (1989a, 1989b) and Gowa and Mansfield (1993) report that security interests do influence commercial ties. States often restrict trade with potential adversaries out of concern for the relative gains from trade. They cannot consider only the absolute benefits of commerce because another state’s incremental advantage may have military significance (Grieco, 1998). Consequently, governments routinely limit sales of goods that are considered strategic: key raw materials or technological products with military applications. The United States imposed many restrictions on East–West trade during the Cold War, and it retains significant limitations with many states today. Although commerce between states in times of war was not uncommon in earlier centuries (Barbieri and Levy, 1999), modern states are more effective in limiting such activity. States may also act to increase their interdependence with trading partners with which they have good political relations (Krasner, 1978). Gowa (1994) and Mansfield and Bronson (1997a, 1997b) report that states trade more with allies than expected on purely economic grounds; but our analyses of the determinants of trade, reported below, suggest, as does the work of Morrow, Siverson, and Taberes (1998, 1999), that this relationship is not robust.

While states are reluctant to trade with a country that may become an adversary, most countries most of the time are not threatening one another. Then, it is the absolute gains accruing to the trading partners that primarily motivate their behavior (Snidal, 1991). Indeed, Morrow (1997) has shown analytically that relative gains should rarely impede trade. Nevertheless, the incentives for trade are greatest for countries that enjoy peaceful relations. In Powell’s (1991:1313) words, “If the use of force is no longer at issue, then a state’s relative loss will not be turned against the state. Relative gains no longer matter, and cooperation now becomes feasible.”

---

3 Most attention has been paid to the reciprocal relations of trade and conflict. James, Solberg, and Wolfson (1999, 2000) suggest that the peacefulness of democracies is really an indication that democracy thrives when states are at peace; but Raknerud and Hegre (1997), Mousseau and Shi (1999), Mitchell, Gates, and Hegre (1999), Oneal and Russett (2000), and Reiter (2001a) find that democracy reduces the likelihood of a dispute even when the reverse effect is considered. The early work of Wallace and Singer (1970) concludes that IGOs are formed in response to the end of major wars and are not important causes of peace; but Wallensteen (1984) concludes that they limit the frequency and intensity of subsequent conflict.

4 Barbieri and Levy (1999) consider some twentieth century cases; but the results are inconclusive, perhaps because they often include not just war years but many years after the war, during which trade may have rebounded. Anderton and Carter (2001) find that wars, involving both major powers and non–major powers, commonly disrupt trade.
In addition, gains from trade increase each state’s security vis-à-vis hostile third parties. Because trade and conflict are likely to affect each other, studies that neglect this interaction may be misspecified. Thus, “simultaneity and dynamic modeling ought to become routine features of future studies” (Reuveny, 2000:37). Several efforts have been made in the past to address this issue. Mansfield (1994) estimated a system of two simultaneous equations, one predicting the level of global trade and the other the number of wars in the international system. Early dyadic investigations (Polachek, 1980, 1997) employed two-stage and three-stage least squares regression analysis in recognition of the reciprocal relation between trade and conflict.

Recently, Kim (1998) used simultaneous equations to disentangle the reciprocal relations between bilateral trade and dyadic interstate conflict, 1950–92. Her work is important because she has a large number of cases and considers only militarized disputes and war, not political tensions. She concludes that the effect of trade on conflict is greater than the effect of conflict on trade.

Beck, Katz, and Tucker (1998) propose a solution for duration dependence in time series that controls for the effect of past conflict on interstate relations. They suggest estimating the effects of theoretically interesting variables while controlling for the length of time that has elapsed since a dyad’s last dispute. With this technique, they confirmed that democracy has important peace benefits but found that the bilateral trade-to-GDP ratio was no longer significantly related to a reduced probability of conflict. Since then, it has been demonstrated that, with more complete data or a variety of alternative specifications, the benefits of economically important trade are statistically significant and substantively important even with the peace-years correction (Oneal and Russett, 1999a, 1999b, 2003; Bennett and Stam, 2000; Hegre, 2000; Mousseau, 2000; Gartzke, Li, and Boehmer, 2001; King and Zeng, 2001; McDonald, 2001; Heagerty, Ward, and Gleditsch, 2002; Beck, 2003; Mousseau, Hegre, and Oneal, 2003; Oneal, 2003).

Most previous efforts to estimate a system of structural equations for trade and conflict have been limited to specifications that include only contemporaneous terms, implying that conflict in a particular year affects trade in the same year only and vice versa. It seems more likely that the occurrence of a militarized dispute in one year will affect decisions by investors and traders for some years into the future. This is Beck et al.’s (1998) insight. But important commercial relations, too, may have a long-term effect: the likelihood of conflict may be lower for a dyad with a history of close economic ties, even if it were recently involved in a dispute, than if the two states had never been interdependent. Controlling for the years of peace does not allow for this possibility. It assumes that the number of years elapsed since the last dispute is independent of the influences of the theoretical variables included in the regression analysis (Beck and Tucker, 1996). Rather, the years of peace that a dyad has enjoyed are apt to be a function of the past character of the states’ political systems, the level of trade, and so on. Such theoretical considerations must guide our efforts to resolve the problem of endogeneity (Bennett, 1999).

A distributed-lags model is another method for addressing reciprocal effects in the analysis of interstate conflict. Using Granger’s (1969) logic, democracy, economically important trade, and so on can plausibly be considered causes of peace if their past values can be used to predict the current likelihood of a dispute more accurately than using dyads’ histories of disputes alone. Statistical tests establish whether the explanatory variables precede the occurrence of disputes; but theory must provide the causal link. A distributed-lags model has several advantages over alternative methods. First, it allows a dispute to affect the likelihood of future conflict over a period of years. Second, it controls for temporal dependence in a manner that is substantially richer and more complete than a count of the time elapsed since the last dispute. In estimating the current likelihood
of conflict, it can distinguish, for example, between a dyad that enjoyed an extended period of peace and then experienced a military dispute from a pair of states that had disputes over many years. Third, it allows the past values of the variables of theoretical interest to influence the current likelihood of conflict. Thus, long-term benefits of interdependence, and so forth that ameliorate the harmful effects of a recent conflict can be detected. Fourth, it is robust to misspecification. The lagged indicators of dyads’ involvement in militarized disputes act as proxies for explanatory variables omitted from the regression equation, providing some protection against accepting a spurious correlation as evidence of a causal relation (Burkhart and Lewis-Beck, 1994). Finally, it is easy to implement and interpret.

Despite these advantages, few studies have employed models with distributed lags or used related statistical techniques. Gasiorowski and Polachek (1982) looked at political conflict and cooperation between the United States and the Warsaw Pact using Granger tests; Reuveny and Kang (1996, 1998) used vector autoregression analysis of the political relations of a small number of dyads, and Reuveny (2001) estimated a complex model of conflict and trade among four countries that included distributed lags. Gasiorowski and Polachek found that trade reduces the incidence of conflict, independent of past levels of violence; the results of Reuveny and Kang and of Reuveny are mixed. Unlike these authors, we focus on militarized interstate disputes, not political conflict of a nonviolent nature, and employ the technique of lagged variables over a much longer period and for many more dyads.

**Historical Domain, Definitions of Variables, and Sources of Data**

We analyze dyadic interstate behavior, 1885–1992, for all dyads for which data are available, as Lemke and Reed (2001) and Bearce and Fisher (2002) recommend. All but the first years of World Wars I and II are omitted because bilateral trade data are fragmentary, as they are for the immediate postwar years, 1919–20 and 1946–49. Omitting all but the first year of the world wars provides assurance that our results are not determined by these dramatic but atypical events (Farber and Gowa, 1997). Our variables and data are similar to those used in Russett and Oneal (2001), which can be consulted for additional information.

**Militarized Interstate Disputes and Fatal Disputes**

The Correlates of War (COW) project has assembled information regarding militarized interstate disputes, 1816–1992 (Jones, Bremer, and Singer, 1996). Maoz (1999) notes, however, that individual states on one side of a multilateral contest may never have threatened, displayed, or used force against particular states on the opposing side. For example, Bulgaria and Japan were on opposite sides in World War I, but there is no evidence that they actually engaged one another. Maoz has corrected this problem and others to produce more accurate dyadic data, which we use. We analyze the onset of militarized disputes. ONSET equals 1 in the first year of a dispute in which either state threatened to use force, made a demonstration of its military capabilities, or actually used force against the other; it equals 0 otherwise.

We also consider the onset of fatal disputes, conflicts in which at least one member of the armed forces of the parties to the conflict died. Focusing on these particularly violent conflicts serves two purposes. First, it reduces bias in the reporting of less severe military incidents. The use of force at even a low level in Western Europe, for example, small arms’ fire across an international border, would certainly be reported in the Western media from which the COW data are primarily gleaned; such incidents in Africa are apt often to go unnoticed. Attention to fatal disputes also ensures that our analyses are relevant to the violent interstate conflict of greatest concern. FATAL equals 1 in the first year in which a dyad was
involved in a dispute that involved at least one military fatality; it equals zero otherwise. ONSET and FATAL are the variables to be explained in our analyses of interstate violence; in our examination of the reciprocal influence of conflict on trade, they enter on the right-hand side of the regression equation.

Democracy

We use the Polity III data (Jaggers and Gurr, 1995, 1996) to compute a summary measure of the political character of regimes \((\text{DEM}_i)\), subtracting from each country’s score on the democracy scale its score on the autocracy scale. Because a dispute can result from the actions of a single state, the likelihood of conflict should primarily be a function of the freedom of action enjoyed by the less constrained state in each dyad. Politically, this is the less democratic state \((\text{DEM}_L)\): the more democratic this state, the more constrained it is from using force, and the more peaceful the dyad will be. This specification effectively distinguishes a democratic dyad from those that contain one or two autocracies.\(^5\) In analyzing the determinants of trade, we consider whether democratic dyads trade more with one another than do mixed or autocratic pairs.

Trade and Economic Interdependence

For the post–World War II era, we use new data created by Gleditsch (2002). He has supplemented the IMF’s Direction of Trade statistics and the GDP data in the Penn World Tables with information from additional sources. There are two important advantages to using these data. First, they include observations from within the Soviet bloc during the Cold War—cases absent from the IMF data. Second, Gleditsch has been able to find values for most of the other missing data and, where values are still unknown, there is good reason to believe that no trade existed.\(^6\) For the years before 1950, we rely primarily on the data regarding bilateral trade compiled by the League of Nations for the interwar period and The Statesman’s Yearbook for the pre–World War I era. Maddison (1995) provides GDPs for 56 countries in all regions of the world for 1870–1992. We used these with information on energy consumption (Singer and Small, 1995) to estimate missing GDP data. As a result, we have information on trade and economic size for 61 percent of the dyads in the years 1885–1913 and 1920–1938.

We divide the sum of a country’s exports and imports with its partner by its GDP to create a measure of the economic dependence of the country on these commercial relations \((\text{DEPEND}_i)\). Trade is expected to restrain policymakers from using force only if it is economically (and therefore politically) important. Again, we expect the likelihood of a dispute to be primarily a function of the freedom of the less constrained state. This is indicated by the bilateral trade-to-GDP ratio of the state less dependent on trade with its dyadic partner \((\text{DEPEND}_L)\). Consistent with previous research, we use the natural logarithm of the trade between states \(i\) and \(j\) (\(\text{lnTRADE}\)) and the sum of the logarithms of their GDPs (\(\text{lnGDP}\)) when testing for the reciprocal effect of conflict on commerce. Data regarding the population of nations (\(\text{lnPOPULATION}\)), also used in the gravity model of trade, are from the Correlates of War project (Singer and Small, 1995).

\(^5\) The evidence for the democratic peace is also clear if the political character of both states is considered (Oneal and Russett, 1997; Peceny and Beer, with Sanchez-Terry, 2002; Bennett, 2002; cf. Henderson, 2002).

\(^6\) Thus, the debate regarding missing values of trade in the Direction of Trade is, for practical purposes, eliminated (Oneal and Russett, 1999a).
Joint IGO Memberships

We assess the influence of international organizations on interstate conflict by counting the number of intergovernmental organizations, reported in the *Yearbook of International Organizations*, in which both states in a dyad share membership. This is by no means a perfect measure of the effectiveness of international organizations because it includes organizations that are weak and strong, regional and global, functional and multipurpose. Ideally, the total should be broken down and some organizations given special weight, but this effort is only beginning (Boehmer, Gartzke, and Nordstrom, 2000). Consequently, we use the simple count of joint memberships; but to eliminate the strong rising trend in the number of international organizations, we calculated states’ involvement in international organizations relative to the yearly average for all states.7 This variable (IGO) is included in both the conflict and trade equations.

Capability Ratio

Realists emphasize the importance of the balance of power in interstate relations. Recent empirical work suggests that a preponderance of power deters military action (Bremer, 1992, 1993; Lemke and Kugler, 1996; Russett and Oneal, 2001). Our index of relative power (CAPRATIO) is the natural logarithm of the ratio of the stronger state’s military capability index to that of the weaker member. We use the COW project’s data (Singer and Small, 1995) on population, industry, and military forces to calculate nations’ military capabilities.

Alliance

Allies are thought to fight each other less than other states, and trade with one another more, because they share security concerns and other political and economic interests. We control for this influence using a variable (ALLIES) that equals 1 if the members of a dyad were linked by a mutual defense treaty, neutrality pact, or entente; it equals 0 otherwise. Singer’s (1995) compilation of alliances was updated using Rengger with Campbell (1995).

Contiguity and Distance

A potential for violence exists when at least one member of a dyad can reach the other with militarily effective force. For most states, that ability derives from geographic proximity. Furthermore, neighbors are likely to have the most reasons to fight—over territorial boundaries, natural resources, irredentism, and so forth. Thus, distance reduces both the capability to fight and the incentives to do so. Geographic proximity also affects the level of bilateral trade, of course. Because of the importance of this influence in both regards, we include two different terms in the conflict and trade equations to capture its effect as fully as possible. DISTANCE is the natural logarithm of the great circle distance in miles between the two states’ capitals (or major ports for the largest countries). We also include NONCONTIG, which equals 1 if two states are not directly or indirectly contiguous (via colonies or other dependencies), and 0 if they share a land border or are separated by less than 150 miles of water. Because of widespread colonial empires for much of the period, these two measures are not highly correlated (r = .67). The effect of distance in constraining conflict, however, is less for the Great Powers, which can deliver substantial forces or destructive power globally. The major powers have been identified by the COW project based on the consensus of historians. As an

---

7 IGO equals the number of a dyad’s joint memberships minus the annual average for all dyads divided by the yearly standard deviation of all dyads’ joint memberships.
additional control, then, we add MINORPWRS, coded 1 if a dyad is composed of minor powers and 0 for pairs that include at least one major power.

The Kantian Influences Reduce Interstate Conflict

In this section we report our distributed-lags analyses of the onset of militarized disputes. We use logistic regression analysis, because our measures of interstate conflict are dichotomous, and report robust standard errors that take into account the clustering of our data by dyads (StataCorp, 1999). We begin with our model of fatal disputes:

\[
FATAL_{ijt} = \text{DEML}_{t-1} + \ldots + \text{DEML}_{t-7} + \text{DEPENDL}_{t-1} + \ldots + \text{DEPENDL}_{t-7} + \text{IGO}_{ijt} + \ldots + \text{IGO}_{ijt-7} + \text{CAPRATIO}_{ijt-1} + \ldots + \text{CAPRATIO}_{ijt-7} + \text{ALLIES}_{ijt-1} + \ldots + \text{ALLIES}_{ijt-7} + \text{NONCONTIG}_{ijt-1} + \text{DISTANCE}_{ijt-1} + \text{MINORPWRS}_{ijt-1} + FATAL_{ijt-1} + \ldots + FATAL_{ijt-7}
\]

(1)

We account for the onset of a fatal dispute for a pair of states in year \( t \) using seven lagged values of each of the main liberal and realist variables. Their influences are estimated while controlling for the history of dyadic disputes over the same period, whether the two states shared a border (either directly or through a dependency), the distance separating them, and whether the dyad was composed of only minor powers. The last three variables are considered strictly exogenous, so only one value is included. For the other variables, the number of lags to include was determined by adding terms until additional lags of FATAL were no longer statistically significant. In this way, we seek to ensure that we have thoroughly controlled for the influence of past disputes on the current likelihood of conflict, while minimizing the loss of observations from additional lags. If the other variables still contribute to the explanation of interstate violence, the causal relation posited by liberal or realist theory is corroborated. Adding terms until they become insignificant is a simple method appropriate for both dichotomous and continuous dependent variables (Becketti, 1992; see also UNCTAD, 1999). More elaborate statistical tests for determining the optimal number of lags are not available for logistic analysis. In any event, our results are not sensitive to the number of lags included.

The results of estimating equation (1) are reported in Table 1. Instead of giving the coefficients for all the individual terms, we report the sum of the seven coefficients for \( \text{DEML}_t \), \( \text{DEPENDL}_t \), etc.; the chi\(^2\) statistic for each of these sets of variables; and the probability that the individual coefficients are jointly insignificant. The sum of the coefficients indicates the net effect of a variable if its value remained constant over the seven-year period; the probability associated with the chi\(^2\) statistic is the likelihood that this effect is zero. The coefficient, standard error, and probability associated with the Wald test are reported for the strictly exogenous variables.

Column 1 shows the results for the analysis of fatal disputes. Notably, the sums of the coefficients of each of the Kantian variables—\( \text{DEML}_t \), \( \text{DEPENDL}_t \), and \( \text{IGO} \)—are negative, indicating that higher levels of democracy, interdependence, and involvement in international organizations reduce the likelihood of interstate conflict. Joint memberships in intergovernmental organizations are more closely associated with peace here than in previous research. Moreover, this greater statistical significance is reflected in a much larger substantive effect, as will be seen. All the variables in the model—liberal and realist—are statistically significant at the .001 level except for the trade-to-GDP ratio (\( p < .02 \)) and the indicator of an alliance. Surprisingly, allies are not less likely to fight than non-allies (\( p < .59 \)); indeed, the sum of the coefficients is positive. A preponderance of power, indicated by a large capability ratio, lowers the incidence of conflict. As expected, a history of
disputes increases the likelihood of a fatal conflict in the current year. States that do not share a border or are distant from one another are more peaceful, as are minor powers. These results are robust with regard to the number of lags included in the estimation.  

We estimated equation (1) using 1, 2, ..., 14, and 15 lags to assess the robustness of our results. The absolute value of the sum of the coefficients for DEPENDL initially declined as lags were added, stabilized after 6 lags, and rose again with 12–15 lags. The sum of the coefficients for the model with seven lags (−31.4), reported in Table 1, can be compared to the average value for the specifications with 7 through 15 lags (−32.5). The estimated coefficients of DEPL were jointly significant at the .001 level at all lag lengths from 1 through 15 except for seven, when $p < .02$ as shown in Table 1. The sum of the coefficients for the lower democracy score with seven lags is −0.111, which is somewhat smaller than its average for 7–15 lags (−0.140). The sum of the coefficients for IGO in Table 1 is −0.150; its average for 7–15 lags is −0.111. These analyses are posted with our data. The results are similar if the analysis is limited to the politically relevant dyads, though significance levels for DEPL are lower. The average value for the sum of its coefficients with 7 through 15 lags is −33.8, but the coefficients are not jointly significant at the .10 level in three of these tests.

---

### Table 1. Distributed-Lags Models of the Onset of Militarized Interstate Disputes, 1885–1992

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fatal MIDs</th>
<th>All Onsets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democracy Score$_L$</td>
<td>Sum of $\beta$s $\hat{p}$</td>
<td>$-0.111$ $0.001$</td>
</tr>
<tr>
<td></td>
<td>Chi2</td>
<td>$79.0$</td>
</tr>
<tr>
<td>Trade-to-GDP Ratio$_L$</td>
<td>$-31.4$ $0.02$</td>
<td>$-20.2$ $0.001$</td>
</tr>
<tr>
<td>Joint Memberships in IGOs</td>
<td>$-0.150$ $0.001$</td>
<td>$-0.0663$ $0.001$</td>
</tr>
<tr>
<td>Allies</td>
<td>$0.00562$ $0.59$</td>
<td>$0.0248$ $0.001$</td>
</tr>
<tr>
<td>Capability Ratio (log)</td>
<td>$-0.341$ $0.001$</td>
<td>$-0.101$ $0.001$</td>
</tr>
<tr>
<td>Previous Dispute</td>
<td>$10.4$ $0.001$</td>
<td>$6.28$ $0.001$</td>
</tr>
<tr>
<td>Not Contiguous</td>
<td>$-1.73$ $0.081$</td>
<td>$-1.78$ $0.053$</td>
</tr>
<tr>
<td></td>
<td>SE$_{\hat{p}}$</td>
<td>$0.25$ $0.001$</td>
</tr>
<tr>
<td>Distance (log)</td>
<td>$-0.562$ $0.001$</td>
<td>$-0.565$ $0.001$</td>
</tr>
<tr>
<td>Both Minor Powers</td>
<td>$-1.98$ $0.001$</td>
<td>$-1.78$ $0.001$</td>
</tr>
<tr>
<td>Constant</td>
<td>$-3.77$ $0.001$</td>
<td>$-2.46$ $0.001$</td>
</tr>
<tr>
<td>Wald Chi$^2$</td>
<td>$1748.6$ $(45 \text{ df})$</td>
<td>$4224.3$ $(39 \text{ df})$</td>
</tr>
<tr>
<td>$p$ of Chi$^2$</td>
<td>.0001</td>
<td>.0001</td>
</tr>
<tr>
<td>Log likelihood</td>
<td>$-1250.9$</td>
<td>$-4199.6$</td>
</tr>
<tr>
<td>Pseudo-$R^2$</td>
<td>$0.27$</td>
<td>$0.34$</td>
</tr>
<tr>
<td>N</td>
<td>$231,618$</td>
<td>$245,120$</td>
</tr>
</tbody>
</table>
The results in the second column of Table 1 for the onset of all disputes (not just those with fatalities) are very similar, at least for liberal theory. Six lagged values were sufficient to account for the influence of past disputes on the current likelihood of conflict. The coefficients of most of the theoretical terms are smaller, but all except the capability ratio ($p < .04$) are significant at the .001 level. The surprising result here is that allied states again have a greater incidence of disputes than do non-allied states, and now this result is very significant statistically ($p < .001$).

Alliances evidently produce not just bonds of security, but grounds for disagreement about institutions, decision-making procedures, burden-sharing, and strategy. They constrain the use of force in many cases but also create “salience and/ or the ease of interaction” (Siverson and Starr, 1991:93; see also Bueno de Mesquita, 1982; Kinsella and Russett, 2002). An alliance with a major power is especially dangerous (Oneal and Russett, 1997, 1999a). Great Powers may use force against smaller allies to enforce their spheres of influence. The pacifying effect of being allied also varies over time. It was stronger during the Cold War than in the years before World War II; its effect was particularly uncertain in the inter-war years, 1920–1939 (Russett and Oneal, 2001). Bennett and Stam (2000) also report substantial variation in the consequences of an alliance. Allies are significantly less likely to fight in only two of their twelve tests for nondirected dyads.

We can make our results more concrete by estimating the effect each theoretical variable has on the likelihood that a militarized dispute will begin. First, we calculated a baseline probability against which to make comparisons. We assumed that the dyad had not had a dispute in the period represented in the lagged terms (seven years for fatal disputes, six years in the analysis of all disputes), and we set all the lags of each of the continuous variables at the same relatively low level, the value taken by a dyad at the tenth percentile among the contiguous pairs of states. We postulated that the members of the dyad shared a border, were not allied, and were not major powers. The distance between their capitals was set at the mean for the contiguous pairs. We estimated the annual probability of the onset of a fatal militarized dispute for this dyad using the coefficients in Table 1. To show the substantive effects of the theoretically interesting variables, we increased each set of lagged terms, one set at a time, to the value taken by a dyad at the ninetieth percentile among the contiguous pairs of states. We postulated that the members of the dyad shared a border, were not allied, and were not major powers. The distance between their capitals was set at the mean for the contiguous pairs. We estimated the annual probability of the onset of a fatal militarized dispute for this dyad using the coefficients in Table 1. To show the substantive effects of the theoretically interesting variables, we increased each set of lagged terms, one set at a time, to the value taken by a dyad at the ninetieth percentile among the contiguous dyads, or we made the states allies. We report the probabilities of a dispute under each of these conditions and the reduction in risk relative to the baseline in Table 2.

As seen in the first column of Table 2, the baseline probability for the onset of a fatal dispute is .0086. Increasing the lower democracy score reduces this enormously—by 86 percent. Raising the bilateral trade-to-GDP ratio, while holding all other variables at their baseline values, lowers the probability of a dispute to .0058, a reduction of 32 percent. An increase in the dyad’s involvement in IGOs from the tenth to the ninetieth percentile causes the likelihood of conflict to drop by 43 percent. Making the states allied has little effect—an increase of 1 percent. Increasing the preponderance of the more powerful state lowers the risk of a fatal dispute by 71 percent, but this must be interpreted with caution. To go from the tenth to the ninetieth percentile means increasing the superiority of the more powerful state from 1.3:1 to 50.7:1. Such an increase is clearly beyond the capacity of most states even in the long term, especially because the capability ratio is calculated using the population and industry of states as well as military measures.

Just as the significance levels for the onset of all disputes are not much different from those for fatal disputes, the changes in probabilities in column 2 are similar to those in column 1. The effect of a predominance of power is notably reduced, but still important. The impacts of democracy and interdependence are also lower but continue to be substantial. The effect of sharing common memberships in international organizations is equal to that of trade.
Several authors (Fearon, 1994; Smith, 1998; Gartzke, Li, and Boehmer, 2001; Schultz, 2002) propose that the ability to signal their intentions accounts for the separate peace among liberal states. Democracies and interdependent states may benefit from being able to communicate their preferences by sending costly signals. Transparency, when coupled with support for a show of strength from the domestic opposition, allows these states to persuade adversaries of their resolve and thus to prevail without actually having to fight. Similarly, Boehmer, Gartzke, and Nordstrom (2000) argue that states joined in well-institutionalized IGOs can use those organizations to exchange information and credibly communicate resolve. Our empirical results fit such signaling hypotheses to a degree: democracies, interdependent states, and states in a dense network of IGOs are even less likely to have a fatal dispute than a less violent one. But since these states experience low-level MIDS less frequently than do other states, their signaling must take place primarily in political and diplomatic communications without the threat of military force. 9 Our results are also consistent with other theories of the liberal peace that emphasize the roles played by material interests and norms in allowing interdependent democracies joined in many international organizations to avoid conflict.

This discussion of the independent effects of democracy, interdependence, and IGOs understates the benefits of Kant’s prescription for peace because these elements of the liberals’ political and economic program are integrally related. The leaders of democratic states are constrained from resorting to force against other democracies; but democracy, by encouraging individual liberty and responsibility, fosters entrepreneurship and the expansion of commerce beyond a nation’s boundaries. As the economic activities of citizens make countries interdependent, international law and organizations are needed to regulate and facilitate commerce. Thus, there is a logical sequence that links the freedom of citizens in democratic states to expanding commerce over a widening geographical area and the growth of international institutions. It is appropriate, therefore, to estimate the effect of

---

9 Kinsella and Russett (2002) report, however, that even nonviolent diplomatic disputes are less common in democratic and interdependent dyads.

### Table 2. Annual Probabilities of the Onset of a Militarized Dispute, 1885–1992, Based on the Estimated Coefficients in Table 1

<table>
<thead>
<tr>
<th></th>
<th>Fatal MIDs</th>
<th></th>
<th>All Onsets</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>( p )</td>
<td>Change</td>
<td>( p )</td>
<td>Change</td>
</tr>
<tr>
<td>1. Democracy Score(_L), Trade-to-GDP Ratio(_L), IGOs, and Capability Ratio set at 10th percentile for contiguous dyads; Allies equals 0; Distance at mean for contiguous dyads; no disputes in previous 16 years</td>
<td>( .0086 )</td>
<td>0</td>
<td>( .020 )</td>
<td>0</td>
</tr>
<tr>
<td>2. Increase in Democracy(_L) to 90th percentile; other variables at baseline values</td>
<td>( .0012 )</td>
<td>(-86%)</td>
<td>( .007 )</td>
<td>(-66%)</td>
</tr>
<tr>
<td>3. Increase in Trade-to-GDP Ratio(_L) to 90th percentile; other variables at baseline values</td>
<td>( .0058 )</td>
<td>(-32%)</td>
<td>( .016 )</td>
<td>(-22%)</td>
</tr>
<tr>
<td>4. Increase in IGOs to 90th percentile; other variables at baseline values</td>
<td>( .0049 )</td>
<td>(-43%)</td>
<td>( .016 )</td>
<td>(-22%)</td>
</tr>
<tr>
<td>5. Allies equals 1; other variables at baseline values</td>
<td>( .0086 )</td>
<td>(+01%)</td>
<td>( .021 )</td>
<td>(+03%)</td>
</tr>
<tr>
<td>6. Increase in Capability Ratio to 90th percentile; other variables at baseline values</td>
<td>( .0025 )</td>
<td>(-71%)</td>
<td>( .014 )</td>
<td>(-30%)</td>
</tr>
<tr>
<td>7. Increase in Democracy(_L), Trade-to-GDP Ratio, Sum IGOs to 90th percentile; other variables at baseline values</td>
<td>( .0004 )</td>
<td>(-95%)</td>
<td>( .003 )</td>
<td>(-79%)</td>
</tr>
</tbody>
</table>
increasing all three Kantian factors simultaneously. Then, the incidence of fatal disputes falls by 95 percent, from .0086 per annum to .0004.

The substantive importance of the Kantian variables can also be illustrated by considering contemporary relations between the United States and China. At a time when many are concerned about the growing power of the Chinese, our results indicate that the probability of war has declined dramatically in recent decades. To illustrate this, we estimated the probability of a fatal militarized dispute in 2002 assuming that the political character of the Chinese government had remained unchanged since the start of the Chinese cultural revolution, when it was at its most autocratic, and relations between the two countries had not improved. In the mid-1960s, there was virtually no bilateral trade between the two countries and only limited contact in international organizations. In 2001, U.S.–China trade actually made up 1.20 percent of the U.S. gross domestic product, nearly the 90th percentile in our data. As a result of this growth in commerce, the probability of a fatal militarized dispute was 27 percent lower in 2002 than it would have been if the dyad’s commercial relations had not improved. With greater contact between the two countries in IGOs, we estimate a reduction in risk of 28 percent. Even the slight moderation in the authoritarian character of the Chinese government, from −9 to −7 on our democracy scale, lowers the likelihood of conflict 17 percent below what it would have been if there had been no change since the mid-1960s. The combined effect of the three Kantian influences is dramatic: a 58 percent reduction in risk. According to our analysis, increased trade, greater contact in international organizations, and some moderation in the authoritarian character of the Chinese government reduced the probability of a fatal militarized dispute between these major powers from 1.9 percent to 0.8 percent.

Additional Analyses of the Dynamics of Interstate Relations

We next consider additional analyses to illustrate the dynamic effects of democracy and interdependence. In the results we have reported thus far, we changed all the lagged values of a theoretical variable by the same amount to show the long-term effect on the probability of conflict. We can take advantage of the information in the time series to evaluate two theories that predict how change through time affects the prospects for peace: Mansfield and Snyder’s (1995, 1996, 2002; Snyder, 2000) concern about democratization and Copeland’s (1996, 2000) argument that expectations about future levels of interdependence condition the effect of trade.

Democratization

The turbulent political changes associated with the end of the Cold War and the wave of democratization in Eastern Europe and the former Soviet Union led some to fear new international conflict fuelled by domestic instability. International relations scholars have long asked whether internal unrest increases the likelihood of external violence, but Mansfield and Snyder (1995, 1996, 2002; Snyder, 2000) offered new reason to consider the diversionary theory of war. Countries in transition to democracy may be conflict prone, they suggest, because nationalism becomes a rallying theme for demagogues seeking political support. Xenophobia

---

10 It is obvious that the U.S. and China are joint members of more IGOs in 2002 than they were in the early 1990s when our data end. The World Trade Organization is only the most notable example. Lacking current data regarding IGOs, we estimated the two countries’ joint memberships in 2001 (to predict the probability of conflict in 2002) by assuming that the growth in their contacts in the 1990s was equal to the growth during the 1980s. By this calculation, the U.S. and China are currently at about the 60th percentile among the dyads in our data. We estimated the capability ratio in 2001 using a variety of sources; and in estimating the probability of conflict in 2002 we included in the history of dyadic relations a fatal dispute in 2001, when a Chinese pilot was killed while challenging a U.S. plane off the coast of China.
and jingoism may be effective when a populace is inexperienced in democratic processes. Dramatic changes in government often do occur at times of social and economic turmoil; and a domestic crisis might encourage a new regime to pick a quarrel with another state in order to solidify support at home. It is also plausible that democratization would produce instability that tempts neighboring states to initiate conflict. Still, it is not obvious that new democracies, because they are apt to be unstable, should be prone to conflict. The opposite possibility also exists: new democratic governments may be afraid to initiate military action, because they are weak domestically, and may try to avoid conflict by adopting conciliatory policies toward their neighbors.

We can ascertain the effects of democratization on the likelihood of conflict using the analyses reported in Table 1. The historical dynamics of government, that is, the character of the less democratic state in each dyad through time, affect the likelihood of a current dispute just as the history of conflict does. The question is: does a recent transition from autocracy to democracy increase the probability of a fatal militarized dispute? To determine the answer, we compare three probabilities of the onset of a fatal dispute: for a dyad composed of two democracies throughout the previous seven years, for a dyad that included at least one autocracy the entire period, and the average for five dyads whose less democratic state was an autocracy that became democratic in year $t - 1, t - 2, t - 3, t - 4, \text{ or } t - 5$. We use the average of these last five dyads to determine whether democratization increases the risk of conflict because the lagged measures of democracy are highly correlated. Consequently, the estimated coefficients of the individual terms should not be given too much weight.

The probability of a fatal dispute in year $t$ for a dyad containing an autocracy over the years $t - 1 \text{ to } t - 7$ is .0086 (Table 2). The average value for the dyads in which the less democratic state experienced a transition from autocracy to democracy sometime between $t - 1 \text{ and } t - 5$ is .0034, 60 percent less. Thus, democratization reduces the risk of conflict and does so quickly. A dyad containing a newly democratic state is more prone to fight than two well-established democracies, which have a probability of conflict of .0012; but only seven years of democratic governance are needed to achieve this reduction in fatal disputes. These results are consistent with other recent research (Oneal and Russett, 1997; Thompson and Tucker, 1997; Enterline, 1998a, 1998b; Maoz, 1998; Ward and Gleditsch, 1998; Gleditsch and Ward, 2000; Russett and Oneal, 2001), but not Mansfield and Snyder (2002). Examining the effect of “autocratization” is also instructive. If one of two democratic states in a dyad becomes autocratic between $t - 1 \text{ and } t - 5$, the average probability of a fatal dispute is .0069; this is much closer to the risk of conflict for a dyad containing an autocracy (.0086) than it is to the risk for a democratic pair (.0012). This confirms that it is the current political character of a state that primarily determines the prospects for a violent militarized dispute.

**Expectations Regarding Future Levels of Interdependence**

Copeland (1996, 2000) suggests that states’ expectations regarding their future economic relations are crucial in shaping the prospects for peace. If national leaders expect their commerce with another state to decline in the near future, there is little to be lost by resorting to force today. At the same time, the fear that one side may interrupt their mutually beneficial commerce may induce the other to resort to violence in an effort to prevent the loss (Hirschman, 1980 [1945][33]; Gilpin, 1977). Thus, Copeland concludes, interdependence “can be either peace-inducing or war-inducing depending on the expectations of future trade” (1996:7). The danger that one state will threaten to disrupt trade seems greatest when, due to great differences in economic size, the states are asymmetrically dependent upon
their commercial relations (McMillan, 1997). Then, the larger, more independent party can exercise its power by threatening economic sanctions.  

Copeland demonstrates the plausibility of his theory through case studies. The difficulty in testing it statistically is in creating a measure of the expectations of national leaders. One approach is to assume that they project past trends into the future. Indeed, we previously reported that the pacific benefits of interdependence are greatest when states have high and rising levels of economically important trade (Oneal and Russett, 1997). To test Copeland’s theory, therefore, we compare the probabilities of a fatal dispute for three dyads. For the first, the lower trade-to-GDP ratio is set at .0125, the 90th percentile for the contiguous pairs of states, throughout the seven-year period included in the distributed-lags model for fatal disputes. The second dyad starts with no trade in year \( t \), but the level of interdependence then rises in equal increments to the 90th percentile over time. The third dyad begins with a level of interdependence equal to .0250, twice the 90th percentile; but this falls smoothly over the next seven years to .0125.

Our tests do not indicate that expectations regarding the future, as indicated in the trend of states’ commercial relations, are important determinants of interstate violence. The probability of a fatal dispute for the pair of states that had a constant level of interdependence throughout the previous seven years is .0058, as shown in Table 2. It is .0061 for the pair that experienced increased trade over the past (suggestive of high expectations for the future) and .0055 for the dyad whose trade declined (suggesting low expectations). The differences among the three estimates are small and contrary to theoretical expectations.

**Analyzing the Determinants of Trade**

To explore the reciprocal relation of conflict and trade, we perform another distributed-lags analysis in which the dependent variable is the natural logarithm of bilateral trade (imports plus exports). In keeping with economists’ gravity model (Tinbergen, 1962; Deardorff, 1995), we do not express trade as a proportion of GDP but include the economic size of the two states among the independent variables. The other explanatory variables include previous levels of dyadic trade, the dyad’s history of militarized disputes, and most of the other variables from our previous analysis of interstate conflict (equation (1)): our measure of joint memberships in IGOs, the alliance indicator, the lower democracy score, distance, and contiguity. As noted earlier, there is good reason to believe that democracies will trade more with each other than do other dyads, as allies are generally expected to do. And many international organizations—most notably the European Union but also those in other regions, like the North American Free Trade Agreement and Mercosur, as well as quasi-universal organizations such as the IMF and the World Trade Organization—exist specifically to strengthen and deepen commercial relations among their members.

The logarithm of distance is a standard component of the gravity model, because shipping costs increase with distance but at a declining rate. Since even neighboring countries may have capitals far apart and states’ contiguous dependencies create additional opportunities for trade, our measure of contiguity is a useful additional measure of the possibility of low-cost trade (Frankel and Romer, 1999). Gravity models of trade typically include two measures of the size of nations. One is the size of their combined economies, so we take the logarithm of each state’s GDP and then add them (Deardorff, 1995; Helpman and Krugman, 1985: ch. 6). The other measure of size is the sum of the logarithms of the countries’ populations. If population increases and GDP is held constant, per capita income declines.

---

11 There is, however, no evidence that asymmetrical interdependence increases the risk of conflict (Oneal and Russett, 1999a, 1999b).
Consequently, larger populations should be associated with lower levels of trade controlling for GDP, because poorer countries trade less than wealthier ones \textit{ceteris paribus}. First we analyze the effect of fatal disputes, then of all militarized disputes. With a continuous independent variable we can use ordinary least squares regression for the distributed-lag analyses. The model is:

\[
\ln\text{TRADE}_{ij,t} = \ln\text{GDP}_{i,j,t-1} + \ldots + \ln\text{GDP}_{i,j,t-10} + \ln\text{POPULATION}_{i,j,t-1} \\
    + \ldots + \ln\text{POPULATION}_{i,j,t-10} + \text{DEM}_{i,t-1} \cdot \ldots + \text{DEM}_{i,t-10} \\
    + \text{IGO}_{i,t-1} + \ldots + \text{IGO}_{i,t-10} + \text{ALLIES}_{i,t-1} \\
    + \ldots + \text{ALLIES}_{i,t-10} + \text{NONCONTIG}_{i,t-1} \\
    + \text{DISTANCE}_{i,t-1} + \text{FATAL}_{i,t-1} + \text{FATAL}_{i,t-2} + \ln\text{TRADE}_{i,t-1} \\
    + \ldots + \ln\text{TRADE}_{i,t-10}
\]  

(2)

As before, we seek to account fully for the effects of states’ commercial history on current levels of trade. We use ten lags for our analyses with the onset of both fatal disputes and all disputes. As before, the number of lags was determined by adding terms of the left-hand-side variable until they were no longer significant. Ten lags of FATAL and ONSET were initially included, and the probability that their coefficients were jointly zero was less than .001 in both cases; but because the onset of disputes is not highly correlated through time, only two lagged values of the conflict indicators are necessary to capture their effects on commercial relations. The effect of conflict on trade is substantial, as will be seen; but it is evidently brief.

Column 1 of Table 3 shows the results for the effects of the onset of fatal disputes and other influences on bilateral trade, and column 2 presents the analysis for all disputes, not just fatal ones. In both columns, economists’ gravity model of trade performs as expected. More interestingly, democracies and states sharing many common IGO memberships trade more with each other, as the Kantian perspective suggests. A history of high levels of trade is manifested in continuing high trade, even controlling for the influences of nations’ size and wealth. And, as liberal theory leads us to expect, a fatal dispute reduces trade. This result is consistent with Anderton and Carter (2001) and Russett and Oneal (2001), though Bliss and Russett (1998) and Morrow, Siverson, and Tabares (1998) find no significant effect of disputes on trade. The effect of a less violent dispute is limited to the first year after its onset. The major surprise is the effect of an alliance: controlling for the other variables in the model, allies actually trade less with one another.

Table 4 illustrates in substantive terms the implications of these analyses for the variables of greatest interest. A militarized dispute, especially one involving fatalities, has the strongest effect on trade. The onset of a fatal dispute reduces trade 33 percent the following year. The effect is still strong in the second year; trade is nearly 26 percent lower than if there had not been a dispute. When all disputes are considered, trade drops 19 percent in the year after an onset; in the following year it is about 3 percent lower than if no dispute had occurred. These results indicate that the relationship between trade and conflict is reciprocal. Peace and commerce promote each other, as the liberals expected. Not surprisingly, the effect in both analyses is greatest when a fatal dispute is involved. Also worth noting are the positive effects of democracy (\(p < .001\)) and a network of international organizations (\(p < .001\)) in encouraging trade. The importance of IGO memberships is especially strong, greater than 14 percent in both analyses. Being allied has little influence on the level of trade when the benefits of joint democracy and IGOs are held constant. If these variables are dropped from the equation, allies trade 2.5 percent more than non-allied states, all other things being equal.
Conclusion

In this article we sought to assess the causal effects of democracy, interdependence, and joint memberships in intergovernmental organizations on the probability that a pair of states will become involved in a militarized dispute. We used a distributed-lags model in keeping with Granger's (1969) logic: the Kantian variables are plausible causes of peace if their influence is apparent even after controlling for the history of dyadic conflict. We examined all pairs of states for which data are available, 1885–1992. The pacific benefits of democracy and trade are statistically significant, substantively important, and robust. If both states in a dyad are democratic, the likelihood of a fatal dispute is 86 percent less than if at least one state is an autocracy; and we find no evidence that democratization is dangerous.

Table 3. Distributed-Lags Models of Bilateral Trade (log), 1885–1992

<table>
<thead>
<tr>
<th>Variable</th>
<th>Fatal MIDs</th>
<th>All Onsets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democracy Score$_L$</td>
<td>0.00135</td>
<td>0.00136</td>
</tr>
<tr>
<td></td>
<td>3.29</td>
<td>3.22</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Joint Memberships in IGOs</td>
<td>0.0366</td>
<td>0.0361</td>
</tr>
<tr>
<td></td>
<td>31.8</td>
<td>31.3</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Allies</td>
<td>– 0.00727</td>
<td>– 0.00785</td>
</tr>
<tr>
<td></td>
<td>3.90</td>
<td>3.91</td>
</tr>
<tr>
<td></td>
<td>.002</td>
<td>.001</td>
</tr>
<tr>
<td>Gross Domestic Products (log)</td>
<td>0.0497</td>
<td>.0500</td>
</tr>
<tr>
<td></td>
<td>94.4</td>
<td>93.5</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Populations (log)</td>
<td>– 0.0163</td>
<td>– 0.0161</td>
</tr>
<tr>
<td></td>
<td>22.4</td>
<td>22.0</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Previous trade (log)</td>
<td>0.957</td>
<td>0.957</td>
</tr>
<tr>
<td></td>
<td>54,518</td>
<td>55,400</td>
</tr>
<tr>
<td>Dispute in $t - 1$</td>
<td>– 0.401</td>
<td>– 0.208</td>
</tr>
<tr>
<td></td>
<td>0.092</td>
<td>0.042</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Dispute in $t - 2$</td>
<td>– 0.305</td>
<td>– 0.0262</td>
</tr>
<tr>
<td></td>
<td>– 0.082</td>
<td>0.0389</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>.50</td>
</tr>
<tr>
<td>Distance (log)</td>
<td>– 0.0303</td>
<td>– 0.0309</td>
</tr>
<tr>
<td></td>
<td>0.0028</td>
<td>0.0028</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>Contiguity</td>
<td>0.0159</td>
<td>0.0198</td>
</tr>
<tr>
<td></td>
<td>0.0081</td>
<td>0.0081</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.02</td>
</tr>
<tr>
<td>Constant</td>
<td>– 1.08</td>
<td>– 1.09</td>
</tr>
<tr>
<td></td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td></td>
<td>0.001</td>
<td>0.001</td>
</tr>
<tr>
<td>$F$ (64, 8125)</td>
<td>95,429.1</td>
<td>92,586.4</td>
</tr>
<tr>
<td>$p$ of $F$</td>
<td>.0001</td>
<td>.0001</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.95</td>
<td>0.95</td>
</tr>
<tr>
<td>$N$</td>
<td>154,388</td>
<td>154,123</td>
</tr>
</tbody>
</table>
Relations between an established democracy and a newly democratic state are markedly more peaceful than if the second state had remained autocratic, and the full benefits of the democratic peace accrue quickly. Increasing economic interdependence from the 10th to the 90th percentile reduces the risk of a fatal dispute by 32 percent. Finally, an increase of the same magnitude in the number of shared memberships in intergovernmental organization cuts the risk of a fatal dispute by 43 percent—a greater effect than previously reported (Russett and Oneal, 2001; Bennett and Stam, 2000). If all three Kantian elements are set at high levels, the incidence of fatal disputes drops by 95 percent. Given these dramatic effects, it seems prudent for policymakers to encourage the spread of democratic institutions and the expansion of commerce globally. Effective international organizations, too, are integral to this process, as Mansfield and Pevehouse (2000), too, argue.

The pacific benefits of democracy, economic interdependence, and international organizations are all the more apparent if they are compared to the effects of alliances and a preponderance of power—the elements stressed in realist theories of international politics. Surprisingly, alliances do not reduce the likelihood of interstate disputes, even fatal ones, when the influences of the Kantian variables and previous dyadic conflicts are held constant. This finding has implications for current attempts to establish security in central Europe. Efforts to consolidate democracy, increase interdependence, and create a network of international organizations, our results suggest, should have greater benefits than the expansion of NATO (Reiter, 2001b). Consequently, policymakers should incorporate the Kantian elements in their strategy for peace.

The effect of a preponderance of power on the likelihood of conflict is substantial, as realists suggest. Increasing the capability ratio from the 10th to the 90th percentile reduces fatal disputes by 73 percent, but this is achieved only by raising the ratio of militarily significant capabilities 39-fold. This is clearly an impossible objective for a state acting on its own, but it does indicate the secure position of the United States vis-à-vis most states today. Rapid economic growth in China has eroded the U.S. advantage in recent years. Our analyses, however, strongly indicate that the rising power of China can be managed by drawing it into the Kantian system. Increased trade, greater contact in international organizations, and some moderation in the authoritarian character of the Chinese government have reduced the probability of a fatal dispute between these major powers 58 percent below what it would have been if relations had not improved since the mid-1960s. Eventually China may become democratic, further increasing the prospects for peace. A transition to democracy, according to our analyses and those of most others, would be much less dangerous than continued autocracy; but even in the absence of democracy in Beijing, a strong web of commercial ties and international organizations offers substantial pacific benefits.

Our results indicate that trade and conflict are reciprocally related. As liberal theory indicates, militarized disputes disrupt trade, which is why interdependent states avoid them; but the effect of an isolated dispute is short-lived. A dispute

| Causes of Peace |

Table 4. Change in Bilateral Trade, 1885–1992, in Percent Based on the Estimated Coefficients in Table 3

<table>
<thead>
<tr>
<th>Causes</th>
<th>Fatal MIDs</th>
<th>All Onsets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dispute in year $t - 1$</td>
<td>$- 33.0%$</td>
<td>$- 18.7%$</td>
</tr>
<tr>
<td>2. Dispute in year $t - 2$</td>
<td>$- 26.3$</td>
<td>$- 2.6$</td>
</tr>
<tr>
<td>3. Increase in Democracy from 10th to 90th percentile</td>
<td>$+ 2.6$</td>
<td>$+ 2.6$</td>
</tr>
<tr>
<td>4. Increase in IGOs from 10th to 90th percentile</td>
<td>$+ 14.3$</td>
<td>$+ 14.1$</td>
</tr>
<tr>
<td>5. Allies equals 1</td>
<td>$- 0.7$</td>
<td>$- 0.8$</td>
</tr>
</tbody>
</table>
normally affects trade for only one or two years. We also confirmed that democracy and, especially, shared international organization memberships, promote commerce. As Kant (1927 [1795]) suggested, democracy, interdependence, and participation in international organizations are mutually reinforcing. We found no indication, however, that allies have high levels of trade when the influence of joint democracy and IGOs are held constant. This importantly qualifies the results of past research (Pollins, 1989a, 1989b; Gowa and Mansfield, 1993; Gowa, 1994; Mansfield and Bronson, 1997a, 1997b; Morrow, Siverson, and Taberes, 1998, 1999).

Our analyses provide greater grounds for optimism about world peace than Kant himself enjoyed (Waltz, 1962). Only recently have a substantial number of interdependent, democratic states bound together in international organizations come into existence, and the social scientific methods been developed that allow his philosophical proposal to be evaluated. Our results indicate that a Kantian system is evolving (Covell, 1998; Cederman, 2001a, 2001b). An added benefit of global political and economic liberalization is a greater prospect for peace. Of course, realist principles still dominate interstate relations between many states; but efforts must be made to expand the Kantian system. As weapons of mass destruction become more accessible, it is essential to find a safer, more sure foundation for world politics. Democracy, interdependence, and international organizations offer this promise.

References


