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The Classical Liberals Were Right: Democracy, Interdependence, and Conflict, 1950–1985

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The liberals believed that economic interdependence, as well as democracy, would reduce the incidence of interstate conflict. In this article, we test both their economic and their political prescriptions for peace, using pooled-regression analyses of politically relevant dyads for the Cold War era. We find that the pacific benefits of trade, both total and dyadic, have not been sufficiently appreciated. We also offer clear evidence that democracies are relatively unlikely to become involved in militarized disputes with other democracies, while autocracies and democracies are prone to conflict with each other. Since democratic dyads are more peaceful than autocratic dyads, it follows that democracies are more peaceful than autocratic states generally, ceteris paribus. Previous research at the national level of analysis, which led most to conclude that democracies have been no more peaceful than other states, did not consider that the incidence of conflict depends importantly upon the number of contiguous states, the character of their political regimes, and other factors. In addition, we find no evidence that states that have recently undergone regime changes, whether in the democratic or autocratic direction, are particularly conflict prone. Our results suggest the basis for a broader formulation of expected-utility theories of interstate conflict.

Research on the "democratic peace" has recently been expanded to include consideration of economic interdependence. This "liberal peace" perspective incorporates the hypothesis that trade and foreign investment, as well as institutions and practices of democratic governance, reduce the incidence of militarized conflict between countries. Like the democratic peace, this view has its origins in a classical literature that most clearly addressed the individual characteristics of states, that is, that democratic states and those economically open will be more peaceful in their diplomatic and military relations. But consideration of the pacific benefits of trade

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and democracy has progressed by focusing on their conflict-reducing potential in dyadic analyses. Indeed, the effects of either democracy or interdependence on states' behavior can be obscured unless careful attention is paid to their bilateral consequences. The importance of analyzing the behavior of pairs of states is all the more evident when the liberal peace is evaluated within the wider context of international relations theory, particularly its "realist" forms which stress the importance of alliances, relative power, and geostrategic location—influences best represented dyadically. Any synthesis of liberal and realist perspectives will, therefore, benefit from systematic attention to states' bilateral relations. In the process, the monadic influences of regimes and economic interdependence can be clarified.

In this article, we extend our earlier work (Maoz and Russett, 1993; Oneal et al., 1996) on democracy, interdependence, and conflict in several ways. First, while employing the same basic method of analysis, we use a better, more theoretically grounded specification of the way that political regimes and trade affect the likelihood of a militarized dispute. This allows us to reassess the influence of democracy at the national and dyadic levels of analysis and to estimate the independent effects of dyadic interdependence and economic openness generally. We also make comparisons of the relative benefits of the liberals' political and economic programs. Second, we use newly revised and expanded data on political regimes and militarized disputes for our empirical investigations. Finally, we utilize our improved specifications and data to perform the first tests of the effects of regime change—the process of democratization or autocratization—on the prospects for peace in dyadic relations. Our results increase our confidence that the classical liberals were right: democracy and trade do reduce the likelihood of military conflict, at least in the post–World War II era. We find no evidence that democratization endangers international peace.

The Liberal Peace: Classical Perspectives and Recent Research

The classical liberals advocated policies to increase liberty and prosperity. They sought to empower the commercial class politically and to abolish royal charters, monopolies, and the protectionist policies of mercantilism so as to encourage entrepreneurship and increase productive efficiency. They also expected democracy and laissez-faire economics to diminish the frequency of war. Political scientists have recently addressed the connection between democracy and international conflict, but they have shown less interest in the consequences of free trade and economic interdependence. Yet, expanded trade was advocated as a remedy for war before democracy was a realistic possibility in most countries. In the early seventeenth century, Emeric Crucé concluded that wars arose from international misunderstandings and the domination of society by the warrior class. Both could be reduced by expanding commerce: trade created common interests and increased the prosperity and political power of the peaceful, productive members of society. Later, the role of economic relations in promoting peace was emphasized by François Quesnay, Anne Robert Turgot, and the French Physiocrats; by Adam Smith and his followers in England; and by Thomas Paine (Howard, 1978; Domke, 1988:43–51). Subsequently, the Manchester school of "commercial liberalism" argued that the cost of war made it anachronistic, as did Norman Angell and Joseph Schumpeter somewhat later. The benefits of interdependence are also central to functionalist accounts of political integration (Mitrany, 1966) and reminiscent of some socialists' emphasis on the virtues of internationalism (Domke, 1988:46).

Our late-twentieth-century reading of Immanuel Kant's treatise on *Perpetual Peace* ([1795] 1991) suggests that peace can be built on a tripod of complementary influences: republican constitutions (i.e., representative democracy), international law and organization, and "cosmopolitan law" (economic interdependence). First, constitutional constraints eliminate autocratic caprice in waging war. From that, a

respect for the legitimate rights of all citizens and republics creates a moral foundation for the liberal peace, upon which eventually an edifice of international law and organization can be built. Lastly, economic interdependence reinforces structural constraints and liberal norms by creating transnational ties that encourage accommodation rather than conflict. Thus, material incentives add their force to law and morality. Such a vision animated the founders of what has become the European Union (Urwin, 1995).

Whether democracies are more peaceful than other states is still disputed, but powerful evidence shows that democracies rarely fight one another (Maoz and Abdolali, 1989; Bueno de Mesquita and Lalman, 1992; Russett, 1993; Ray, 1995; Rummel, 1996; Weart, 1997). Theoretical explanations of these results typically imply that the more democratic a pair of states, the less likely they are to be involved in armed conflict (Bueno de Mesquita and Lalman, 1992; Lake, 1992; Starr, 1992). Yet, with the notable exception of Domke (1988), researchers before Maoz and Russett (1993) used categorical measures of regime in assessing the democratic peace. As Gleditsch (1992) noted, our confidence in the pacific benefits of democracy would have to be tempered if they were evident only above a high threshold.

Maoz and Russett (1992, 1993) showed that the link between democracy and peace in the post–World War II era remains strong when other, potentially confounding influences on the likelihood of conflict are controlled. Some had suggested that the democratic peace was more easily explained by the network of alliances that linked democracies during the Cold War era, the hegemonic power of the United States, or their superior wealth or economic performance. But, in fact, democratic states became involved in militarized disputes with one another less often than did other pairs of states even when contiguity, alliance ties, the level and rate of economic development, and the dyadic balance of power are held constant. Maoz and Russett's work parallels that of Bremer (1992, 1993), who used a similar analytical procedure and controls to identify the "dangerous dyads" among all pairs of states, 1816–1965. Together, these studies provide strong evidence that joint democracy reduces conflict.

Maoz and Russett's work differed from Bremer's 1992 article in three ways. First, they extended research on the democratic peace to militarized conflict below the level of an interstate war. A major difficulty with research on the causes of war, as Bremer noted, is the paucity of cases. In fact, of his nearly 203,000 dyad-years, only 85, or .04 of 1 percent, were incidences of war. By considering states' participation in militarized interstate disputes Maoz and Russett dramatically increased the proportion of conflictual cases.[1] Second, their study was confined to the Cold War period, which, despite the risk of limiting the historical scope of their findings, had the advantage of making more reliable data available, especially for economic variables. Finally, Maoz and Russett considered only politically relevant dyads: pairs of states that are either contiguous or include a major power. This choice was consistent with Bremer's bivariate results showing that contiguity and major-power involvement are the most important factors accounting for war. Indeed, the politically relevant pairs of states are involved in 74 percent of all disputing cases, 1946–1986, though they constitute only 12 percent of the total number of dyad-years.[2]

[1] The number of positive cases was also increased by including annual observations of disputes that continued beyond one year. This is consistent with the assumption that decision makers periodically reevaluate their decision to be involved in a dispute (Blainey, 1988). In adopting the same practice, we are in essence weighting our analyses by the duration of disputes; but limiting consideration to the initial year, as Bremer (1992) did, does not change the results appreciably (Oneal et al., 1996).

[2] Gates and McLaughlin (1996) have shown that Maoz and Russett's (1993) results are not sensitive to modifications of the set of "politically relevant" dyads or to the choice of the logistic estimator. Raknerud and Hegre's (1997) use of Cox regression to estimate the hazard of war also attests to the robustness of those analyses.

Despite the accumulation of evidence for a separate peace among democracies, the debate between realists and liberals is not fully resolved, as several recent critiques and subsequent replies indicate.[3] Most importantly, whether democracies are more peaceful than nondemocratic states at the national level of analysis is still contested. The consensus is that conflict reduction depends more on both states being constrained by democratic norms and institutions than on the consequences of those constraints on the states individually. Thus, there is general agreement that the pacific benefits of democracy are much stronger when democracies interact, though a significant body of research indicates some monadic effect (Bremer, 1992; Benoit, 1996; Rousseau et al., 1996; Rummel, 1996). In addition, Mansfield and Snyder (1995, 1996) have argued that the democratic peace is limited to relations among mature democracies and that, ironically, the process of democratization makes fledgling democracies prone to conflict. From statistical analyses of the period 1811–1980, they concluded that states become more aggressive, not less, in the years after a transition to democracy; and polities that made the biggest change, from complete autocracy to democracy, presented the greatest risk. It is natural, of course, that the character and limits of the democratic peace be explored in an ongoing dialectical program of research. We contribute to this process by considering the peacefulness of regimes at both the monadic and dyadic levels and by reevaluating Mansfield and Snyder's findings regarding the dangers of democratization.

In contrast to testing the influence of political regimes, the role of economic interdependence in preventing conflict has, until recently, largely been ignored (Levy, 1989). Yet, trade is a mutually beneficial interaction, giving each party a stake in the economic well-being of the other—and in avoiding militarized disputes. Military conflict would endanger an importer's supply of needed goods and services, and alternative sources would be less satisfactory in price and/or quantity. Similarly, military conflict damages exporters' interests. Indeed, the need to shift to the second-best trading partner may involve such high costs that a state is effectively vulnerable to a disruption of trade (Keohane and Nye, 1977:8–13).[4] Even a relatively low-cost change in trading patterns may have significant political consequences by reducing the sensitivity and responsiveness of a state to the preferences of its former trading partner, because trade and foreign investment are media for communicating on a broad range of matters beyond the specific commercial exchange taking place. These communications form a potentially important channel for averting interstate conflict. In sum, economic interdependence contributes to the creation of a "security community" (Deutsch et al., 1957; Russett, 1998), in which shared values make the resort to force unimaginable.

Democracy may encourage interdependence. In democracies, economically powerful groups are likely to be politically powerful as well (Papayoanou, 1996). Political and economic freedoms allow individuals to form transnational associations to influence policy (Verdier, 1994; Risse-Kappen, 1995). Trade agreements among democracies may also be particularly long lasting. Because executives in democratic countries must persuade and accommodate other powerful groups—the legislature, their party, interest groups—they are more likely to abide by their international commitments than are nondemocratic leaders whose power is less subject to checks and balances. Economic ties require credible commitments regarding the terms of

[3] Critiques include Cohen (1994), Layne (1994), Spiro (1994), Gowa (1995), Farber and Gowa (1995), and Oren (1995). For replies see Owen (1994), Russett (1995, 1996), Russett and Ray (1995), and Maoz (1996).

[4] Gowa (1995) argues that even economically important trade need not deter conflict: but contrary to her assumptions, military conflict generally does make trade less feasible and asymmetries in the cost of adjustment are important. These points were made with regard to the recent confrontation between China and Taiwan (*The Economist*, 1996; Faison, 1996).

trade and capital flows; hence, democracies should be better at promoting and sustaining interdependence (Martin, 1995). In fact, democracies are inclined to trade with one another (Bliss and Russett, 1996). With other democratic states, they need not fear entering into economic relationships for absolute gains in welfare for fear that trading partners' greater relative gains will imperil their security (Powell, 1991; Gowa and Mansfield, 1993).[5]

A challenge to the liberal view comes from those who emphasize that economic ties not only offer the prospect of mutual gain but also may transmit economic ills and create rivalry over the division of benefits. Especially when relations are asymmetrical, trade can be a source of influence (Keohane and Nye, 1977; Kroll, 1993), which may lead to dependency, exploitation, and conflict (dos Santos, 1970; Rubinson, 1976; Mearsheimer, 1992). Thus, contemporary analysts are divided over the consequences of interdependence.

Few empirical assessments have been made of the consequences of trade for interstate relations. Early studies by Russett (1967) and Wallensteen (1973) did not yield strong support for the liberal thesis, but later studies have been more positive. Articles using events data to measure conflict between states have consistently shown that the economic importance of a nation's trade (trade/gross domestic product) is inversely associated with conflict, especially when additional measures of the costliness of disrupting trade are included in the model (Polachek, 1980; Gasiorowski and Polachek, 1982; Gasiorowski, 1986; Polachek, 1992; Polachek and McDonald, 1992; Polachek, 1994). Domke (1988) found strong support, in both the nineteenth and twentieth centuries, for the pacific benefits of commerce: countries that exported more were less likely to initiate wars, an effect most pronounced after World War II. At the systemic level of analysis, Mansfield (1994) has shown that a high level of trade reduces the average number of wars initiated over five years. He, like Polachek (1992), concluded that trade has a significant effect on the level of conflict even when the reciprocal effect is simultaneously estimated. Pollins (1989a, 1989b), Gowa and Mansfield (1993), and Gowa (1994) show that trade is influenced by states' interests and by potential conflict, as indicated in the structure of alliances. We need to know, therefore, whether interdependence has important pacific benefits when the influence of alliances is controlled.

We must be attentive to the direction of causality, and to differing implications of the interest and communications hypotheses. Although commerce between states at war was not uncommon before the nineteenth century, in the modern era states usually take effective steps to prevent their citizens from "trading with the enemy." Even in the absence of war, boycotts, embargoes, and lists of restricted goods have been common instruments in the conduct of international conflict. Thus, rational calculations of interest may lead a state expecting conflict to impose restrictions on the commercial activities of its citizens (Copeland, 1996), resulting in a declining trend in trade. Conversely, governments may promote trade with a country seen as a reliable ally. But falling levels of trade may exacerbate, as well as signal, deteriorating political relations by reducing the flow of valuable interstate communications. Effects in both causal directions are plausible (Reuveny and Kang, 1996); but Kim's (1996) dyadic analyses show that trade's inhibiting influence on the incidence of militarized disputes in the Cold War era is robust when one controls for the effect of conflict on trade.

Analyses using the total trade-to-GDP ratio—a common measure of economic openness—provide a valuable check on the direction of causality. Because an ongoing dispute is apt to discourage some traders and investors from third

[5] Weede (1995) argues that interdependence and democracy interact in another beneficial way. Trade, he suggests, increases economic growth rates, which raises the prospects for democracy, thereby reducing the incidence of conflict.

countries, states with open economies must be concerned about these indirect costs of resorting to military measures. A state can restrict bilateral trade with a potential adversary relatively easily, but it would be far more difficult to become substantially more autarkic in anticipation of conflict. Consequently, the total trade-to-GDP ratio, as well as a state's economic dependence on bilateral exchange, as we show below, is a measure of costs associated with the use of force.

Oneal et al. (1996) extended Maoz and Russett's (1993) research by replicating their regression analyses of the Cold War era but adding a measure of interdependence based on the economic importance of bilateral trade. After assessing both the liberals' political and economic prescriptions for peace, they concluded that the benefits of interdependence have not been sufficiently appreciated. The pacifying effect of trade was especially apparent among contiguous pairs of states, where conflict is most frequent. Oneal et al.'s evidence for the democratic peace was mixed. Their dichotomous indicator of joint democracy was always closely associated with lower levels of conflict; but a continuous measure was generally insignificant when interdependence was also in the equation. The continuous measure of joint democracy used in Maoz and Russett and in Oneal et al. is problematic, however; and a more theoretically grounded way of creating dyadic variables from the data for individual countries is needed. We address this issue in the next section.

Not all recent research indicates that economic interdependence inhibits interstate conflict. Barbieri (1996a) found little support for the liberals' belief that trade is a path to peace. Indeed, her analyses of data from 1870 to 1938 seem to show that interdependence increases the likelihood of a militarized dispute. She reached the same conclusion in analyzing the post–World War II era (Barbieri, 1995). The discrepancy between her findings and those of Oneal et al. is primarily the result of their different sets of cases. Barbieri analyzed all pairs of states for which trade data are available, while Oneal et al. limited their study to bordering countries and dyads involving a major power. Including other dyads without controlling for the distance separating states is apt to produce a spurious association between interdependence and conflict: states geographically proximate have a high incidence rate of disputes, because proximity produces opportunities to fight and issues to fight about (Siverson and Starr, 1991; Goertz and Diehl, 1992; Kocs, 1995). Trade levels, too, are positively related to geographical proximity (Tinbergen, 1962; Deardorff, 1995).[6] Secondarily, the discrepancy in Barbieri's and Oneal et al.'s results is due to differences in the measurement of interdependence. Barbieri (1996a), like de Vries (1990), used trade concentration, $\text{trade}_{ij,t}/\text{total trade}_{i,t}$, as the basis for estimating the effects of economic ties on interstate relations, while most others (Polachek, 1980; Gasiorowski and Polachek, 1982; Gasiorowski, 1986; Domke, 1988; Mansfield, 1994; Oneal et al., 1996) have used some version of the trade-to-GDP ratio. The latter is preferable since states can vary dramatically in the degree to which trade is economically important. Barbieri (1996b) has recently confirmed that interdependence reduces the likelihood of conflict among the politically relevant dyads in the postwar period and that this effect is more evident using the trade-to-GDP ratio. Way (1997) concludes that economically important trade has reduced conflict throughout the 1850–1990 period.

[6] Gleditsch (1995) and Lemke (1995) have emphasized the need to consider the effect of distance. Below we employ a simple measure of contiguity to distinguish bordering states from the noncontiguous pairs involving a major power. In later research we will incorporate distance explicitly.

Research Design

In this section we explore the "liberal peace" using logistic regression analysis (*Stata Reference Manual*, 1995) of pooled cross-sectional and time-series data. The unit of analysis is the dyad-year. We limit our study to contiguous pairs of states and dyads that contain at least one state defined as a major power by the Correlates of War (COW) project. This excludes dyads that, in the great majority of cases, had no reasonable opportunity to engage in armed conflict because they were too weak militarily and had few serious interests at stake. We examine the years 1950–1985—essentially the Cold War era. This period is suitable for testing liberal theory because there were a relatively large number of democracies and trade grew rapidly and was economically important. Moreover, factors thought to confound tests of the democratic peace—alliances and economic growth rates, in particular—are amenable to statistical control. The sample size for our tests ranges from 17,709 to 20,990.[7] We focus below on new measurement decisions, giving but brief attention to variables whose measurement has been previously documented (Maoz and Russett, 1993; Oneal et al., 1996).

Dependent Variable: Dispute

We use the set of militarized interstate disputes assembled by the Correlates of War project. A militarized dispute is an international interaction involving threats, displays, or actual uses of military force; it must be explicit, overt, not accidental, and government sanctioned. These data have recently been extensively revised (Bremer, 1996); and the number of disputes has increased significantly, to 947 disputing dyad-years in our data versus 581 with the older COW data. $\text{DISPUTE}_{ij,t}$ is a dichotomous variable that equals 1 when a dyad was involved in a dispute in year t and 0 otherwise.[8]

Independent Variables

Democracy. We assess the effect of political regimes on dispute involvement using an improved continuous measure of joint democracy and recently revised data regarding political regimes. We assume that the likelihood of dyadic conflict is primarily determined by the less constrained of the two states in a dyad. Adoption of this weak-link assumption is a significant change from our previous research (Maoz and Russett, 1993; Oneal et al., 1996). Before, individual regime scores were converted into a dyadic variable, as follows:

$$\text{JOINREG}_{ij,t} = (\text{REG}_H + \text{REG}_L) / (\text{REG}_H - \text{REG}_L + 1)$$

where REG_H is the higher regime score in each dyad and REG_L is the lower. This variable was designed to reflect two things simultaneously: how democratic the

[7] The lack of economic data is the most common reason that cases are omitted from our analyses. This surely biases our tests against the liberal peace, because data on trade and GDP are missing for several conflict-prone autocracies, in particular, North Korea, (North) Vietnam, and Cuba. Indeed, the most obvious cases of conflict for which data are unavailable are the Korean and Vietnam Wars, which pitted mostly democratic states against autocracies with whom they had no significant economic ties.

[8] We use dispute involvement as our dependent variable, rather than the highest level of hostility reached in a dispute, because of doubts about the ordinality of the latter measure. Many uses of force, for example, the seizure of a fishing vessel, are less serious than some threats, for example, to initiate general war. We also estimated our equations for war only. Since there are only 213 dyad-years of war in our data set we have less confidence in these results; accordingly, we discuss them in the text but do not report them in a table.

members of a dyad are, and the similarity of their regimes. But this calculation is problematic because it does not increase monotonically with increases in the constituent scores.[9]

Rather than combine individual states' scores into a dyadic variable using an alternative formula, as Oneal and Ray (1997) do, we assume the likelihood of conflict to be primarily a function of the degree of political constraint experienced by the less constrained state in each dyad. This weak-link assumption (Dixon, 1994) is the basis of Bueno de Mesquita and Lalman's (1992) international interactions game (Starr, 1992). Thus, we expect DISPUTE to be a function of the lower democracy score in a dyad ($DEM_{L,t}$); but we also consider whether the likelihood of dyadic conflict is influenced by the political character of the other member of a dyad by including the higher regime score ($DEM_{H,t}$) in several analyses. Including both the higher and lower scores in a regression equation allows us to clarify the effects of political regimes at both the national and dyadic levels of analysis.

We measure regimes along the democracy-autocracy continuum using the corrected Polity III data. Jaggers and Gurr (1995, 1996) have evaluated countries using separate scales for autocracy (AUTOC) and democracy (DEMOC). Like them, we created a summary measure of the political character of regimes using both scales: $DEM_{i,t}$ equals $DEMOC_{i,t}$ minus $AUTOC_{i,t}$. This creates a simple, easily interpretable index that ranges from +10 (most democratic) to –10 (most autocratic). It is preferable to using either component alone, because many governments have characteristics of both democracy and autocracy.[10]

Political Change. We assess Mansfield and Snyder's (1995, 1996) hypothesis regarding the danger of democratization in two ways. First, we created variables to indicate whether the states in a dyad were recently involved in transitions from autocracy to democracy or from democracy to autocracy. To mark these dramatic changes, we rely on Jaggers and Gurr's (1995) definitions of "coherent democracy" and "coherent autocracy." A country is a full-fledged, or coherent, democracy if its DEMOC – AUTOC score is greater than +6; a country is unambiguously autocratic if it is less than –6. Mansfield and Snyder report that their results are stronger when the effect of transitions is assessed over a five- or ten-year period, rather than a shorter interval; moreover, they argue persuasively that the dangers of a shift to democracy extend over a period of several years.

Accordingly, if DEM_i in year t is greater than +6 and it is less than –6 in any year from t-5 through t-1, our indicator of a democratic transition ($AUTOC \rightarrow DEMOC_i$)

[9] Consider a pair of states whose regime scores are 50 and 50, significantly above the democratic threshold (+30) used in our previous articles. JOINREG is (50 + 50) / (50 - 50 + 1), or 100. If one regime becomes more democratic, however—with a new regime score of 70, for example—while the other remains unchanged, the effect on the measure of joint democracy is surprising. JOINREG now equals (70 + 50) / (70 - 50 + 1), or 5.7. The continuous measure of joint democracy has declined to a fraction of its previous value despite the fact that one of two democratic states has become even more democratic. As Rummel (1996: ch. 3) notes, combining a measure of joint democracy (the numerator of the JOINREG formula) with a measure of the political distance separating the states (the denominator) makes the interpretation of results difficult.

[10] Using the DEMOC–AUTOC score to assess the character of political regimes marks another change from Maoz and Russett (1993) and Oneal et al. (1996). The earlier measure equaled the difference of the Polity scales multiplied by a measure of power concentration (PCON), which indicates the extent to which a government exercises effective control over its citizens. We make this change for two reasons. First, not even the originators of the data (Gurr, Jaggers, and Moore, 1989; Jaggers and Gurr, 1995) have used power concentration as a defining characteristic of democracy. Moreover, the DEMOC–AUTOC score seems empirically more valid than REG, as indicated by their correlations with Bollen's (1993) "least-biased" index. On the basis of latent variable analyses, Bollen concluded that several early measures of autocracy-democracy contain significant systematic error; and he published data for 1980 that minimize this problem. The correlation of Bollen's estimates with the DEMOC–AUTOC index is .94, but only .83 with Maoz and Russett's REG. Jaggers and Gurr report that DEMOC–AUTOC is also highly correlated with various other indices of autocracy and democracy.

equals 1 for each year t through t+5, as long as DEM_i remains greater than +6. The last condition is important, because some countries experience extended periods of turbulent change in which political transitions are reversed. $AUTOC \rightarrow DEMOC_{j,t}$ is constructed in analogous fashion. We then created a dyadic variable by adding the individual states' variables; that is, $AUTOC \rightarrow DEMOC_{ij,t}$ equals $AUTOC \rightarrow DEMOC_{i,t}$ plus $AUTOC \rightarrow DEMOC_{j,t}$. Using $AUTOC \rightarrow DEMOC_{ij,t}$ implies that a transition in either country increases the danger of dyadic conflict and that two transitions are doubly troubling. This dyadic test seems consistent with the monadic theory advanced by Mansfield and Snyder. We also gauge the influence of transitions from democracy to autocracy. This permits us to determine if political change in general, rather than democratization per se, raises the likelihood of conflict. The variable $DEMOC \rightarrow AUTOC_{ij,t}$ was created in the same way as $AUTOC \rightarrow DEMOC_{ij,t}$; it, too, ranges from 0 to +2.

Transitions from one end of the political spectrum to the other are relatively rare, so we also evaluate Mansfield and Snyder's thesis using variables that mark year-to-year political change. $DEMOC\_CHG_{i,t}$ equals $DEM_{i,t}$ minus $DEM_{i,t-1}$ if the result is a positive number, indicating movement toward greater democracy; it equals 0 if $DEM_{i,t}$ minus $DEM_{i,t-1}$ is less than or equal to 0. $DEMOC\_CHG_{j,t}$ is calculated in the same way. A dyadic variable ($DEMOC\_CHG_{ij,t}$) was created by adding the members' individual scores, again on the assumption that the effect of political change in the two states of a dyad on the likelihood of conflict is cumulative. Thus, $DEMOC\_CHG_{ij,t}$ is the sum of any changes, year t-1 to year t, toward the democratic end of the political spectrum by the states in a dyad; it takes larger values for more dramatic changes. $DEMOC\_CHG_{ij,t}$ equals 0 if neither country changed its political regime or both became more autocratic. In analogous fashion, $AUTOC\_CHG_{ij,t}$ equals the sum of the states' movements toward greater autocracy from year t-1 to t.

Economic Interdependence. We use data regarding the direction of trade (International Monetary Fund [IMF], 1993) as the basis for our bilateral measure of economic interdependence.[11] The IMF reports country i's exports to country j ($X_{ij,t}$) and i's imports from j ($M_{ij,t}$). The economic importance of their trade is calculated relative to national income. We use gross domestic products ($GDP_{i,t}$) based on purchasing power parities (Summers and Heston, 1988, 1991), because exchange rates are known to distort international comparisons involving nontradeable goods (Marer, 1985; Passé-Smith, 1993). Specifically, country i's dependence on trade with j in year t is

$$DEPEND_{ij,t} = (X_{ij,t} + M_{ij,t}) / GDP_{i,t}.$$

As in testing the democratic peace, we assume that the less-constrained state has the greater influence on the likelihood of dyadic conflict. The less-dependent state

[11] Admittedly, trade is not a perfect indicator of economic interdependence. For one thing, its composition is not considered. A country that imports large quantities of oil, for example, may feel greater vulnerability than our measure of dependency indicates; but to the extent that international prices reflect the true value of commodities, including the possibility of disruptions to existing channels of supply, the trade-to-GDP ratio will accurately measure a country's dependence on its trading partner. On the other hand, the validity of our measure of interdependence is enhanced by the strong correlation between trade and foreign investment. To some extent, trade and foreign investment are substitutes, but even traditional forms of trade often involve the establishment of foreign commercial operations. Increasingly, however, trade takes place within the multinational corporation. Today, some 40 percent of all merchandise trade involves related subsidiaries (Alworth, 1988: 208; Spero, 1990). We are reasonably confident, therefore, that DEPEND reflects this important dimension of international economic relations, too. This is important because foreign investment, like trade, should increase the incentive for peace. Military conflict increases the risk that foreign investments will be expropriated or destroyed.

should have greater freedom to initiate conflict because its economic costs would be less and the beneficial influence of trade as communication would be less. Accordingly, we include in all our regression analyses the lower dependence score. We incorporate a one-year lag to ensure that trade has not been affected by a dispute to be explained. Thus, $DEPEND_{L,t-1}$ equals $DEPEND_{i,t-1}$ if $DEPEND_{i,t-1}$ is less than or equal to $DEPEND_{j,t-1}$; otherwise, $DEPEND_{L,t-1}$ equals $DEPEND_{j,t-1}$. We also consider whether the level of economic dependence of the more dependent state ($DEPEND_{H,t-1}$) influences the probability of a dispute. The symmetry of economic relations may be important, as dependency theorists suggest.

The likelihood of military conflict may also be a function of the trend as well as the level of interdependence (Domke, 1988; Oneal et al., 1996). To measure the trend in interdependence, we calculated the change in the dependence (dDEPEND) of states i and j over the three years prior to the year in which conflict is to be explained. To minimize the loss of cases, we substituted the change in trade over two years, or over one year for the missing values that otherwise would occur at the beginning of each dyadic time series. Thus, $dDEPEND_{i,t-1}$ equals $DEPEND_{i,t-1}$ minus $DEPEND_{i,t-4}$, when this could be computed, or $DEPEND_{i,t-1}$ minus $DEPEND_{i,t-3}$ or $DEPEND_{i,t-1}$ minus $DEPEND_{i,t-2}$, otherwise. We assess the effect of changing levels of interdependence by entering into our analyses either $dDEPEND_{i,t}$ or $dDEPEND_{j,t}$, whichever has the larger absolute value. Thus, $dDEPEND_{H,t}$ indicates the nature and degree of change experienced by the state for which changing bilateral relations have greater economic significance. We expect that a decline in the economic importance of trade increases the likelihood of conflict.

We also assess the effect of total trade on the likelihood of a dispute as a means of taking into account the economic effects of conflict on third parties and to shed light on the causal link between trade and conflict. Openness ($OPEN_{i,t}$) is a country's total exports plus its total imports divided by GDP in year t; we do not employ a one-year lag because the total trade-to-GDP ratio is substantially unaffected by particular dyadic disputes.

Alliance. $ALLIES_{ij,t}$ equals one if countries i and j are formally allied or if both are allied with the United States; it is zero otherwise (Singer and Small, 1968; Oren, 1990).

Contiguity. As noted earlier, we distinguish between two types of dyads with the potential for conflict: contiguous states and noncontiguous dyads containing a major power. $CONTIG_{ij,t}$ equals one for the contiguous dyads, including states indirectly contiguous through colonies; it is zero for the noncontiguous dyads involving one of the five major powers: China, France, United States, United Kingdom, and the USSR.

Capability Ratio. We include a measure of the dyadic balance of power, reflecting realists' belief that a preponderance of power inhibits overt conflict. To measure national capabilities, we used the COW military capabilities index (Singer, Bremer, and Stuckey, 1972) composed (in equal weights) of a country's share of the system's total population, urban population, energy consumption, iron and steel production, military manpower, and military expenditures. $CAPRATIO_{ij,t}$ is the ratio of the stronger state's capability index to that of the weaker member in a dyad.

Economic Growth. We also control for the growth rates in gross domestic product per capita experienced by the members of a dyad (Summers and Heston, 1988, 1991), because states enjoying economic success are apt to be disinclined to fight. They are beneficiaries of the status quo; and, as the liberals have emphasized,

conflict is inconsistent with modern financial and commercial relations. Moreover, regimes may have an incentive to divert attention from an economy in decline (Ostrom and Job, 1986; James, 1988; Levy, 1989; Russett, 1990; James and Oneal, 1991). Both considerations suggest that the country with the slower rate of economic growth is the greater danger to peace, so the slower growth rate is included in our analyses. We calculated the average annual change in real GDP per capita (GROWTH) in percent for countries i and j over the previous three years (or over a one- or two-year period when necessary to avoid creating missing data). If $GROWTH_{i,t}$ is greater than $GROWTH_{j,t}$, then $GROWTH_{L,t}$ equals $GROWTH_{j,t}$; otherwise it equals $GROWTH_{i,t}$.

Table 1 lists the variables used in our analyses.

Results

Democracy and Interdependence

We assess the liberal peace by simultaneously considering the influence of political regimes and economic interdependence. With the weak-link assumption, we use

TABLE 1. Definitions of Variables

	Variable	*Description*
Dispute	DISPUTE	Equals 1 if there was a threat, display, use of force, or war; otherwise, variable equals 0
Democracy	DEM_L	Lower DEMOC – AUTOC score in each dyad
	DEM_H	Higher DEMOC – AUTOC score in each dyad
Economic growth	$GROWTH_L$	Lower rate of growth in dyad of real GDP per capita, average over 3 years
Alliance	ALLIES	Indicator of alliance equals 1 if members of dyad are allied or if both are allied with the United States
Contiguity	CONTIG	Indicator of contiguity equals 1 if dyad is contiguous; equals 0 for noncontiguous dyads involving 5 major powers
Capability ratio	CAPRATIO	COW military capability ratio: stronger state's Composite Index of National Capabilities divided by weaker state's Index
Interdependence	$DEPEND_L$	Lower bilateral trade-to-GDP ratio in dyad
	$DEPEND_H$	Higher bilateral trade-to-GDP ratio in dyad
	$dDEPEND_H$	Higher change in bilateral trade-to-GDP ratio over 3 years
	$OPEN_L$	Lower total trade-to-GDP ratio in dyad
Political change	AUTOC→DEMOC	Indicator of transition from autocracy to democracy over 5-year period
	DEMOC→AUTOC	Indicator of transition from democracy to autocracy over 5-year period
	DEMOC_CHG	Sum of changes (in dyad's DEMOC – AUTOC scores) toward greater democracy, if any; if no change or change toward greater autocracy, variable equals 0
	AUTOC_CHG	Sum of changes (in dyad's DEMOC – AUTOC scores) toward greater autocracy, if any; if no change or change toward greater democracy, variable equals 0

$DEM_{L,t}$, the lower DEMOC–AUTOC score within each dyad; the lower dyadic trade-to-GDP ratio, $DEPEND_{L,t-1}$; and the lower economic growth rate, $GROWTH_{L,t}$. We also control for the presence of an alliance, geographic contiguity, and relative power within a dyad. Our first equation is

$$DISPUTE_{ij,t} = ß_0 + ß_1*DEM_{L,t} + ß_2*GROWTH_{L,t} + ß_3*ALLIES_{ij,t} + ß_4*CONTIG_{ij,t} + ß_5*CAPRATIO_{ij,t} + ß_6*DEPEND_{L,t-1}. \quad (1)$$

TABLE 2. Models of Involvement in Militarized Disputes, 1950–1985: Assessing the Liberal Peace

Variable		*Eqn 1*	*Eqn 2*	*Eqn 3*	*Eqn 4*
Democracy score$_L$	ß	-0.0497	-0.0554	-0.0413	-0.0457
	$SE_ß$	0.0074	0.0077	0.0083	0.0076
	p	<.001	<.001	<.001	<.001
Economic growth rate$_L$		-0.0223	-0.0318	-0.0297	-0.0220
		0.0085	0.0093	0.0094	0.0090
		.009	<.001	<.001	.02
Allies		-0.821	-0.868	-0.864	-0.815
		0.080	0.092	0.092	0.083
		<.001	<.001	<.001	<.001
Contiguity		1.31	1.26	1.32	1.39
		0.08	0.09	0.09	0.08
		<.001	<.001	<.001	<.001
Capability ratio		-0.00307	-0.00345	-0.00356	-0.00279
		0.00042	0.00050	0.00051	0.00041
		<.001	<.001	<.001	<.001
Dyadic trade-to-GDP ratio$_L$		-66.1		-43.8	-81.0
		13.4		12.5	15.2
		<.001		<.001	<.001
Total trade-to-GDP ratio$_L$			-0.706	-0.512	
			0.192	0.193	
			<.001	.008	
Trend, dyadic trade-to-GDP ratio$_{11}$					-8.89
					2.93
					<.001
Constant		-3.29	-3.28	-3.20	-3.32
		0.08	0.10	0.10	0.08
		<.001	<.001	<.001	<.001
Chi^2		764.04	593.65	611.74	728.56
P of chi^2		<.0001	<.0001	<.0001	<.0001
Log likelihood		-3477.57	-2795.89	-2786.85	-3231.12
N		20,990	17,709	17,709	19,772

The estimated coefficients for equation (1) are reported in Table 2. The coefficients of both DEM_L and $DEPEND_L$ are negative ($p < .001$), providing strong support for the liberal peace: increasing the constraint on the use of force, by augmenting either economically important trade or democratic institutions in the state that is freer to resort to violence, reduces the likelihood of dyadic conflict. The benefits of the liberals' economic and political prescriptions were also evident when we reestimated the coefficients in equation (1) using an indicator of dyadic war as our dependent variable. Again, the coefficients of DEM_L and $DEPEND_L$, which are not reported in a table, were negative and significant at greater than the .001 level. All the other variables in equation (1) perform as expected; and all but $GROWTH_L$ ($p < .009$) are significant at the .001 level.[12] Thus, in addition to the influence of democracy and interdependence, the incidence of disputes is reduced by economic growth, an alliance, and an overwhelming advantage in material capabilities.

Our results can be made more concrete by estimating the effect each variable in equation (1) has on the likelihood of a dyad's becoming involved in a dispute. First, we calculated a baseline probability against which to make comparisons. We set each of the continuous variables at their mean values and postulated that the pair of states was unallied and contiguous. We then estimated the likelihood of dispute involvement for this "typical" dyad using the coefficients estimated for equation (1). Next, we adjusted each variable in turn by adding one standard deviation to the continuous measures or by changing the value of the dichotomous variables, ALLIES and CONTIG. The annual probabilities of a dyad being involved in a dispute under these various conditions are given in Table 3.

The likelihood of a dispute under the baseline conditions is .078, as shown in line 1 of Table 3. This falls to .057 if the lower democracy score is increased, a drop of 27 percent. The effect of a change in the lower trade-to-GDP ratio is even greater:

TABLE 3. Annual Probabilities of Involvement in a Militarized Dispute, 1950–1985, Based on the Estimated Coefficients for Equations 1 and 2 in Table 2

	Equation 1	*Equation 2*
1. Democracy score$_L$, economic growth rate$_L$, dyadic trade-to-GDP ratio$_L$, and capability ratio at mean values; allies equals 0; contiguity equals 1	.078	.070
2. Increase in democracy$_L$ of 1 std. dev.; other variables at baseline values	.057	.049
3. Increase in dyadic trade-to-GDP ratio$_L$ of 1 std. dev.; other variables at baseline values	.047	—
4. Increase in total trade-to-GDP ratio$_L$ of 1 std. dev.; other variables at baseline values	—	.061
5. Increase in economic growth rate$_L$ of 1 std. dev.; other variables at baseline values	.073	.064
6. Allies equals 1; other variables at baseline values	.036	.031
7. Contiguity equals 0; other variables at baseline values	.022	.021
8. Increase in capability ratio of 1 std. dev.; other variables at baseline values	.021	.016
9. Capability ratio equals 1; other variables at baseline values	.122	.117
10. Capability ratio equals 10; other variables at baseline values	.119	.114

[12] Significance levels are given for two-tailed tests. This is conservative, since our hypotheses are signed and a one-tailed test would be appropriate.

a one standard deviation increase in $DEPEND_L$ drops the chance of a dispute to .047. Democracy and interdependence make a potent contribution to reducing conflict, as the liberals expected. The benefit of two states becoming allied reduces the danger of a dispute to .036; $GROWTH_L$ also has a pacific effect, lowering the probability of a dispute to .073. The higher rate of involvement in militarized disputes among contiguous states is clearly indicated in Table 3. Changing the dyad to a noncontiguous pair, while holding all other variables at their baseline values, reduces the prospect of conflict to 022.

Increasing the capability ratio also reduces the incidence of disputes. The probability of conflict falls to .021 if CAPRATIO is increased by a standard deviation; but this is misleading, because the mean and standard deviation are very large, 163 and 443, respectively. This is a result of pairing the five major powers with the many small states of the world. The probabilities of a dispute associated with more interesting values of the capability ratio are reported in lines 9 and 10 of Table 3. With the capability ratio equal to 1 and all other variables at their baseline values, the likelihood of a dispute is .122. It is only slightly less, .119, if the capability ratio is 10. Evidently, securing peace by deterrence is not an easy task.

Economic Openness

Next, we consider whether pacific benefits accrue from economic openness generally. We substitute the total trade-to-GDP ratio for the dyadic measure in equation (1), yielding

$$\begin{aligned} DISPUTE_{ij,t} = {} & \beta_0 + \beta_1{*}DEM_{L,t} + \beta_2{*}GROWTH_{L,t} + \beta_3{*}ALLIES_{ij,t} \\ & + \beta_4{*}CONTIG_{ij,t} + \beta_5{*}CAPRATIO_{ij,t} + \beta_6{*}OPEN_{L,t}. \end{aligned} \quad (2)$$

The coefficients for equation (2) are given in the second column of Table 2. They provide strong corroboration for the general thesis that economic interdependence reduces the likelihood of military conflict. Openness is closely associated with peace ($p < .001$), as is the lower democracy score ($p < .001$). All the other variables in equation (2) perform as expected and are very significant. We can assess the substantive importance of high levels of total trade using the estimated coefficients for equation (2). As shown in the second column of Table 3, an increase of one standard deviation in $OPEN_L$ reduces the probability of a dyad becoming engaged in a dispute from .070 to .061. This is one third of the effect of increasing the bilateral measure of trade by a standard deviation, which reduces the danger of a dispute by 40 percent; but it is a substantial benefit nonetheless.

A country's total trade is, of course, the sum of its bilateral commercial exchanges; but because trade can be shifted from one country to another while maintaining the same levels of total exports and imports, $OPEN_L$ and $DEPEND_L$ are to a considerable degree independent ($r = 0.32$). This permits us to determine if these influences separately affect the likelihood of dyadic conflict by estimating the following equation:

$$\begin{aligned} DISPUTE_{ij,t} = {} & \beta_0 + \beta_1{*}DEM_{L,t} + \beta_2{*}GROWTH_{L,t} + \beta_3{*}ALLIES_{ij,t} \\ & + \beta_4{*}CONTIG_{ij,t} + \beta_5{*}CAPRATIO_{ij,t} \\ & + \beta_6{*}DEPEND_{L,t-1} + \beta_7{*}OPEN_{L,t}. \end{aligned} \quad (3)$$

The results reported in the third column of Table 2 show that there are indeed independent benefits of high levels of bilateral and total trade. Both terms are significant at better than the .01 level. Estimating the likelihood of a dispute using the coefficients in equation (3) indicates that an increase of one standard deviation to $DEPEND_L$ reduces the chance of conflict from .072 (under the baseline condi-

tions) to .052; a standard deviation increase in $OPEN_L$, holding $DEPEND_L$ and the other variables in equation (3) at their baseline values, lowers it to .065. It is not surprising that bilateral economic relations are the best predictor of the tenor of dyadic relations; but it is encouraging that total trade has an independent, statistically significant, substantively important effect: as countries become increasingly open to external economic relations, they become more constrained from resorting to the use of force, even against a rival with whom commercial ties are limited. It is the world's outcasts, then, that represent the greatest danger to peaceful international relations.

Change in Bilateral Interdependence

In Oneal et al. (1996), change in the level of dyadic trade also proved to be closely associated with the incidence of disputes. We reevaluate that finding by adding to equation (1) $dDEPEND_H$, which captures the change in bilateral interdependence experienced by the state for which changing commercial ties have the greater economic significance:

$$\begin{aligned} DISPUTE_{ij,t} = {} & ß_0 + ß_1{*}DEM_{L,t} + ß_2{*}GROWTH_{L,t} + ß_3{*}ALLIES_{ij,t} \\ & + ß_4{*}CONTIG_{ij,t} + ß_5{*}CAPRATIO_{ij,t} \\ & + ß_6{*}DEPEND_{L,t-1} + ß_7{*}dDEPEND_{H,t-1}. \end{aligned} \quad \textbf{(4)}$$

The estimated coefficients reported in the last column of Table 2 indicate that rising trade dependence does herald more peaceful political relations, even holding the current level of economic ties constant. Conversely, a decline in the economic importance of trade indicates greater danger of conflict. Note that the magnitude of the coefficient of $DEPEND_L$ increases when $dDEPEND_H$ is also in the equation. Both are very significant statistically ($p < .001$). The other terms in equation (4), too, remain strongly associated with the prospects for peace.

Political and Economic Asymmetry

Next, we consider the influence of the larger regime and dependence scores on the likelihood of dyadic conflict. As noted earlier, it is generally accepted that democracies rarely engage in militarized disputes with other democracies, but there is continuing disagreement over whether they are, at the national level of analysis, more peaceful than nondemocratic states. The resolution of this question turns on the relative peacefulness of three types of dyads: democratic–democratic, democratic–nondemocratic, and nondemocratic–nondemocratic. Introducing DEM_H into equation (4) allows us to measure the conflict involvement of these pairs and clarify the effects of democratic institutions. Adding $DEPEND_H$ to equation (4) allows us to test the thesis advanced by dependency theorists, that asymmetric economic relations are prone to conflict.

$$\begin{aligned} DISPUTE_{ij,t} = {} & ß_0 + ß_1{*}DEM_{L,t} + ß_2{*}DEM_{H,t} + ß_3{*}GROWTH_{L,t} \\ & + ß_4{*}ALLIES_{ij,t} + ß_5{*}CONTIG_{ij,t} + ß_6{*}CAPRATIO_{ij,t} \\ & + ß_7{*}DEPEND_{L,t-1} + ß_8{*}DEPEND_{H,t-1} + ß_9{*}dDEPEND_{H,t-1}. \end{aligned} \quad \textbf{(5)}$$

The results of estimating equation (5) are given in Table 4. The coefficient of DEM_H is positive and quite significant ($p < .001$), while the coefficient of DEM_L remains negative and still significant at greater than the .001 level. Indeed, the magnitude of $ß_1$ and its z-score ($ß/SE_ß$) increase with the addition of DEM_H. Making a dyad more democratic by increasing the DEMOC→AUTOC score of the less-democratic state reduces the likelihood of conflict; but raising the level of joint

TABLE 4. Models of Involvement in Militarized Disputes, 1950–1985: Assessing the Liberal Peace

Variable		*Eqn 5*	*Eqn 6*	*Eqn 7*
Democracy score$_L$	ß	-0.0601	-0.0609	-0.0785
	$SE_ß$	0.0082	0.0081	0.0124
	p	<.001	<.001	<.001
Democracy score$_H$		0.0316	0.0307	0.0364
		0.0056	0.0056	0.0058
		<.001	<.001	<.001
Economic growth rate$_I$		-0.0301	-0.0294	0.0880
		0.0092	0.0092	0.0205
		.001	.001	<.001
Allies		-0.709	-0.711	-0.703
		0.085	0.085	0.085
		.001	.002	<.001
Contiguity		1.49	1.50	1.83
		0.08	0.08	0.13
		<.001	<.001	<.001
Capability ratio		-0.00252	-0.00262	-0.00243
		0.00040	0.00040	0.00039
		<.001	<.001	<.001
Dyadic trade-to-GDP ratio$_L$		-73.5	-84.9	-84.1
		17.0	15.6	15.4
		<.001	<.001	<.001
Dyadic trade-to-GDP ratio$_H$		-2.59		
		1.81		
		.15		
Trend, dyadic trade-to-GDP ratio$_H$		-9.25	-8.43	-9.41
		3.16	2.93	2.94
		<.001	.004	.001
Democracy$_L$ * contiguity				0.0276
				0.0155
				.08
Growth$_L$ * contiguity				-0.165
				0.023
				<.001
Constant		-3.59	-3.61	-3.90
		0.10	0.10	0.12
		<.001	<.001	<.001
Chi^2		761.62	759.40	819.17
P of chi^2		<.0001	<.0001	<.0001
Log likelihood		-3214.89	-3216.00	-3186.11
N		19,772	19,772	19,772

democracy by increasing democracy in the more democratic state, increasing the political distance separating the pair, makes the dyad more prone to conflict. Simply stated, democracies and autocracies fight like cats and dogs, even with the influence of alliances, etc., held constant.

The absolute values of β_1 and β_2 in equation (5) suggest that a one-unit increase in DEM_L reduces the incidence of disputes more than a one-unit increase in DEM_H raises it. Two autocracies should, therefore, be more peaceful than a democratic–autocratic pair but less peaceful than two democracies. This is easily confirmed. As before, we set the continuous variables at their means, ALLIES equal to 0, and CONTIG equal to 1, and estimate the likelihood of a dispute for these three types of dyads. The probability of two autocracies ($DEM_L = DEM_H = -10$) becoming involved in a dispute is .078. It is lower, .046, for a pair of democracies ($DEM_L = DEM_H = 10$) and greater, .137, for an autocratic–democratic dyad ($DEM_L = -10$; $DEM_H = 10$).[13]

The estimation of equation (5) shows that asymmetric interdependence does not increase conflict: $DEPEND_H$ is not significantly related to dispute involvement. To ensure that the parameters are stable, we dropped $DEPEND_H$ and reestimated the coefficients. The results (equation (6), not shown) are reported in Table 4. For politically relevant dyads taken as a group, the economic and political aspects of the liberal peace are both clearly influential.[14] This conclusion is consistent with the bivariate correlations with DISPUTE. Again we confirmed that our results were valid for the limited number of wars in our set of cases. Indeed, the coefficients of DEM_L, DEM_H, and $DEPEND_L$ kept the same sign and were significant at greater than the .001 level.

Contiguity

We next consider whether the influences of the variables in equation (5) differ in the two subsets of cases that comprise the politically relevant pairs of states, the contiguous dyads and the noncontiguous dyads involving a major power. This is important because conflict is more than three times as likely for contiguous states; yet, these pairs constitute only one third of our cases. We introduced eight interactive

[13] Friedrich (1982) suggested including an interactive term if the influence of one variable may be conditional on the value taken by another. Accordingly, we added two terms, $DEM_L * DEM_H$ and $DEPEND_L * DEPEND_H$, to equation (5). The probabilities of dispute for the three types of dyads with this specification were only slightly different, so are not reported in a table. With the interactive terms, the likelihood of conflict for two autocracies is .071; it is .044 for two democracies and .133 for a mixed dyad.

[14] We conducted several analyses to ensure the robustness of our results. The greatest danger arises from autocorrelation, but there are not yet generally accepted means of testing for or correcting this problem in logistic regressions. We did, however, modify the Cochrane-Orcutt method (Kmenta, 1986), using the predicted probabilities of a dispute as the basis for correcting for serially correlated errors. These results, too, provide strong support for the liberal theses. Beck and Tucker (1996) suggest correcting for "temporal dependence" using the length of time since the last dispute. Adding a spline function of the years of peace (PEACEYRS), as they propose, to equation (6) did reveal temporal dependence. DEM_L and DEM_H were essentially unaffected; but the magnitude of the coefficient of $DEPEND_L$ was reduced, though it remained substantively important and statistically significant. Beck and Tucker's correction for temporal dependence is problematic in the present case, however, because a high correlation between $DEPEND_L$ and PEACEYRS is theoretically expected. The length of time since the last dispute indicates to economic actors the likelihood that a dispute will recur: the greater the time elapsed, the greater traders' confidence that the end of a dispute marks a real resolution of the underlying conflict and not just a temporary hiatus. As the business risks associated with interstate conflict decline, trade should grow as a direct consequence. Thus, the effect of interdependence is reduced with the PEACEYRS correction because a necessarily related variable has been added to the equation. If the covariation with $DEPEND_L$ is removed from PEACEYRS, by regressing PEACEYRS on $DEPEND_L$ and using the residual values to eliminate temporal dependence, the coefficient and significance of $DEPEND_L$ are greater than with the original specification. We also reestimated equation (6) with indicator variables for all years but one. Again, the results were consistent with those reported in Table 3. Finally, we used bootstrapping to provide an alternative indication of the significance of the coefficients in equation (6). With 200 replications, the standard deviations of the coefficients for DEM_L, DEM_H, and $DEPEND_L$ were little changed from the standard errors reported in Table 3.

terms, created by multiplying each of the other variables in equation (5) by CONTIG. Then, we added these terms—DEM_L*CONTIG, DEM_H*CONTIG, $GROWTH_L$*CONTIG, ALLIES*CONTIG, etc.—to equation (5) and estimated the coefficients. In effect, we estimated two hyperplanes, one for each of the subsets of cases. Six of the interactive terms and $DEPEND_H$ were clearly insignificant. As Maoz and Russett (1993) expected, the influences that affect the likelihood of dyadic conflict are quite similar in the two subsets of cases. Dropping the insignificant terms yields the following equation:

$$\begin{aligned} DISPUTE_{ij,t} = {} & ß_0 + ß_1*DEM_{L,t} + ß_2*DEM_{H,t} + ß_3*GROWTH_{L,t} \\ & + ß_4*ALLIES_{ij,t} + ß_5*CONTIG_{ij,t} + ß_6*CAPRATIO_{ij,t} \\ & + ß_7*DEPEND_{L,t-1} + ß_8*dDEPEND_{H,t-1} \\ & + ß_9*(DEM_{H,t}*CONTIG_{ij,t}) + ß_{10}*(GROWTH_{L,t}*CONTIG_{ij,t}). \end{aligned} \quad (7)$$

The coefficients for equation (7) are shown in the last column of Table 4. Of the four interactive variables associated most closely with the liberal peace—those involving regime type and interdependence—only one, (DEM_L * CONTIG), proved statistically significant. Its effect is to reduce, but by no means eliminate, the pacific benefits among contiguous dyads of increasing the lower regime score. The interactive term involving economic growth does alter its implications for noncontiguous major power dyads. In all previous runs, $GROWTH_L$ was negatively associated with the likelihood of a dispute. Our interactive analysis indicates that these benefits do

TABLE 5. Annual Probabilities of Involvement in a Militarized Dispute, 1950–1985, Based on the Estimated Coefficients for Equation 7 in Table 1

	Noncontiguous Major-Power Dyads (CONTIG = 0)	*Contiguous Dyads (CONTIG = 1)*
1. Democracy $score_L$, democracy $score_H$, economic $growth\ rate_L$, $trade\text{-}to\text{-}GDP\ ratio_L$, capability ratio, and trend in dyadic $trade\text{-}to\text{-}GDP\ ratio_H$ at mean values; allies equals 0	.019	.086
2. Democracy $score_L$ and democracy $score_H$ equal +10; other variables at baseline values	.008	.054
3. Democracy $score_L$ and democracy $score_H$ equal -10; other variables at baseline values	.018	.071
4. Democracy $score_L$ equals -10 and democracy $score_H$ equals +10; other variables at baseline values	.037	.137
5. Increase in dyadic $trade\text{-}to\text{-}GDP\ ratio_L$ of 1 std. dev.; other variables at baseline values	.009	.045
6. Increase in trend in dyadic trade-to-GDP $ratio_L$ of 1 std. dev.; other variables at baseline values	.016	.076
7. Increase in economic $growth\ rate_L$ of 1 std. dev.; other variables at baseline values	.025	.068
8. Allies equals 1; other variables at baseline values	.009	.045
9. Increase in capability ratio of 1 std. dev.; other variables at baseline values	.006	.031
10. Capability ratio equals 1; other variables at baseline values	.027	.123
11. Capability ratio equals 10; other variables at baseline values	.027	.120

not accrue to the noncontiguous major power pairs. Thus, involvement in militarized disputes within this group cannot be explained by reference to the diversionary theory of conflict; nor apparently does satisfaction with the status quo, as indicated by higher rates of economic growth, reduce their rate of conflict.

We can illustrate the effects of the variables in equation (7) by again estimating the probability of a dispute under various conditions. This is done in Table 5 for both subsets of cases. Making CONTIG equal 0 reveals the influence of our variables for the noncontiguous pairs involving a major power (column 1); the experience of the contiguous dyads is reported in column 2. As before, the continuous variables are set at their mean values for the two baseline estimates (line 1).

Lines 2–4 give the probabilities of becoming involved in conflict for an autocratic pair of states, a democratic pair, and a mixed dyad. Clearly, there is a democratic peace. The probability of a dispute between a democratic major power and another, noncontiguous democracy is .008, little more than 40 percent of the baseline value of .019. Even among the contiguous subset, where the effect of joint democracy is somewhat less, the likelihood of conflict drops from .086 to .054. In a sense, there is an "autocratic peace" as well, though the likelihood of conflict between two autocracies is substantially greater than for two democracies: .018 between an autocratic major power and a noncontiguous autocracy and .071 among the contiguous dyads. The special animus between autocratic and democratic states is evident in Table 5, too. The chance of a dispute for a mixed pair is nearly double the baseline value, .037 versus .019, among the noncontiguous dyads and rises from .084 to .137 per year within the contiguous set of cases.

The benefits of high and rising levels of economic interdependence are also substantial, as shown in lines 5–6. Increasing $DEPEND_{i,t}$ by one standard deviation reduces the probability of conflict by over 45 percent in both subsets of cases. In fact, such a change has a more beneficial effect for the contiguous dyads, where the incidence of conflict is greatest, than does giving both states the highest possible democracy score. Increasing dDEPEND, while holding $DEPEND_{i,t}$ at its mean, also reduces the likelihood of a dispute; a rise of one standard deviation reduces the probability of conflict by about 12 percent in both groups.

The different effects of a growing economy in the two groups are indicated in Table 5: a one-standard-deviation increase in the growth in GDP per capita reduces the likelihood of conflict among the contiguous dyads from .086 to .068, while the probability of a dispute increases among the noncontiguous major power pairs by nearly one third. The existence of an alliance has a powerful pacific effect in both groups, reducing the incidence of conflict by nearly 50 percent. As in all our previous analyses, a change in the capability ratio must be extremely large to alter appreciably the probability of a dispute. An increase in CAPRATIO from 1 to 10 reduces the danger of conflict only from .123 to .120 among contiguous dyads; it has no discernible effect at this level of precision among the noncontiguous major power pairs.

Democratization

Finally, we reconsider the analyses of Mansfield and Snyder (1995, 1996). Is a transition from autocracy to democracy a particularly dangerous period due to the seductive appeal of jingoistic politics for an unsophisticated populace? As discussed in the previous section, we conduct two tests of this thesis. First, we consider the effects on the prospects for peace of transitions from autocracy to democracy or the reverse. To do this, we employ variables that mark these fundamental changes in the character of the political regimes in state i and/or j. AUTOC→DEMOC equals 1 in years t through t + 5, if one state in a dyad, a "coherent autocracy" (Jaggers and Gurr, 1995) in any year during the five years

TABLE 6. Models of Involvement in Militarized Disputes, 1950–1985: Reconsidering the Effects of Democratization

Variable		*Eqn 8*	*Eqn 9*
Democracy score$_{t-1}$	ß	-0.0613	-0.0611
	$SE_ß$	0.0086	0.0082
	P	<.001	<.001
Democracy score$_{t-11}$		0.0285	0.0305
		0.0058	0.0056
		<.001	<.001
Economic growth rate$_{t-1}$		-0.0213	0.0294
		0.0101	0.0092
		.03	.001
Allies		-0.746	-0.708
		0.090	0.085
		<.001	<.001
Contiguity		1.52	1.50
		0.09	0.08
		<.001	<.001
Capability ratio		-0.00253	-0.00263
		0.00042	0.00040
		<.001	<.001
Dyadic trade-to-GDP ratio$_{t-1}$		-90.7	-85.1
		16.8	15.6
		<.001	<.001
Trend, dyadic trade-to-GDP ratio$_{t-11}$		-7.26	-8.48
		3.33	2.93
		.03	.004
Autocracy-to-democracy transition		-0.0844	
		0.3485	
		.81	
Democracy-to-autocracy transition		-0.163	
		0.238	
		.49	
Change toward democracy			0.0045
			0.0286
			.88
Change toward autocracy			-0.0324
			0.0248
			.19
Constant		-3.60	-3.60
		0.10	0.10
		<.001	<.001
Chi^2		695.68	761.33
P of chi^2		<.0001	<.0001
Log likelihood		-2960.53	-3215.04
N		18,380	19,772

from t–5 through t–1, adopted democratic institutions in year t; AUTOC→DEMOC equals 2 if both states made such a transition; it is 0 otherwise. DEMOC→AUTOC is analogous; it indicates the number of states that changed from democracy to autocracy over a five-year period; and its effect, too, persists for five years, provided a transition to autocracy was not reversed. To assess the dangers of dramatic regime changes, we add AUTOC→DEMOC and DEMOC→AUTOC to equation (6) and reestimate the coefficients.

The results (equation (8), not shown) are reported in Table 6. We find no indication that a dramatic change in regime type, either from autocracy to democracy or the reverse, carries an added risk of dyadic conflict. The coefficients of both AUTOC→DEMOC ($p < .81$) and DEMOC→AUTOC ($p < .49$) are negative, but far from statistical significance. The other coefficients in equation (8) change little when these two variables are added, as can be seen by comparing the middle column in Table 4 with the first column in Table 6. Nor is the insignificance of the two measures of dramatic political transitions sensitive to the specification of the test. Even when the two terms are entered without the variables from equation (6), neither coefficient is statistically significant.[15] In sum, we find no evidence that dramatic political transitions increase the risk of international conflict.

A dramatic change from autocracy to full-fledged democracy is uncommon, even over a five-year period. Only 212 of our 18,380 cases are coded 1 on the variable AUTOC→DEMOC; and the transitions themselves were confined to just eight states. Most political change is a more gradual process. There are more than two and a half times as many transitions from a mixed-regime type, or "anocracy" (Gurr, Jaggers, and Moore, 1989), to democracy as from autocracy to democracy. To reduce the chance that we are wrongly rejecting a true hypothesis, we next estimate the effect of regime change on the incidence of disputes using annual, ordinal measures. DEMOC_CHG indicates movement within a dyad toward greater democracy. It is the sum of any changes, year t-1 to year t, toward the democratic end of the DEMOC→AUTOC continuum by the members of a dyad. If neither state altered its political institutions or they became more autocratic, DEMOC_CHG equals 0. Conversely, AUTOC_CHG equals the sum of the states' movement toward greater autocracy; it will be greater than 0 if either or both members of a dyad became more autocratic. AUTOC_CHG equals 0 if neither state altered its political institutions or they both became more democratic.

We added DEMOC_CHG and AUTOC_CHG to equation (6) and estimated the coefficients (equation (9), not shown). These are reported in Table 6. Again, there is no significant evidence that movement toward democracy, by creating greater opportunity for jingoistic politics, increases the danger of dyadic conflict. Thus, there seems to be no need to supplement our explanation of "dangerous dyads" by taking into account the longevity of regimes. The influence of political institutions on the likelihood of a militarized dispute appears to be fully captured by the dyadic members' current DEMOC→AUTOC scores.

Conclusion

Over the years, liberals have claimed that democracy and free trade not only increase individual liberty and prosperity but also ameliorate international conflict. Our analyses of the Cold War era indicate they were right. The pacific benefits of

[15] In analyses using earlier versions of the COW dispute data, we found that DEMOC→AUTOC and AUTOC→DEMOC were statistically significant when analyzed in isolation. As in the results reported here, however, neither variable was significant when added to equation (6). This indicates that Mansfield and Snyder's original analyses need to be replicated with the latest dispute data.

interdependence are evident in all our tests. Higher levels of economically important trade, as indicated by the bilateral trade-to-GDP ratio, are associated with lower incidences of militarized interstate disputes and war, even controlling for potentially confounding, theoretically interesting influences: geographic contiguity, the balance of power, alliance bonds, and economic growth rates. Economic openness (the total trade-to-GDP ratio), too, is inversely related to the likelihood of dyadic conflict. This second result is important for three reasons: first, it suggests that states recognize that militarized disputes have serious consequences for their economic relations with third parties. Consequently, even limited bilateral trade and investment does not mean that states are unconstrained by economic forces from taking military action. Second, though democratic states tend to trade more than autocratic states, it is clear that both aspects of the liberals' agenda make independent contributions to the prospects for peace. Third, the significance and substantive importance of openness as a predictor of peaceful relations reduces the chance that the causal link between bilateral trade and peace runs only from politics to economics. Deteriorating political relations may cause a state to reduce its dependence on a potential adversary, but it would be much harder to affect the total trade-to-GDP ratio by restricting economic ties with all states simultaneously. The short-term trend in dyadic interdependence, too, is significantly associated with conflict. Militarized disputes are most likely when states are unhampered by important external economic relations and when their importance is declining.

Our analyses clearly reveal the separate peace among democratic states. Unlike previous dyadic studies, we did not create a measure of joint democracy by combining states' individual regime scores. Instead, we adopted the weak-link assumption, reasoning that the likelihood of conflict is primarily a function of the freedom for military action of the less-constrained state. With this improved specification, we found strong support for the democratic peace. In all our analyses, the probability of a dispute is strongly associated with the continuous measure of the political character of the less-democratic state. This resolves the anomaly in Oneal et al. (1996), where a dichotomous measure of regime type was more strongly associated with peace than was the continuous measure. Autocratic governments, lacking the checks and balances of democratic institutions and norms that encourage the peaceful resolution of conflict, are primarily responsible for setting the tenor of their interstate relations, as the international interactions model (Bueno de Mesquita and Lalman, 1992) suggests. As Waltz (1959:238) put it, if each state's actions depend upon those of potential rivals, "then the Hitlers determine in part the action, or better reaction, of those whose ends are worthy and whose means are fastidious."

Interstate relations are not determined solely by the political character of the less-democratic state in each dyad, however. The likelihood of conflict is also influenced by the political distance that separates states. An autocracy and a democracy are not simply as prone to conflict as two autocratic regimes; they are substantially more inclined to violence. Logistic regression analysis, in which the probability of an event occurring is estimated, permits these findings to be starkly illustrated: the annual probability of conflict for a typical contiguous dyad, based on the estimated coefficients for equation (7), is .086. The likelihood of a dispute between two autocracies, all else being equal, is .071; it is .137 for an autocracy and a democracy. The strength of the democratic peace is indicated by the relatively low probability of a dispute, .054, between two democracies. The dramatic effect of interdependence, too, is easily shown. A one-standard-deviation increase in the dyad's lower bilateral trade-to-GDP ratio reduces the probability of a dispute from the baseline value of .086 to .045.

During the Cold War era at least, not only was there a separate peace among democratic states but democracies were more peaceful than autocracies generally. This contravenes the conventional wisdom that democracies fight as often as

nondemocracies; but it follows from the fact that, while democratic and autocratic states are prone to conflict, the likelihood of a dispute is lower for two democracies than for two autocracies, ceteris paribus. Previous efforts to measure the peacefulness of democracies at the national level of analysis were incompletely specified. Whether, for some particular historical period, democratic regimes are involved in as many conflicts as autocracies hinges on the number and character of the political regimes with which these states share a border, their capability ratios, the pattern of alliances, and so forth. If most democracies are isolated from one another and bordered by many autocratic states—as in much of the nineteenth century—they will have high rates of conflict; and the less apparent will be the pacific benefits of democratic institutions at the national level of analysis. In short, simply calculating the average number of disputes for democratic and autocratic states over some period of time yields answers that are historically contingent. New research on other periods not characterized by bipolarity (before World War II, and, eventually, after the Cold War), controlling for political distance, is clearly required. Only then can the underlying propensity of democratic and autocratic states for conflict be reliably estimated. The particular animosity between autocracies and democracies and the greater danger of conflict for contiguous dyads also explains how, at the systemic level, conflict and the number of democratic states can, to a point of inflection, simultaneously increase (Maoz, 1996; Gleditsch and Hegre, 1997).

Ultimately, it may be possible to combine our account of the liberal peace with the expected-utility theory of war to create a unified explanation of interstate conflict. According to expected-utility theory (Bueno de Mesquita, 1981; Bueno de Mesquita and Lalman, 1992), the decision to threaten or use military force is a function of the utilities each state assigns to winning and losing a confrontation with its rival, the two states' relative power, and other factors. Bueno de Mesquita and his associates have measured utility by comparing states' portfolios of alliances; but as they have noted, the benefit of prevailing over a rival is the opportunity it provides to change the opponent's foreign and domestic policies. It hardly needs to be said that the domestic policies of autocracies and democracies are substantially and, in many regards, inherently different. Alliances should not be considered a privileged indicator of states' interests (Farber and Gowa, 1995), which may well derive from similar domestic political systems and the mutual benefits of trade. Moreover, their political and economic interests are likely to be reflected in shared memberships and cooperative behavior in intergovernmental organizations (Russett and Oneal, 1997). Future research should seek to clarify the calculations of political decision makers regarding these issues. Perhaps political distance along the democracy–autocracy continuum will prove a good indicator of the utility associated with states' efforts to influence the domestic policies of others, while alliance portfolios and memberships and voting patterns in international organizations (Gartzke, 1996) may reveal more the value of changing the other's foreign policies (Oneal and Russett, 1997). Furthermore, economic interdependence is likely to prove a good measure of the value two states place on the status quo. If so, this would remedy a notable weakness in the application of expected-utility theory to the study of international relations.

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