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How the Wealth of Nations Conditions the Liberal Peace

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Over the past decade the liberal peace — the finding that democracy and economic interdependence contribute to peace among nations — has emerged as one of the strongest and most important results in the scientific study of international relations. Recent research indicates, however, that the pacific benefits of democracy and interdependence may not be unconditional but contingent upon the wealth of nations. We assess the independent and conditional influences of democracy, interdependence and economic development on the likelihood of fatal militarized disputes over the period 1885 to 1992. Economically important trade has an independent, substantively important pacifying effect, but the conflict-reducing effect of democracy depends on the level of economic development. If the less developed state in a dyad has a per capita GDP below 1400USD, joint democracy is not a significant force for peace. Our results indicate that the vast majority of past research on the democratic peace is imperfectly specified because the character of states' political institutions alone does not account for the likelihood of military conflict. To advance further the cause of peace, we must encourage increased global trade and development along with democratic institutions.

KEY WORDS ♦ democracy ♦ development ♦ globalization ♦ interdependence ♦ interstate conflict ♦ markets ♦ peace ♦ war ♦ wealth

Over the past 20 years numerous studies have investigated the effects of economic interdependence and democracy on the likelihood of interstate conflict. Using a variety of samples, measures and statistical procedures, scores of researchers report that democracies are more pacific than other pairs of states.[1] More recently, evidence has mounted that economically

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important trade also significantly increases the prospects for peace.[2] Recent studies, however, have challenged the presence of these direct, unconditional effects of interdependence and democracy. Hegre (2000) finds that the pacifying impact of trade is contingent on both states having achieved a degree of economic development; and Mousseau (2000) reports that the strength of the democratic peace, too, is conditional on economic development. These results suggest that the effects of democracy and interdependence are more complex than previous research has indicated — the liberal peace is not unconditional but contingent upon the wealth of nations. In addition, the pacific benefit of trade may depend upon the political character of states, as Gelpi and Grieco (2000) report.

Clarifying the conditional effects of democracy, interdependence and development on interstate conflict is important (Mansfield and Pollins, 2001). If the democratic peace depends upon states having developed economies, simply encouraging democracy in poor countries will fail to secure the peace; instead, efforts must also be made to promote economic development. If interstate trade fosters peace only between rich or democratic states, then efforts by Western states to promote peaceful relations with China by encouraging commercial relations will fail and may create a more formidable rival, though trade may promote development and democracy in the longer term. In general, examining the conditional effects of democracy, economically important trade and development on interstate conflict reveals more clearly the consequences of globalization and the nature of the post-Cold War world.

In this article we refine our understanding of the liberal peace by addressing these contingent relations simultaneously. We consider the relations of pairs of states over the period 1885–1992, focusing on those dyads that are most prone to conflict. For the Cold War period, we use newly created trade data (Gleditsch, 2002) that include flows within the Soviet bloc. This allows us to determine whether previous studies (Oneal and Russett, 1999a, 1999b; Russett and Oneal, 2001), using the trade statistics of the International Monetary Fund, were biased by this important omission. First, however, we briefly review the literature regarding the independent effects of democracy, interdependence and economic development. Next, we present theoretical arguments regarding the three conditional effects we consider — the interactions between democracy and development, interdependence and development, and democracy and interdependence.

The Independent Effects of Trade, Democracy and Development on War and Peace

Classical liberals have long held that democratic nations will be more peaceful than autocracies due to the rational preferences of voters (Kant, 1991[1795]), the system of checks and balances that limit the prerogatives of the executive (Morgan and Campbell, 1991) and a political culture that extols the non-violent resolution of conflict (Maoz and Russett, 1993). In addition, liberals have argued that economic interdependence encourages peace because it increases the costs of war, rendering conflict with a trading partner irrational (Angell, 1938[1910]). The First World War called into question the pacific benefits of economic relations, however; and soon after the Second World War, realists made scathing attacks on the peacefulness of democracies in reaction to English and French acquiescence at Munich in the division of democratic Czechoslovakia (Carr, 1946; Morgenthau, 1985[1948]). Encouraged by the pervasive character of the Cold War, the next generation of scholars all but abandoned the belief that democracy and close economic ties significantly influence the prospects for peace. Though both elements of liberalism exerted some continuing influence through integration theory (Deutsch et al., 1957) and functionalism (Mitrany, 1966), realists disputed the pacifying impact of trade, arguing that it is a source of insecurity and conflict, and claimed that democracies of necessity were as responsive to the dictates of power politics as non-democratic states (Waltz, 1979).

In the last decade of the Cold War, several scholars turned their attention back to the possibility that interdependence or democracy might have important pacific benefits. In seminal articles, Polachek (1980) showed in dyadic analyses that trade and conflict were inversely related, and Rummel (1979) reported that democratic states were less likely to fight one another than were other pairs of states. Subsequent studies have demonstrated that neither finding is apt to be the consequence of confounding factors (Bremer, 1992, 1993; Maoz and Russett, 1992, 1993; Oneal et al., 1996; Oneal and Russett, 1999b) or statistical misspecification (Oneal and Russett, 1999a; Raknerud and Hegre, 1997). Gartzke (1998, 2000) finds that the similarity of states' preferences (measured by UN roll-call voting) explains part of the democratic peace; but democratic pairs have a lower probability of conflict even when controlling for preferences, and states' preferences may be shaped by the character of their political regimes. Neither is it likely that the direction of causality runs from the character of interstate relations to the political institutions of states. While some studies report some simultaneity (James et al., 1999), this reciprocal influence appears weak (Mousseau and Shi, 1999; Oneal and Russett, 2000), despite Lasswell's (1941) concern that

conflict could lead to a 'garrison state'.[3] Simultaneity does exist in the trade–war relationship (Anderton and Carter, 2001; Reuveny and Kang, 1996); nevertheless, trade significantly increases the prospects for peace (Kim, 1998; Oneal, 2003; Oneal and Russett, 1997; Russett and Oneal, 2001; Oneal, Russett and Berbaum, 2003). While a small number of studies have called into question the liberal peace (Barbieri, 1996; Beck et al., 1998; Farber and Gowa, 1995; Gasiorowski, 1986; Green et al., 2001), they have been superseded by more recent analyses that find clear support for the pacifying influences of both democracy and interdependence (Beck, 2003; Bennett and Stam, 2000a; Gartzke et al., 2001; Gleditsch, 2002; King and Zeng, 2001; Kinsella and Russett, 2002; Oneal and Russett, 1999a, 1999b, 2000, 2001; Raknerud and Hegre, 1997; Russett and Oneal, 2001).

The classical liberals generally believed that economic development, too, promotes peace. Kant, for instance, argued that 'the *spirit of commerce* sooner or later takes hold of every people, and it cannot exist side by side with war' (1991[1795]: 114). Then, financial success assumes greater importance to a nation than military might. Similarly, Angell was convinced that war 'belongs to a state of development out of which we have passed' (1938 [1910]: 115). Socialists at the turn of the century did not agree. Hobson (1965[1902]) and Lenin (1964[1916]) traced the 'taproot of imperialism' to the requirements of advanced capitalism. In a less ideological vein, Choucri and North (1975) noted that economic development is characterized by increased volume and increased diversification in both the inputs and outputs of production. This generates 'lateral pressure' as states exercise influence abroad in search of raw materials and markets. As this occurred simultaneously in various advanced countries, the prospects for interstate crises and war increased. Choucri and North found support for their theory using data from the late 19th and early 20th centuries when lateral pressure took the form of territorial expansion, especially in the scramble for Africa. The First World War, in their view, was at least in part a consequence, not of capitalism per se, but of development and the growing European population.

Economic development not only influences the motivation of states for using force, it also affects the means by which they advance their interests. It certainly is a cost-effective way of increasing their military capabilities (Milward, 1977; Mueller, 1989); but whether a substantial military advantage leads to conquest or obviates the necessity for the actual use of force, because the weak are forced to accommodate the demands of the powerful, has been debated for centuries. The weight of evidence in recent empirical research indicates that it is an equal balance of power that is more dangerous — a preponderance of power promotes peace, if not justice (Bremer, 1992, 1993; Lemke and Kugler, 1996).

Rosecrance (1986) has noted, however, that the advanced technologies associated with economic development also make trade an alternative, non-violent strategy for acquiring resources and markets. The feasibility of a commercial strategy is primarily a function of barriers to trade and investment and the costs of transportation and communication. Tariff and customs levels may be independent of the level of development, but transportation and communication costs clearly are not. The opportunities for trade increase with the development of appropriate technologies and with investment in infrastructure, such as roads, railways and ports.

Finally, economic development affects the costs associated with interstate violence. War waged on territory with the vast investments in plants equipment and infrastructure associated with development is apt to be costly in absolute terms, and it is likely to destroy a larger fraction of a state's productive resources than war fought on less developed territory. This increases the expected costs of war for a political leader contemplating the use of force, at least if there is any risk that the war will be fought on his own territory.

Whether development leads to conquest or commerce also depends on the benefits associated with seizing territory by force. Rosecrance (1986), like Angell (1938[1910]) earlier, concludes that the net benefit of occupying populated territory decreases with its level of development. An advanced economy is characterized by a complex division of labor, a greater role in production for capital and an educated workforce. Military occupation can be used to secure access to natural resources but is less efficient if the goal is to gain control over capital and skilled labor. Both may flee aggression; and even a successful conqueror will be more dependent on the cooperation of the populace when a country is developed. The availability of capital for production, too, depends on confidence that the governing authority will not confiscate wealth, confidence an occupying power will have difficulty instilling (Brooks, 1999: 657). Thus, holding constant the balance of military forces, liberals generally expect peace to be more likely when both states are developed; but the effect is equivocal. Development increases the value of the contested territory (Liberman, 1993), while it decreases the fraction of resources that are apt to remain intact after the war.

Statistical analyses provide limited support for Rosecrance's position. Bremer (1992, 1993) and Maoz and Russett (1992, 1993) report that joint development does significantly reduce the probability of conflict between nations; but as Bremer noted, a measure of economic development serves in part as a proxy for economic interdependence. When the effect of interdependence is assessed directly by including the trade-to-GDP ratio in the analysis of interstate conflict, pairs of wealthy states are not significantly more peaceful than those less well off (Oneal et al., 1996). Indeed,

Mousseau (2000) found that the independent effect of joint development, controlling for interdependence, is to increase the likelihood of dyadic conflict.

Interstate trade, democracy and development are linked in classical liberal theories; and these linkages have become even more pronounced as a result of contemporary research. Since Lipset's classic study (1959), it has become well established that democracies tend to have developed economies. More recently Burkhart and Lewis-Beck (1994), using vector autoregression, have shown that it is development that causally influences the political character of states — democracy does not appear to have much influence on economic growth (Alesina and Perotti, 1994; Barro, 1997; Przeworski and Limongi, 1993). Democracies are, however, more likely than other states to trade with one another (Bliss and Russett, 1998; Mansfield et al., 2000; Russett and Oneal, 2001); and economic openness is strongly associated with growth (Barro, 1997; Levine and Renelt, 1992; Sala-i-Martin, 1997).

Because of the empirical linkages connecting democracy, trade and development, a number of scholars have brought development into their explanations for the pacifying impacts of trade and democracy. Weede (1996), for instance, combines the liberal position that interstate trade promotes economic development with the finding that development encourages the creation of democratic institutions. He concludes, therefore, that the democratic peace is largely a consequence of the trading relations among developed states. Brawley (1993), on the other hand, argues that democracy causes peace by encouraging interdependence. Democratic governments seek fewer rents (Lake, 1992) and thus have stronger economies. Consequently, democracies trade more with one another and, since trade reduces the incentive for conflict, enjoy a separate peace. Finally, Doyle (1986) interprets Schumpeter's argument that capitalism is a force for peace as a consequence of capitalism leading to both democracy and free trade, both of which lead to peace.

All of these theorists start with the notion that economic development promotes peace, but end with trade or democracy as the actual influence on interstate relations — thus, the impact of development is indirect. In addition, all three suggest that trade, democracy and development are so closely associated that the presence (or absence) of one strongly predicts the presence (or absence) of the others. This implicit assumption, while common, is misleading. Trade, democracy and development are theoretically distinct concepts; and none is a sufficient cause of another. There are, for example, poor democracies that do not trade very much (India), wealthy states that are not democratic (the oil-rich kingdoms) and wealthy states with limited trade (the COMECON nations).

Confusion is most pronounced with trade and development. Trade is a

dyadic relation, while development is fundamentally an attribute of individual nations. Moreover, while the wealthy democracies account for most of the world's volume of trade, arguments for a pacifying impact of trade rest almost entirely on the economic importance of trade, or trade dependence, as indicated by the ratio of trade to gross domestic product (GDP). Despite the large volume of trade among them, the developed market-oriented democracies also have the largest economies, rendering the bilateral trade-to-GDP ratios among these states lower than might first be expected. In fact, the correlation between interdependence and joint economic development in the analyses below is only .26; interdependence and democracy are correlated at .26, and democracy and development at .47.

In sum, democracy, interdependence, and economic development — though empirically related — are theoretically distinct. Liberals have argued that each makes an independent, direct contribution to peaceful interstate relations. Democratic nations are less war-like due to the rational preferences of voters, international trade and foreign investment render war prohibitively costly, and developed economies are more subject to disruption making conflict counter-productive. An abundance of evidence favors the first two positions adopted by liberals; there is little support for the independent, conflict-suppressing effect of development. Recent studies (Hegre, 2000; Mousseau, 2000) suggest, however, that the impact of democracy and trade may be conditional on both states having developed economies. In addition, the pacific benefits of democracy and trade may also be contingent — interdependent democracies may be particularly peaceful pairs of states (Gelpi and Grieco, 2000). The next section reviews the theory and evidence present in the literature for these conditional expectations.

The Interactive Effect of Democracy and Development

Drawing on research in sociology, anthropology and economics, Mousseau (2000, 2002a, 2002b; 2003a, 2003b) shows how a developed market economy can give rise to liberal values, and these values may in turn stabilize democracy and promote peace among developed democracies. Sociologists and economic historians have long identified two primary kinds of economic exchange — gift-giving and contracts (Polanyi, 1957[1944]; Sahlins, 1972; Tandy and Neale, 1994: 19–20). In economies characterized by gift-giving, such as feudal Europe, economic cooperation is based on reciprocity; relationships are initiated and solidified with gifts. Patrons (e.g. lords, dons) have more to give than others, but they also receive gifts as expressions of loyalty in implicit exchange for jobs, protection and other sorts of long-term benefits (Gregory, 1983; Prasad, 1999). Since economic cooperation typically occurs within reciprocating in-groups, compared to economies in

which contracts regulate exchange, gift-giving economies are insular, often based on kinship and ethnicity, and organized hierarchically.

A contract, on the other hand, is an explicit voluntary agreement by two or more parties to do something they would not otherwise do. Contracting prevails in developed market economies, where the widespread use of contracts makes self-interested behavior socially acceptable and extends the range of individuals with whom economic relations can be established. This has important implications — if a society allows wide latitude in contracting parties, then it must value individual freedom. In addition, since all parties to a contract are obligated in common, contracts impose an equitable relationship among the cooperating parties (Booth, 1994; Inglehart, 1990: 46) and, since contracts impose no long-lasting social obligation, strangers and even enemies can cooperate in prescribed ways. No social obligation is implied. Again the implications are profound — the norm of cooperating with strangers on the basis of contractural equality is the logical prerequisite for respecting the rule of common law among strangers. Since contracts must be enforced, an economy based on contracts cannot survive without a state that enforces them impartially. Thus, markets develop and liberal values emerge concurrently with the rule of common law and republican-style government (for further discussions, see Mousseau, 2000: 476–8; 2002a, 2002b; 2003a, 2003b).[4]

This sociological account of the simultaneous emergence of liberal values and democratic institutions should not be confused with liberal ideology. A 'market economy' and a 'free market' are different things — the latter refers to laissez–faire policies of the state, while 'market economy' is the behavioral condition where the majority of people in a society routinely engage in contractual exchange. There is wide latitude in the role of the state in market economies — to facilitate the growth of markets in the modern period, a state with substantial regulatory powers is needed to enforce contracts, promote information symmetry, avert the market-inhibiting concentration of capital and to redistribute wealth to ensure that all individuals have the opportunity to be active in the market. Thus, a social democracy like Sweden, where the majority of economic activity occurs within markets, as well as the United States, is characterized by the liberal values, broadly conceived, that emerge from contractual economic activity.

Of course, all societies have some aspects of both gift and contractual exchange; but for contractual exchange to predominate in the industrial era, there must be a complex division of labor in society. This specialization and interdependence produce a high average income.[5] At low levels of development, individuals typically engage in fewer exchanges, and a greater portion of the few large transactions that do occur, including the securing of employment, are less likely to be arranged by contract (with price

determined by supply and demand) than with gifts arranged among in-group members (with price determined by preferential discounts). As a result, Mousseau (2000, 2003a) argues that countries with less developed economies tend to have political cultures characterized by inter-group conflict (strong in-group/out-group feelings), social hierarchy and extensive patron–client networks typically characterized as graft and corruption. Countries with developed market economies, in contrast, are characterized by individual freedom and rights, tolerance, equity and the rule of common law.

Sociologists and economic historians have long noted the association of gift-giving and contracting norms with collectivist and individualist value orientations, respectively (Braudel, 1979: 63; Durkheim, 1984[1893]); Polanyi, 1957[1944]; Tandy and Neale, 1994: 19–20). Anthropologists and archaeologists consider economic conditions to be a leading influence on cultural mores and institutional structures (Harris, 2001[1979]; Margolis, 2001). Theorists of rational choice recognize that values affect social behavior (see Keohane, 2001: 6–7), and many scholars agree that a stable democratic system requires a liberal political culture (Almond and Verba, 1963; Dahl, 1989; Huntington, 1984; Lipset, 1959). In addition, the observable chain of causation is well established — evidence convincingly links economic development with liberal values (Braudel, 1979; Hofstede, 2001; Inglehart and Baker, 2000). It is also well established that economic development stabilizes democracy (Przeworski and Limongi, 1997). In fact, there is no historical case of an institutional democracy with a high per capita income where the majority of adults did not engage primarily in contractual exchange to obtain their incomes and consumer goods — economically developed democracies are *market* democracies.[6]

The implications of markets for international politics are straightforward if it is assumed that democratic leaders value tenure in office and pay close attention to the preferences of the median voter (Bueno de Mesquita et al., 1999; Kant, 1991[1795]). If the median voter in developed democracies has liberal values and the median voter in less developed democracies does not, only the elected leaders of the developed democracies are likely to share liberal values and have the political incentive to behave liberally in foreign policy. In this way, among developed democracies but not others, the common liberal values of the electorates constrain leaders to pursue common aims in foreign affairs — to respect and promote international law, human rights and an equitable global order. While tactics for achieving these aims may vary among these states, and some governments may be less institutionally constrained than others, on the fundamentals — notions of right and wrong and the proper global order — these states profoundly agree. When minor conflicts do arise, shared common law is used to settle them, or new arrangements are negotiated; the use of military coercion is

not seriously considered. These states do not fear one another and are not trapped in the security dilemma. Between developed democracies and other states, including poor democracies, however, interactions occur as they do between non-democratic states, for in anarchy without common liberal preferences or respect for common law, coercion is a tool for settling differences. Indeed, the results in Mousseau (2000, 2002a, 2003b) indicate that the democratic peace prevails only among developed democracies and that these states are exceptionally cooperative and share preferences on a variety of global issues.

The Interactive Effect of Interdependence and Development

Choucri and North (1975) argued that economic development might increase the incentives for territorial expansion. Economically advanced states may be tempted to seek control of territory through the use of force because of their need for markets and resources and because development allows for the acquisition of greater military capabilities. Thus, developed states may be less peaceful than non-developed ones. Rosecrance (1986), however, suggests that trade is an alternative way to get access to these resources and markets. Drawing on this, Hegre (2000) argues that if development is accompanied by increased trade, the dangerous aspects of 'lateral pressure' should be more than offset by the opportunity for acquiring resources and markets without the costs of military conflict. If not, then economic development may lead to more military conflict.

Indeed, the pacific benefits of trade and development should be mutually reinforcing. Advanced technologies render trade more efficient as a means for acquiring resources and markets (Rosecrance, 1986). At the same time, modern production is increasingly characterized by intra-firm trade and production lines spread over several countries (Brooks, 1999). The production of final goods is often dependent on intermediate goods imported from other countries. It is less easy to find substitutes for these manufactured constituents of production than for raw materials; consequently, a country's dependence on trade is higher when it is developed.

In addition, as the level of development increases, the diversity of materials used, and even the sheer magnitude of the quantities consumed and the size of the markets needed, weighs against a military strategy. The increased diversity of inputs increases the amount of new territory needed for self-sufficiency. Development may provide the motive and means for a state to seize a particular territory from another by force, but it also increases its dependence on third parties. War hampers trade with third parties either because of political reactions or because the heightened risk resulting from conflict increases the price of traded goods. Since world conquest is an

unrealistic scenario for any state, the constraints imposed on developed states by their increased trade with a great number of other nations is apt to outweigh the prospect of gaining control over one particular territory. Supportive of this view, Hegre (2000) reports that the pacifying impact of trade may be conditional to higher levels of development.

The Interactive Effect of Democracy and Interdependence

In addition to the role that development might play in qualifying the consequences of economic interdependence, attention has also been given to the possibility that the political character of states is important in this regard. Certainly, democracy implies civilian control of the government and an ability to restrain the military, whose interests might be better served by the aggressive use of force. Papayoanou (1996), for example, attributes Britain's inability to deter the German invasion of Belgium and France in 1914 to the differential political influence of those involved in British–German commerce on decision-making in London and Berlin. In Britain, the civilian leadership was hesitant to endanger economic ties with Germany because of their importance to the politically powerful business sector. In contrast, Germany's decision-makers were less constrained from using force because of the greater influence of the military in these deliberations.

Oneal et al. (1996), too, noted that commerce might be a particularly powerful constraint on the use of military force when combined with democratic institutions. The political and economic freedom characteristic of democracy allows individuals to form strong transnational associations and to influence policy in light of the resulting interests (Risse-Kappen, 1995; Verdier, 1994). Thus, social and political relations could bolster the influence of economic interdependence on leaders' decisions to use or abstain from using military force. Indeed, Deutsch et al. (1957) argued many years earlier that democracy is conducive to the sorts of cross-national linkages that can result in the formation of a 'security community', where the use of force by one state against another is no longer considered an option. Despite these rationales, however, Oneal et al. found only independent, not conditional, effects of democracy and interdependence on the likelihood of military conflict.

Recently Gelpi and Grieco (2000), drawing upon the work of Bueno de Mesquita et al. (1999), developed a more formal account of how democracy might enhance the pacifying effect of international commerce. Jungblut (2000) makes a similar argument, and both report statistical tests consistent with this view. If political leaders wish to remain in office, they will choose policies designed to achieve this objective. The nature of these policies is influenced by two characteristics of the polity — the number of people who

participate in the selection of national leaders and the size of the minimum winning coalition necessary to win or retain office. Democracies have large 'selectorates' and large winning coalitions compared to autocracies. Democratic leaders, therefore, are less able to provide private benefits directly to their supporters than are autocrats; instead, democratic leaders seek to remain in power by adopting policies that benefit the country as a whole.

This picture of politics has important implications for how national leaders evaluate the economic costs of disrupting commerce by using force. Because the benefits of interdependence are spread broadly, democratic leaders will be more concerned than autocrats to avoid disruptive interstate conflicts. Autocratic leaders have a greater ability to insulate themselves and the relatively small number of individuals upon whom they are politically dependent from the economic costs of using force. In this view, Saddam Hussein withstood the consequences of fighting and losing the first Gulf War because he was able to provide private goods to a sufficient number of the political leadership and the military to maintain his dictatorship. In sum, interdependence may more effectively constrain democratic leaders from using force because they are particularly dependent on broad-based political support, support generated by the economic growth these commercial ties encourage.

Trade may also be especially important in limiting conflict between democracies because the international agreements on which it rests are the result of domestic bargaining within a complex system of checks and balances. Being the consequence of an intricate political process gives them a degree of durability and influence that international agreements by autocracies lack. Executives in democratic countries must persuade and accommodate other powerful groups — the legislature, their political party, interest groups, the public — when negotiating abroad, so they are more likely to abide by their international commitments and respect the resulting transnational commercial relations than are non-democratic leaders whose power is less subject to domestic political constraints (Martin, 2000).

Research Design

The Historical Domain and Sample of Cases

Over the past 10 years the scientific study of International Relations has progressed rapidly by examining the interaction of pairs of states through time (Bremer, 1992). Here we identify the 'dangerous dyads' using logistic regression analyses of the onset of fatal militarized disputes, 1885–1992, in a pooled cross-sectional time-series design. Thus, we examine the effects of democracy, economic interdependence and development over a long period before the Cold War and a few years after. All but the first year of the First

and Second World Wars are omitted because bilateral trade data are fragmentary. The immediate postwar years, 1919–20 and 1946–9, are excluded for the same reason. Omitting all but the first year of each of the world wars provides assurance that our results are not determined by these dramatic but atypical events (Farber and Gowa, 1997).

While there is widespread agreement that pooled dyadic research has been productive, there is disagreement on how best to resolve several methodological problems. One point of contention regards the sample of dyads that should be studied. Many advocate including all dyads formed by pairing each state in the system with all others in each year; others suggest focusing on a subset of cases that are particularly prone to violence. Maoz and Russett (1992) introduced the practice of observing 'politically relevant' dyads — those pairs that are directly contiguous, share a border because of political dependences or consist of at least one major power. With this sample, researchers could concentrate on the relatively small population of dyads 'where the presence or absence of economic and political conditions can affect the *a-priori* high probability of conflict' (p. 249).

Here we focus on relations among the politically relevant pairs of states, though we report analyses with other sets of cases in an appendix. At issue in choosing to study the politically relevant dyads is the representativeness of the sample, the importance of generalizing to the population of all pairs of states, and practical matters of computational power and the availability of data.

Analyzing just the contiguous and major-power dyads has several advantages. First is computational ease. We have just under 40,000 cases when we consider the politically relevant dyads; there are more than 263,000 observations when all pairs are analyzed. In addition, data regarding bilateral trade are better for this subset of states. The International Monetary Fund (IMF, 1997), the most important source of this information, does not consistently report the absence of trade between states. In most cases, zero values are simply omitted; but it is difficult to determine conclusively whether 'missing data' indicate that there was no trade (or a negligibly small amount) or the data are truly missing. Limiting the study to politically relevant dyads minimizes this problem because most states trade primarily with their neighbors and the major powers so fewer of these data go unreported. Finally, studying politically relevant dyads is less sensitive to problems caused by the increase in the number of states from 1885 to 1992 (see the note to Table A2.2).

The principal reason that we focus on the politically relevant dyads, however, is that it substantially increases the proportion of the cases from the pre–1950 years. Farber and Gowa (1997) and others have argued that the democratic peace is limited to the Cold War era and reflects not the

particular peacefulness of democracies but the consequences of that bipolar confrontation. By using the politically relevant pairs, 30 percent of our cases are drawn from the pre-First World War years, which were characterized by multipolarity (Waltz, 1979). If all possible pairs are used, this drops to 13 percent. Such a small number of cases from the earlier period would limit our confidence in generalizing our results beyond the Cold War period.

Use of the politically relevant dyads is not uncontroversial, however. Analyzing this set of conflict-prone states is, in effect, selecting cases based on the value of the dependent variable. Accordingly, the sample is not representative of the population of all possible pairs of states (Reed, 1998). The counter-argument to this is simple — the risk of fatal conflict in the 'non-relevant' population is so small that the non-representativeness of the sample is less important than the enhanced precision gained in assessing the probability of conflict when this is important as a practical matter (Gleditsch and Hegre, 1997; Gleditsch and Ward, 1999; Oneal and Russett, 1999a). In fact, the probability of a fatal dispute among the politically relevant dyads is 35 times that of the non-relevant set of cases. Moreover, one can reasonably doubt whether the absence of military conflict between small, remote countries — Burma and Paraguay, for example — really depends upon the political and economic factors we consider. Nor does the danger of bias seem as great as once thought (Lemke and Reed, 2001) or depend upon the precise definition of 'political relevance' (Gates and McLaughlin, 1996).[7]

We do not intend to settle this issue here, but decisions regarding sampling were potentially of particular importance for our study because of the collinearity of the variables central to our interest — democracy, interdependence and development — and their interactive terms. This might have rendered the results sensitive to the set of cases analyzed (Mousseau, 2000), but in fact our results are stable across these samples. We focus our attention on the politically relevant dyads but report in Appendix 2 analyses of all possible pairs of states and of the contiguous dyads alone.

Definitions of Variables and Sources of Data

Most of our variables and data are those used by Russett and Oneal (2001), which can be consulted for additional information. There are two important differences. First, we use Maoz's (1999) new dyadic militarized interstate disputes dataset to identify fatal uses of force. Second, we measure economic interdependence for the period 1950–92 with Gleditsch's (2002) data. These are more complete than any used previously because Gleditsch consulted a number of sources in addition to the IMF in order to minimize missing data. Most importantly, dyads within the Soviet bloc are included; with the exception of Hegre (2000), previous analyses of economic

interdependence were limited to pairs of states that included at least one member of the IMF.

Dependent Variable: Onset of a Fatal Militarized Dispute. The Correlates of War (COW) project has identified militarized interstate disputes, 1816–1992, and assembled information regarding the dispute and the participants (Jones et al., 1996). A small number of these disputes are multilateral, and Maoz (1999) points out that states on opposite sides in a multilateral dispute may never have directly threatened, displayed or used force against one another. For example, Bulgaria and Japan are listed on opposite sides in the First World War, but there is no evidence that they were directly engaged in conflict. Consequently, we use Maoz's dispute data to identify those dyads where the states actually confronted one another. We consider the onset of fatal disputes, rather than every threat, demonstration or use of force, to reduce the bias in the reporting of these lesser incidents. The use of force at even a low level in Western Europe, e.g. rifle fire across an international border, would not go unreported in the western media from which the COW data are gleaned; such incidents in Africa often go unnoticed. Our dependent variable 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.

Democracy. We use the Polity III data (Jaggers and Gurr, 1995, 1996) to compute a summary measure of the political character of regimes, subtracting from each country's score on the democracy scale its score on the autocracy scale. The resulting variable ranges from – 10 for an extreme autocracy to +10 for the most democratic states. Because a dispute can result from the actions of a single state, the likelihood of conflict is assumed to be primarily a function of the degree of constraint experienced by the less constrained state in each dyad. That state is the weak-link in the chain of peaceful relations (Dixon, 1994). The less democratic state in a dyad determines, therefore, the danger of interstate violence — the more democratic this state, the more constrained from engaging in a dispute it will be, and the more peaceful the dyad. The weak-link assumption is consistent with recent findings that the probabilities of a dispute for autocratic–autocratic and autocratic–democratic pairs are equal, while democratic dyads are significantly more peaceful (Russett and Oneal, 2001).

To reduce the collinearity between our key variables — democracy, interdependence and development — and their interaction terms, we centered each constituent term on its median. Thus, we calculated the lower democracy score and subtracted its median value. Then we divided the resultant by the standard deviation of the uncentered variable. This produces

the variable Democracy_L. Dividing by the standard deviation eases interpretation of the estimated coefficients.

Economic Interdependence. For most pairs of states in the post-Second World War era, the measurement of interdependence is straightforward because the IMF (1997) reports statistics regarding bilateral trade. As noted earlier, however, the Fund publishes data only for its members and their trading partners, so statistics for trade within COMECON, the Soviet economic zone, are unavailable. Even the IMF's information on its members is incomplete. Israel and Syria, for example, report nothing about trade with each other because they do not acknowledge one another's existence. To avoid these problems we use the data assembled by Gleditsch (2002), which has been drawn from the IMF, Faber and Nierop (1989) for the Soviet bloc, and other sources.[8] For earlier years, going back to 1885, bilateral trade data are harder to acquire. For the years 1920–38, we use the data on bilateral trade in current values and the exchange rates compiled by the League of Nations (various years). Before the First World War, the annual editions of *The Statesman's Yearbook* (Epstein, 1913) are the closest approximation to an official source for this economic information.[9]

Since trade is expected to influence dyadic relations only if it is economically (and hence politically) important, we divide the sum of a country's exports and imports with its partner by its GDP. For 1950–92, these data, too, are taken from Gleditsch (2002), who relied upon Summers et al. (1995) and the Central Intelligence Agency (1998). No comprehensive collection of GDP data exists for the pre–1950 era, but Angus Maddison (1995) provides estimates of per capita GDPs for 56 countries in all regions of the world for 1870–1992 that provide the basis for estimating average incomes (per capita GDP) and economic size (GDP) for many other countries.[10] The measure of the economic importance of trade, then, is

$$Depend_{i,t} = \left(\frac{Exports_{ij,t} + Imports_{ij,t}}{GDP_{i,t}} \right).$$

As with the influence of democratic institutions, we expect the likelihood of a dispute to be a function of the freedom of the less constrained state to use military force. This is indicated by the bilateral trade-to-GDP ratio of the state less economically dependent on trade with its dyadic partner. Previous research indicates that the higher trade-to-GDP does not influence the probability that force will be used (Oneal and Russett, 1999a). As with (Democracy_L), we centered this variable and normalized by its standard deviation to produce our measure of interdependence, Dependence_L.[11]

Economic Development. We use average incomes, as indicated by per capita gross domestic products, to indicate the level of development. Using the lower value of GDPpc distinguishes pairs of developed states from dyads containing at least one less developed country. Gleditsch (2002) and Maddison (1995) are again our sources for these data. After taking the natural logarithm, we centered and normalized Development_{L} to reduce collinearity and to ease the interpretation of our logistic regression analyses.

Capability Ratio. Realists emphasize the importance of the balance of power in determining the character of interstate relations. The belief that an equal distribution of power deters conflict has deep historical roots, as does the idea that a preponderance of capabilities, by reducing uncertainty as to which side would win a contest of arms, is more likely to preserve the peace. Recent empirical work suggests, however, that it is preponderance that deters military action (Bremer, 1992, 1993; Lemke and Kugler, 1996). Our index of relative power (Capability Ratio) is the natural logarithm of the ratio of the stronger state's military capability index to that of the weaker member in each dyad. We use the COW project's data (Singer and Small, 1995) on population, industry and military forces to calculate the military capabilities of states.

Alliance. Allies are thought to fight each other less than other states because they share common security interests. They often share other political and economic interests as well. We control for this influence using a variable (Allies) obtained from Singer (1995), that equals 1 if the members of a dyad were linked by a mutual defense treaty, neutrality pact or entente; it equals 0 otherwise.[12]

Contiguity and Distance. The potential for interstate violence exists when at least one member of a dyad can reach the other with effective military force. For most states, the ability to do so, especially the farther back one goes in history, is determined foremost by geographic proximity. Furthermore, neighbors are likely to have the most reasons to fight — over territorial boundaries, natural resources, irredentism, etc. Thus, distance reduces the capability to fight and most of the incentives to do so as well, a finding that is extremely strong in previous research. Because of the importance of this influence, we include two different terms in our regression analyses to capture it as fully as possible. The variable Distance is the natural logarithm of the great circle distance in miles between the two states' capitals (or major ports for the largest countries); using the logarithm acknowledges a declining marginal effect. We also include Contiguity, a measure that equals

1 if two states are directly or indirectly contiguous (via colonies or other dependencies). It equals 0 if they do not share a land boundary or are separated by more than 150 miles of water. Because of widespread colonial empires for much of the period we analyze, these two measures are not highly correlated ($r = -.67$), especially prior to the First World War.

Major Powers. The effect of distance in constraining conflict, however, is less for the great powers — those with the land, sea or (in the last half-century) air capability to deliver substantial forces or destructive power globally. These major powers have been identified by the COW project based on the consensus of historians. To give full opportunity for the realists' concerns to affect our results, we add a third variable, Major Powers, coded 1 if a dyad includes at least one great power; it equals zero if both states are minor powers.

Brevity of Peace and Past Dispute. Beck, Katz and Tucker (1998) have urged that researchers using logistic regression take into account temporal dependence in the time series. States previously involved in a dispute are more likely to become engaged in military conflict in the current period. We follow Beck et al.'s suggestion and include a function of the number of years the dyad has maintained peaceful relations. Beck et al. use a spline function of the 'peace years' to model the temporal dependence. In practice, the result is similar to a decaying function (see Beck et al., 1998: Fig. 1). Hence, we adopt the more parsimonious model recommended by Raknerud and Hegre (1997). The Brevity of Peace variable is an exponential function of the years that have passed without a fatal militarized dispute; it equals $2^{(-y/5)}$, where y is the number of years in peace. This functional form implies that the influence of a dispute decays through time with a half-life of five years. We also note, using the variable Past Dispute, whether the spell of peace years was initiated by a fatal dispute or by one of the two states gaining independence. Our expectation is that states whose historic relations began with a dispute are more likely to fight subsequently.

Results

In this section we evaluate the conditional effects of democracy, interdependence and economic development on the likelihood of a fatal militarized dispute, 1885–1992. We use logistic analyses of pooled time series focusing our attention on the politically relevant dyads — contiguous states and pairs that include at least one major power. To allow for heteroskedasticity and autocorrelation, we report robust standard errors that take into account the dyadic character of our data.

We begin by estimating a model that allows only for independent effects

Table 1
Logistic Regression Estimates, Fatal Disputes, Politically Relevant Dyads, No Interaction Terms 1885–1992

Variable	$\hat{\beta}$	s.e.	*p*-value
Democracy_L	– .35	.11	.0020
Dependency_L	– .38	.15	.0100
Development_L	– .06	.10	.5520
Ln(Capability ratio)	– .37	.06	< .0001
Major Power	.77	.23	.0010
Alliance	– .37	.24	.1230
Contiguity	1.37	.22	< .0001
Ln(Distance between states)	– .27	.11	.0170
Brevity of peace (5-year half-life)	2.56	.26	< .0001
Past dispute	1.88	.32	< .0001
Constant	– 3.78	.89	< .0001
N		39,584	
Log likelihood		– 1322.30	

Note: The standard errors are computed using the Huber/White sandwich estimator (StataCorp., 1997: 235–9); two-tailed tests of statistical significance are reported.

of the three liberal variables of special interest. This provides a baseline against which to compare the result of models that include the three interactive terms — $\text{Democracy}_L \times \text{Development}_L$, $\text{Dependency}_L \times \text{Development}_L$, $\text{Democracy}_L \times \text{Dependency}_L$. The results of estimating the baseline model, given in Table 1, are consistent with the majority of previous empirical evaluations of the liberal peace. The coefficients for Democracy_L (– .35; $p < .002$) and Dependency_L (– .38; $p < .01$) are both negative and very significant, but the coefficient for Development_L (– .06) is far from being statistically significant ($p < .55$).

The relative magnitude of the effects of the three variables can be inferred by comparing their coefficients, because each variable has been centered and normalized by its standard deviation. Consequently the coefficients indicate the effect, in logit units, of a one standard deviation change, holding all other variables constant. Joint democracy and economically important trade have important pacifying effects on the likelihood of interstate conflict; economic development is not a substantively important influence once the benefits of interdependence are explicitly taken into account. It is important to recall that Gleditsch's (2002) data include economic statistics for pairs of states from within the Soviet bloc. The results reported in Table 1 show that including this important set of cases does not alter previous findings

Table 2
Logistic Regression Estimates, Fatal Disputes, Politically Relevant Dyads, 1885–1992

Variable	Model 1 With All Interaction Terms $\hat{\beta}$	s.e.	*p*-value	Model 2 With only Democracy × Development $\hat{\beta}$	s.e.	*p*-value
Democracy_L	– .29	.13	.0240	– .27	.10	.0090
Dependency_L	– .38	.18	.0380	– .34	.14	.0180
Development_L	.00	.11	.9840	– .02	.10	.8210
$\text{Democracy}_L \times \text{Development}_L$	– .32	.10	.0020	– .33	.09	< .0001
$\text{Development}_L \times \text{Dependence}_L$	– .08	.14	.5700			
$\text{Democracy}_L \times \text{Dependence}_L$	.06	.13	.6410			
Ln(Capability ratio)	– .36	.06	< .0001	– .37	.06	< .0001
Major Power	.84	.22	< .0001	.85	.23	< .0001
Alliance	– .26	.23	.2590	– .27	.23	.2420
Contiguity	1.38	.22	< .0001	1.38	.22	< .0001
Ln(Distance between states)	– .29	.12	.0130	– .29	.12	.0140
Brevity of peace (5-year half-life)	2.49	.26	< .0001	2.50	.26	< .0001
Past dispute	1.83	.29	< .0001	1.83	.29	< .0001
Constant	– 3.73	.90	< .0001	– 3.74	.90	< .0001
N	39,584			39,584		
Log likelihood	– 1316.09			– 1316.32		

Note: The standard errors are computed using the Huber/White sandwich estimator (StataCorp., 1997: 235–9); two-tailed tests of statistical significance are reported.

regarding the benefits of democracy and interdependence. Using Gleditsch's (2002) data also removes any doubt that evidence for the significant effect of interdependence depends upon the assumption made regarding missing data in the IMF's *Direction of Trade* (Oneal and Russett, 1999a).

The other variables of theoretical interest also perform as expected in light of previous research — major power status and geographical contiguity significantly increase the probability of conflict, while a preponderance of power, an alliance and greater geographic distance reduce it. As expected, the likelihood of a fatal dispute is affected by the dyad's history of conflict — states that have recently been involved in a dispute and those whose historic relations began with a dispute are more likely to fight.

Next, we add all three interactive terms to the baseline analysis (Table 2).

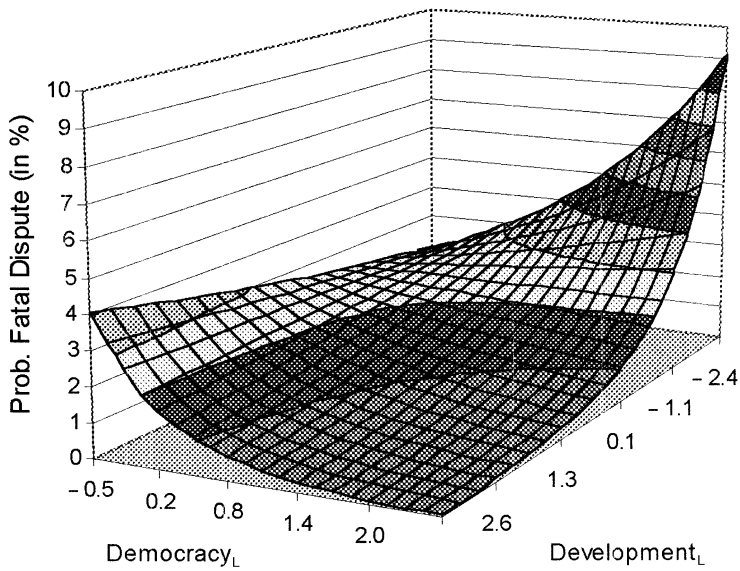
This provides a level playing field upon which to evaluate the independent and conditional effects of joint democracy, interdependence and economic development on militarized conflict. As can be seen in model 1, only one of the three interactive terms is negative and statistically significant: the coefficient for $\text{Democracy}_L \times \text{Development}_L$ (– .32, p = .002). The coefficient for $\text{Development}_L \times \text{Dependence}_L$ is negative as predicted (– .08), but not significant (p = .57). The coefficient for $\text{Democracy}_L \times \text{Dependence}_L$ is positive (.06) and insignificant (p = .64). Analyses of all possible pairs of states and of just the contiguous dyads yield very similar results, as can be seen in Appendix 2.

The statistical insignificance of the coefficients for $\text{Development}_L \times \text{Dependence}_L$ and $\text{Democracy}_L \times \text{Dependence}_L$ indicate that a more parsimonious model is possible. In the second model in Table 2 we report the estimated coefficients of this simpler specification, in which these two interactive terms have been eliminated. As can be seen, the coefficient for $\text{Democracy}_L \times \text{Development}_L$ is now even more significant (– .33, p < .0001). A log-likelihood ratio test confirms that model 1 in Table 2 is not preferable to model 2 (p = .79). On the other hand, model 2 provides a significantly better account of the effects of joint democracy, interdependence, and joint development on militarized conflict than does the baseline model reported in Table 1 (p = .0005).

That model 2 is better means that the pacifying impact of joint democracy is conditional on the level of development, and estimates of the pacific benefit of democracy without the interactive term are under-specified (Friedrich, 1982). The pacific benefit of economically important trade, on the other hand, is independent of both the level of development and the character of political institutions. This can be seen with the coefficient for Dependency_L in model 2, which is negative and significant (– .34, p = .018). In real terms, this indicates that, *ceteris paribus*, a one-standard deviation increase in interdependence results in a net reduction of 29 percent in the probability of a fatal dispute. More importantly for the purposes of this article, this pacifying impact of interdependence appears to hold regardless of a dyad's level of democracy or development.

The coefficient for Democracy_L (– .27) in model 2 in Table 2 is also significant at the .01 level, but, because of the significance of the coefficient for $\text{Democracy}_L \times \text{Development}_L$, this estimated effect and significance level apply only when the interactive term equals zero, i.e. when Development_L is at its median. A significance test based on conditional standard errors (see Friedrich, 1982: 810) indicates that the estimate for Democracy_L is significantly less than zero (α = .05, two-tailed test) only for dyads with Development_L higher than 1400 USD per capita.[13] In our complete sample, 9 percent of jointly democratic dyad-years (defined as a Polity score > 6) are

Figure 1
Estimated Impact of Joint Democracy Across Varying Economic Conditions on the Probability of Fatal Dispute



below this level of development, and were thus excluded from the democratic peace. It is important to note, however, that none of the democracies in 1992 were that poor. An average income of 1400 USD is about the level of Zimbabwe in 1992.

In Figure 1 we report the estimated effects of joint democracy on the probability of a fatal dispute across varying values of joint development. In graphing Figure 1 we have set Dependence$_L$ at the median value; we have also assumed that the dyad is composed of contiguous non-allied states, at least one of which is a major power, and that the capability ratio, distance between capitals and time since the last conflict are at their averages. The vertical axis in Figure 1 shows the estimated annual probability of a fatal militarized conflict. The right horizontal axis represents the level of development of the less developed state; the left axis identifies the level of democracy of the less democratic state (both variables are standardized). The endpoints of each axis correspond approximately to the 5th and 95th percentiles. The contour lines and the different shadings connect combinations of values for the variables with the same probabilities of conflict.

As can be seen in Figure 1, for dyads where at least one state has a low level of development (back-right axis), joint democracy is estimated to *increase* the probability of serious interstate conflict. The estimated annual probability of a fatal dispute increases from just under 2 percent for dyads where at least one state is highly autocratic (back-corner) to just over 9 percent if both states are highly democratic (right-corner). Mousseau's (2000) argument suggests that this may be a consequence of insular clientalist values in less developed countries, with elected leaders under domestic constraint to pursue privileges of the national in-group over outsiders. However, further tests (see Appendix 1) indicate that the negative impact of democracy is not statistically significant within the observed range of values for joint development.

Similarly, we can also see in Figure 1 that for dyads where at least one state has low levels of democracy (back-left axis), joint development increases the likelihood of a fatal dispute. The estimated annual probability of a fatal dispute increases from just under 2 percent for dyads where at least one state is very poor (back-corner) to just over 4 percent if both states have highly developed economies (left-corner). This may be due to the imperialist tendencies of illiberal — state directed — development unconstrained by liberal democracy. Examples would include the fascist and communist states, whose economies are integrated not through the market but by the state, and the gift-integrated but oil-rich feudal monarchies.

Add democracy to development, however, and we get quite a different picture. Among economically developed states (front-left axis) we see democracy's pacifying effect — the probability of a fatal dispute drops from about 4 percent (left-corner) to about .05 percent (front corner) — a reduction of 99 percent. Overall, the conditional relationship of democracy and development on militarized conflict can be seen in the shape of the contour lines, which form a downward-sloping curve around the jointly democratic, jointly developed front corner of the figure.

In sum, it appears that development in the absence of democracy and democracy in the absence of development do not result in peaceful interstate relations. Democracy with development, in contrast, appears to be a robust pacifying condition, while economic interdependence has a robust pacifying impact independent of a dyad's levels of democracy or development. These results indicate that the classical liberals are only partly right — trade does indeed have direct pacifying benefits, but, separately, democracy and development do not. Rather, the pacifying benefits of democracy and development occur only when both are present. This result corroborates the expectations of Mousseau's (2000) model of liberal political culture arising from economic development. In fact, further tests yielded additional support for this model — Mousseau claims that the liberal culture associated with

development fosters the formation of alliances among developed democracies, and thus alliances should not be included as a control variable (2000: 488). The results of estimating model 2, presented in Table 2, confirm this expectation — the Alliance coefficient is insignificant.

Whereas all of our tests yielded no substantive support for an interaction between democracy and interdependence, we did find limited support for Rosecrance's (1986) predicted conditional relationship of interdependence with development (Hegre, 2000). On the sample of the Cold War period (1950 to 1992), the coefficient for $\text{Dependency}_L \times \text{Development}_L$ does approach significance.[14] Nevertheless, the results for this term are clearly less robust than those for the democracy–development interaction, which remained significant across all of our tests.

Conclusions

In this article, we have reconsidered the independent and conditional influences of democracy, interdependence and economic development on the likelihood of fatal interstate disputes, 1885–1992. The evidence we have presented shows that the liberal peace is conditioned in important ways by the wealth of nations. Whereas economically important trade has important pacifying benefits for all dyads, the conflict-reducing effect of democracy is conditional on states' economic development. If at least one democratic state in a dyad has a GDP per capita of 1400 USD or less, joint democracy is not a significant force for peace. Fortunately, this level of income is low enough that most democratic dyads in our sample, 91 percent, are in the zone of peace at usual thresholds of statistical significance; and all democratic dyads exceed this threshold in 1992. Nevertheless, the strength of democracy's pacifying effect varies with the level of development. Peace is most secure among the economically advanced democracies. These results corroborate the previous research of Mousseau (2000) and indicate that the vast majority of past studies of the democratic peace are under-specified. These results are also consistent with what Hegre (2003) found for internal armed conflicts: democracy reduces the risks of civil war only for middle- and high-income countries. Careful attention must be paid to the conditional influence of democracy in future research.

Our results carry important implications for grasping the liberal peace. Apparently, the classical liberals were only partly right — interdependence does indeed have direct pacifying effects, but the benefits of democracy and development are mutually conditioned. This mutual conditionality fits the expectations of Mousseau's model (2003b) of the rise of markets as the source of liberal values and institutions. Institutionally constrained to pursue liberal values of individual rights and the rule of law in foreign affairs, the leaders of

market democracies share a common vision of the proper global order and methods of resolving conflict. In this way, the market democracies have little to fight about (Mousseau, 2003b; see also Gartzke, 1998); and when mutual conflict does arise they resolve it not with coercion but with the shared principles of law and equity (Mousseau, 2000). As reported, survey and other forms of evidence support this view, with the linkage of economic development with liberal values well established (Braudel, 1979; Hofstede, 2001; Inglehart and Baker, 2000).

Further research is necessary, however, to confirm that it is the cultural consequences of markets that explain how development qualifies the effect of democracy on interstate relations. Our results do not allow us to ignore the potential influence of alternative factors associated with development. For one thing, direct economic consequences of developed, democratic markets may also be important. The mobility of capital in market democracies may reduce the incentives for conflict, and market democracy may facilitate efficient signaling of resolve (Gartzke et al., 2001). Moreover, an educated and informed citizenry may be essential to making democratic institutions fully effective in constraining the political leadership, and good systems of education and the free flow of information may be dependent in turn on the availability of adequate resources and communication technologies associated with development. At the same time, endogenous growth theories emphasize the importance of education and 'human capital' in the process of economic development (Barro, 1997; Sala-i-Martin, 1997). In a systematic cross-national study of democratic stability, however, Inglehart (1997) found no support for the role of education when levels of development *or* measures of liberal political culture were considered.

Alternatively, if a certain level of development is necessary for democratic stability (Przeworski et al., 2000), then any factor associated with democratic stability could explain the conditional nature of the democratic peace. One such factor might be perceptions — perhaps the democratic peace rests on expectations that the democratic political system will prevail in the future; economic development might serve as a proxy for this expectation. Another possibility is that democratic regimes with weak economies tend to crumble in the face of external crises, though Mousseau and Shi (1999) found no evidence of democratic regimes breaking down in the periods before wars. Ultimately, any factor associated with democratic stability may offer an alternative explanation for the results reported here, though Mousseau found the economic condition to the democratic peace to be robust after controlling for democratic stability (2000: 499).

The implications of our analyses for public policy seem clear. In recent years the wealthy democracies initiated a new global regime of democratic governance (Schmitter, 1996). The European Union, the North Atlantic

Treaty Organization, the Organization of American States and the British Commonwealth of Nations all impose democratic governance as a condition for membership; some of these organizations allow member states to intervene in each other's internal affairs to protect democratic institutions, and the United Nations Security Council authorized military intervention in Haiti to restore democracy. But if the democratic peace is conditioned by economic development, these efforts at securing democratic governance will not alone produce the expected benefits for poor countries — economic development, too, must be promoted. Since interdependence also contributes to better interstate relations, to advance the cause of peace we should encourage increased global trade and development along with spreading democratic institutions.

Notes

1. See Chan (1997), Maoz (1997, 1998), and Ray (1997, 1998) for reviews of the extensive literature on the democratic peace.
2. For guides to this burgeoning research, see Schneider et al. (2003) and Mansfield and Pollins (2003).
3. Mitchell et al. (1999) even find the systemic average level of democracy to increase in the aftermath of war.
4. Precisely because of the *quid pro quo* nature of contracting, many contracts are written down for clarity and evidence. This is in contrast to reciprocal forms of exchange which, because obligations are only implied, cannot be written down. However, this correlation does not render the relationship axiomatic. Government orders, military commands and interstate treaties (which are made with the backdrop of coercion) are also typically written down, but they are clearly not voluntary agreements that commit parties to do something they would not otherwise do.
5. In the pre-industrial era, both classical Athens (Cameron, 1997: 32–5) and the northern states in the US (Wood, 1998) had inclusive market economies, and both had liberal cultures and institutions.
6. Not all developed states have had market economies, however — the communist and fascist states have been predominantly integrated not by the market (with supply and demand) but by the state; the oil-rich monarchies have been predominantly integrated with patron–client gift-giving. But since these societies are not predicted to have strong liberal values, their autocratic status is expected, and these 'developed' states are not predicted to behave liberally. These cases also illustrate that the use of money does not indicate the ubiquity of contracting in a society. Money, like anything else, can be shared, reciprocated or exchanged in contract.
7. The results of Bennett and Stam's (2000b) tests of Bueno de Mesquita and Lalman's (1992) international interaction game also suggest that focusing on the politically relevant dyads is sensible.
8. After checking alternative sources, Gleditsch (2002) sets any remaining missing

data equal to zero, citing King et al. (2001) who argue that it is better to make reasonable estimates when this is possible. Non-random patterns in the missing values often produce greater bias than omitting relevant variables.

9. Because the data before 1950 are less standardized, the appropriate exchange rates for converting the data to a common unit are less certain, and there are more missing data. Oneal and Russett (1999a) collected alternative estimates for bilateral trade in the 1885–1949 period (Barbieri, 1998; Mitchell, 1981), compared them to the data from *The Statesman's Yearbook* and the League of Nations, and adjusted the data from their principal sources accordingly. By drawing upon all sources, using the data of one state to replace missing data of a trading partner, and interpolating between known values, there are trade data for 61 percent of the dyads 1885–1913 and 1920–38.
10. Maddison's (1995) data were made consistent with and merged with those of Summers et al. (1995). The combined time series, covering the years 1885–1992, were then regressed on estimates of annual energy consumption per capita (Singer and Small, 1995), which is a good correlate of individual incomes (Morgenstern et al., 1973), to estimate missing values. Multiplying these data on per capita GDPs by the population of states provides information on nations' economic size (GDP). For countries for which there were no per capita GDP estimates, the coefficients from the regression analysis of the combined Maddison-Summers et al. time series on per capita energy consumption, data on energy consumption and information regarding the year and the region in which a country is located were used to create estimates of average incomes.
11. A problem with the trade-to-GDP ratio is that it is highly skewed, with small values predominating. Taking the logarithm of the measure would eliminate this skewing and reduce the influence of extreme observations, but taking the logarithm also incorporates a diminishing marginal effect of increased trade relative to GDP. An increase in the trade-to-GDP ratio from 1 percent to 2 percent (or from .001 percent to .002 percent) has the same effect as an increase from 10 percent to 20 percent. The last change, because it is more important economically, should have a more profound impact on a country's relations with its trading partner than the others. Additional analyses we performed with $\ln(\text{Dependence}_L)$ are consistent with this view. Using the logarithm is also problematic because $\ln(0)$ is undefined. This raises difficult questions concerning the treatment of the large number of observations where trade equals zero. When estimating the model without these observations, $\ln(\text{Dependence}_L)$ had the same sign and level of significance as Dependence_L in Table 1, but a larger substantive impact. We also tried adding a fixed value to all observations to allow log-transformation and avoid excluding any observations. The results, however, are so sensitive to the particular value added that these estimates are of limited value; see Oneal and Russett (2001) regarding this problem. When adding USD 100,000, $\ln(\text{Dependence}_L)$ was not significant. The untransformed measure is also problematic to a degree. It implies that the marginal effect on the probability of conflict of increasing trade is constant — increasing the trade-to-GDP ratio from 1 percent to 2 percent is assumed to have the same effect as

increasing from 20 percent to 21 percent. The relative change in the importance of trade is larger in the first case and more likely to alter the rank order of a country's trading partners than the latter. Further research is needed to determine the best functional form with which to represent the effect of economic interdependence.

12. The data in Singer (1995) were updated using Rengger and Campbell (1995).
13. See Appendix 1 for the details of this test.
14. The $\text{Development}_L \times \text{Dependence}_L$ term is also significant and negative in the politically relevant dyads sample when log-transforming Dependence_L and excluding the zero-trade observations.

Appendix 1

Friedrich (1982) suggests that interactive regression models be interpreted in terms of the conditional effect and significance of the variables involved. We report tests of the interactive effects of democracy and development in Table 2 and in Tables A2–1 and A2–2. The regression model can be written as

$$\text{logit(dispute)} = b_1\ \text{dev} + b_2\ \text{dem} + b_3\ \text{dem} \times \text{dev} + \beta X + e$$

where the constant and all other terms are collected in the βX term. Their effects are assumed to be independent of those of democracy and development. This formula can be restated to make explicit the effect of Democracy conditional on Development:

$$\text{logit(dispute)} = b_1\ \text{dev} + (b_2 + b_3 \times \text{dev})\ \text{dem} + \beta X + e$$

Friedrich (1982: 810) shows that the standard error for the term $(b_2 + b_3 \times \text{dev})$ is

$$\sqrt{\text{var}(b_2) + dev^2\ \text{var}(b_3) + 2dev\ \text{cov}(b_2, b_3)}$$

This allows us to identify the range of Development within which a test of the hypothesis that democracy has no independent effect fails to be rejected. This is the case if we cannot reject the hypothesis H_0: $b_2 + b_3 \times \text{dev} = -0.2733 - 0.3415 \times \text{dev} = 0$. The t statistic for this test (Friedrich, 1982: 820) is:

$$t = \frac{-0.2733 - 0.3415dev}{\sqrt{\text{var}(b_2) + dev^2\ \text{var}(b_3) + 2dev\ \text{cov}(b_2, b_3)}}$$
$$= \frac{-0.2733 - 0.3415dev}{\sqrt{0.0109 + dev^2\ (0.00976) + 2dev\ (-0.000089)}}$$

For a two-sided test, $t = -1.65$ is the critical value at the 5% significance level. We may then solve this expression for *dev*. This shows that H_0 is rejected whenever $dev > -0.1905$. Transforming back from the standardized Development variable shows that this is equivalent to a per capita income of USD 1385. In dyad-years where at least one of the two states has a GDP per capita below this threshold, increasing Democracy does not significantly reduce the probability of a fatal dispute.

Appendix 2

Table A2-1
Logistic Regression Estimates, Fatal Disputes, Contiguous Dyads Only, 1885–1992

	Model 1 With All Interaction Terms			Model 2 With only Democracy × Development		
Variable	$\hat{\beta}$	s.e.	*p*-value	$\hat{\beta}$	s.e.	*p*-value
Democracy low	−.18	.15	.219	−.18	.12	.133
Dependence low	−.58	.31	.057	−.57	.23	.015
Ln(development) low	−.07	.13	.59	−.08	.12	.531
Democracy × Development	−.41	.12	.001	−.41	.11	<.0005
Development × Dependence	−.04	.22	.87			
Democracy × Dependence	−.02	.24	.93			
Ln(Capability ratio)	−.39	.08	<.0005	−.39	.08	<.0005
Major Power	.88	.24	<.0005	.88	.24	<.0005
Alliance	−.24	.24	.328	−.24	.24	.326
Ln(Distance between states)	−.29	.14	.033	−.29	.14	.034
Brevity of peace (5-year half-life)	2.67	.30	<.0005	2.67	.30	<.0005
Past dispute	1.69	.32	<.0005	1.69	.32	<.0005
Constant	−2.46	.95		−2.46	.95	
N	14,296			14,296		
Log likelihood	−932.98			−933.00		

Note: The standard errors are computed using the Huber/White sandwich estimator (StataCorp, 1997: 235–9); two-tailed tests of statistical significance are reported.

Table A2-2
Logistic Regression Estimates, Fatal Disputes, All Dyads, 1885–1992

Variable	Model 1 With All Interaction Terms $\hat{\beta}$	s.e.	*p*-value	Model 2 With only Democracy × Development $\hat{\beta}$	s.e.	*p*-value
Democracy low	– .24	.11	.028	– .21	.09	.018
Dependence low	– .20	.09	.022	– .18	.07	.013
Ln(development) low	– .02	.10	.877	– .04	.09	.665
Democracy × Development	– .25	.08	.002	– .25	.07	< .0005
Development × Dependence	– .04	.06	.522			
Democracy × Dependence	.04	.05	.44			
Ln(Capability ratio)	– .34	.06	< .0005	– .35	.06	< .0005
Major Power	.96	.23	< .0005	.97	.23	< .0005
Alliance	– .13	.22	.570	– .14	.22	.53
Contiguity	1.29	.22	< .0005	1.30	.22	< .0005
Ln(Distance between states)	– .36	.11	.001	– .36	.11	< .0005
Brevity of peace (5-year half-life)	2.52	.25	< .0005	2.53	.25	< .0005
Past dispute	1.72	.37	< .0005	1.72	.36	< .0005
System Size	.64	.08	< .0005	.63	.08	< .0005
Constant	– 3.25	.84		– 3.27	.85	
N	262,901			262,901		
Log likelihood	– 1511.81			– 1512.22		

The standard errors are computed using the Huber/White sandwich estimator (StataCorp., 1997: 235–9). The 'System Size' variable corrects for the change in the dyadic probability of conflict due to an increasing number of states. When employing the logistic regression model, we assume that the dyads have a constant probability of conflict (after having controlled for the explanatory variables). However, this cannot be the case when analyzing all dyads. The number of dyads in our data have increased from around 120 in 1885 to more than 13,000 in 1992. This reflects a growing share of 'non-relevant' dyads. If the probability of conflict in this subset of cases were constant, the increase in the number of dyads would lead to a considerable increase in the nation-level probability of conflict even if the probability is very small. There is no evidence of such an increase, which implies that the probability of conflict for non-relevant dyads has decreased. To correct for this, we adapt the 'relevance adjustment' parameter proposed by Raknerud and Hegre (1997) when analyzing all dyads. If no correction for the increase in system size is necessary, this parameter would be estimated to be 0.

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