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Why Democracies Cooperate More and Fight Less: The Relationship Between International Trade and Cooperation

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Abstract

This paper provides an economics-based interpretation of the standard finding in the literature that democracies rarely fight each other. A general theory of conflict between two countries is presented and empirical analysis applies this theory to the question of why democracies rarely fight each other. The results show that the fundamental factor in causing bilateral cooperation is trade. Countries seek to protect wealth gained through international trade, therefore trading partners are less combative than nontrading nations. Democratic dyads trade more than nondemocratic dyads, and thus exhibit less conflict and more cooperation.

1. Introduction

After political scientist Rudolph Rummel (1979, p. 277) cited Babst's 1964 research[1] that "no wars have been fought between independent nations with elective governments" (1964, p. 10), a spate of controversial empirical work evolved attempting to test the proposition that democracies rarely fight each other. Initially there were mixed results. However, in a well-cited political science paper, Chan (1984) rectified the mixed findings on whether democracies deter conflict. His solution was mostly methodological: monadic studies using single countries as the unit of observation failed to support the contention that democracies rarely fight but strong support emerged when using dyads (pairs of countries) as units of observations. Indeed using the Small and Singer (1976) Correlates of War (COW) data, Chan found overwhelming support that "the more libertarian *two* states [are] the less the *mutual* [emphasis mine] violence," while little support emerged that "the more libertarian a [given] state, the less *its* [overall] foreign violence" (Chan, 1984, p. 620). Chan's study thus served as an impetus for a number of dyadic-based tests of the hypothesis.

These studies include Moaz and Abdolali (1989), Levy (1989), Morgan and Campbell (1991), Morgan and Schwebach (1991), Siverson and Emmons (1991), Ray (1992), Ember et al. (1992), Bremer (1992a, 1992b), Russett and Antholis (1992), Moaz and Russett (1993), Bremer (1993), and Farber and Gowa (1994). Noteworthy among these studies is the consistency of the findings; so much so that Levy (1989, p. 270) called the "democracies rarely fight" phenomena a "law," and Bremer indicated that a panel of leading political scientists "gave unanimous support to the proposition" (Bremer, 1992b, p. 1).

Political scientists have two theories to explain why democracies rarely fight each other.[2] The first theory is billed as "cultural–normative," and the second as "structural." In reality both are related because in part structural determinants are possibly culturally induced. Cultural–normative theories are based on Kant (1795), Wright

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(1942), and Doyle (1986), and advanced by Russett (1989) and others. They claim that adjudication and bargaining are so embedded within democratic societal norms that democracies are able to solve disputes peacefully, especially with other democracies (though the logic is a bit murky as to why democracies don't do better against nondemocracies, as well). Structural theories, espoused by Morgan and Campbell (1991), and based on Rummel (1979), Hagan (1987), Domke (1988), and Bueno de Mesquita and Lalman (1992), argue that there are so many checks and balances in the democratic decision process that making the decision to fight is difficult and not taken lightly. Nondemocracies such as dictatorships need less justification to go to war.

To an economist both theories seem *ad hoc*, and neither are based on economics principles. The point of this paper is to provide an economics-based interpretation to these results. I begin with a general theory of conflict between two countries and then illustrate how to apply this theory to the question of why democracies rarely fight each other. The results show that the fundamental factor in causing bilateral cooperation is trade. Countries seek to protect wealth gained through international trade, and as a result trading partners are less combative than nontrading nations. Democratic dyads trade more than nondemocratic dyads, and as such exhibit less conflict and more cooperation. Thus, this paper shows a benefit to a liberal trading environment in addition to the traditional classical gains from trade and technology transfer.

2. A Theory of Bilateral Conflict

Take the perspective of a given country, called an actor. Assume that each actor has a given factor endowment not easily changed at least in the short-run. Given these factor endowments, trade patterns emerge; and given these trade patterns, a country is assumed to behave rationally in its foreign relations decisions. Specifically, if conflictive political relations lead to a diminution of trade, then one implicit cost of this conflict is the lost welfare gains associated with trade. The greater the gain from trade, the more costly is conflict. Thus, trade can enhance cooperation and deter conflict.

To illustrate this proposition, begin with classic assumptions used to describe an actor country producing and trading two commodities i (= 1, 2). Let q_i be the production of i and denote the production frontier as $f(q_1, q_2) = K$. Define x_{ij} to be the net exports of q_i to country j, so that a positive x_{ij} implies exports and a negative value implies imports. Domestic consumption $C_i = q_i - \Sigma x_{ij}$. Finally, define the vector $Z = (Z_1, Z_2, \ldots Z_j)$ to represent the actor country's net conflict. A positive Z value denotes conflict and a negative value denotes cooperation.

Hypothesize a social welfare function

$$W = w(c_1, c_2, Z) \equiv w\left(q_1 - \sum_j x_{1j}, q_2 - \sum_j x_{2j}, Z\right) \tag{1}$$

for the decision-maker in the country which is assumed to be derived from the preference sets of the entire population. This function depicts welfare levels associated with each possible consumption basket (c_1, c_2), but is also dependent on $Z \equiv (Z_1, Z_2, \ldots, Z_j)$, the conflict or cooperation toward any of k target countries. For now, assume Z is given, and thus not part of the optimization process. The welfare function is assumed to be quasi-concave such that $w(c_1, c_2, Z)$, $w_{c1} > 0$, $w_{c2} > 0$, but that $w_{c1c1} < 0$ and $w_{c2c2} < 0$. No assumptions are necessary for the effect of Z on welfare levels, since Z is now a constant.

We assume that countries will work to maximize their social welfare function. Of course, there may be exceptions to this rule. Special interest groups may work to limit trade in order to maintain market power. Thus political processes and objectives may work to constrain the ability of countries to maximize welfare.[3] A related theory argues that some groups may benefit from conflict through the building of weapons. These groups may exert pressure on politicians to increase conflict. However, Robbins (1968) finds that special interest groups are unimportant in the formulation of policy with respect to war. Thus the social welfare function is viable.

The very simplest bilateral trade model assumes a combined gain from both production specialization and trade. However, suppose that conflict implies the cessation or at least diminution of trade, for example through quotas, embargoes, or even blockades. Then the implicit cost of conflict is the lost gains from trade associated with decreased trade.[4] Obviously, the greater the welfare loss associated with the diminution of trade the greater the costs of conflict, and hence the smaller the incentive for conflict. Even if conflict does not directly diminish trade, but instead leads to trade restrictions that ultimately affect the terms of trade, the same result applies. In this case less desirable terms of trade result, thereby implying a lower welfare. Again the implicit price of conflict is the lost welfare associated with diminished trade brought about by conflict.

To illustrate these costs of conflict, assume that a component of commodity i's price of international trade (P_i) is dependent on conflict. Thus assume $P_i = P_i(Z)$ (dropping the country subscript) such that $\partial P_i(Z)/\partial Z < 0$. An example is $\text{sign}\partial P_i(Z)/\partial Z = -\text{sign}(x_i)$ implying that conflict lowers the price an actor country receives for exports and raises the price it pays for imports.[5] If conflict leads to the complete cessation of trade through boycotts or embargoes, then $\partial P_i(Z)/\partial Z = -\infty\ \text{sign}(X_i)$.

Given this structure, rational behavior implies a two-step maximization procedure. First, given conflict Z, a country determines optimal production and trade by maximizing welfare subject to balance of trade and production constraints.[6] This implies maximizing Lagrangion ($\mathcal{L}$) as follows:

$$\text{Max}\,\mathcal{L} = w\left(q_1 - x_1,\ q_2 - x_2,\ Z\right) + \lambda_1\left(x_1P_1\left(Z\right) + x_2P_2\left(Z\right)\right) + \lambda_2\left(k - f\left(q_1,\ q_2\right)\right), \quad (2)$$

which upon solving the first-order conditions yields the following solution:

$$\begin{aligned}
q_1^* &= q_1^*\left(P_1\left(Z\right),\ P_2\left(Z\right),\ Z,\ k\right)\\
q_2^* &= q_2^*\left(P_1\left(Z\right),\ P_2\left(Z\right),\ Z,\ k\right)\\
x_1^* &= X_1^*\left(P_1\left(Z\right),\ P_2\left(Z\right),\ Z,\ k\right)\\
x_2^* &= X_2^*\left(P_1\left(Z\right),\ P_2\left(Z\right),\ Z,\ k\right)\\
\lambda_1^* &= \lambda_1^*\left(P_1\left(Z\right),\ P_2\left(Z\right),\ Z,\ k\right)\\
\lambda_2^* &= \lambda_2^*\left(P_1\left(Z\right),\ P_2\left(Z\right),\ Z,\ k\right).
\end{aligned} \quad (3)$$

These equations define optimal welfare for any level of conflict Z:

$$\Psi\left(Z\right) = w\left(q_1^*\left(\cdot\right) - x_1^*\left(\cdot\right),\ q_2^*\left(\cdot\right) - x_2^*\left(\cdot\right),\ Z\right). \quad (4)$$

Next, by taking the first order conditions

$$\Psi_z\left(Z\right) = \left(\partial\mathcal{L}/\partial Z\right) = w_z\left(\cdot\right) + \lambda_1^*\left(x_1^*\left(\partial P_1/\partial Z\right) + x_2^*\left(\partial P_2/\partial Z\right)\right) = 0, \quad (5)$$

one obtains the cost–benefit condition to determine optimal conflict, Z.[7] The bracketed term $(x_1^* \partial P_1/\partial Z + x_2^* \partial P_2/\partial Z)$ is the implicit price for receiving less money from exports while at the same time having to pay more for imports. It represents the net costs of hostility. The term $W_z(\cdot)$ is the welfare benefit of added hostility. In equilibrium an actor just balances these costs and benefits. However, one should note that optimal conflict/cooperation levels still arise even if conflict or cooperation (z) implies no welfare gain (i.e. even when $W_z = 0$). In this case, optimal conflict is based purely on setting the marginal cost of net conflict to zero. Countries with larger imports or exports (x^*) face higher costs of conflict and thus engage in less conflict.[8] This leads to the first proposition.

PROPOSITION 1. *The greater an actor country's trade with a target, the smaller the amount of actor to target conflict.*

If increases in foreign debt are not permitted (especially in the long-run), conflict induces a change in optimal imports and exports. The more unfavorable the relative price of trade induced by conflict, the more greatly exports are forced to increase and/or imports decrease. The exact change can be derived from the maximization of the welfare function with respect to x_1 or x_2. From the above one can show that welfare losses are largest, the more inelastic the import and exports demand and supply curves. Hence we have a second proposition.

PROPOSITION 2. *The more inelastic (elastic) an actor country's import and export demand and supply to a target country, the smaller (larger) the amount of actor to target conflict.*

3. Testing the Bilateral Trade–Conflict Relationship

Past research (Polachek, 1980, 1992; Gasiorowski and Polachek, 1982; Polachek and McDonald, 1992), has produced detailed statistical evidence relating conflict and trade, holding constant other exogenous variables. Rather than repeat that analysis, here I merely highlight the relevant tests of the above two propositions before moving on to apply the model to the "democracies rarely fight question." I first present a detailed description of the data since they will be used later when analyzing democracies. I then present two sets of empirical work: the first looks at Proposition 1 and the second at Proposition 2.

Three datasets are described containing information on (1) bilateral conflict, (2) bilateral trade, and (3) country attributes. Reasons for choosing these datasets are given, but a description of the political interactions data is emphasized since they are more unfamiliar to economists.

Political Interactions Data

I use the Conflict and Peace Data Bank (COPDAB) to depict bilateral political interactions among nation-pairs.[9] COPDAB is an extensive longitudinal collection of about one million daily bilateral political events reported from 48 newspaper sources between 1948 and 1978. These events are coded on a 15-point scale representing different kinds of conflict and cooperation. The annual frequency of events in each category represents the amount of each type of dyadic interaction attributable to an

actor/target dyad. Currently over 105 countries and hence about 11 thousand possible dyadic interaction measures are included for each year.

A possibly significant problem with events data is that they comprise interactions reported only in newspapers. Many secret treaties and negotiations, as well as multicountry interactions not reported in newspapers, are obviously omitted. In addition, newspapers often find certain country pairs more newsworthy so that extreme selectivity biases can exist. The benefit of events data is that they measure cooperation as well as hostility. In addition, actor and target countries can easily be identified. Precise measures of amounts of different kinds of conflict can be ascertained.

Selectivity issues can be controlled by looking at the *relative* conflict, i.e. the frequency of contact *minus* the frequency of cooperation for a pair of countries. This way, under- or over-reporting can be avoided by concentrating not on the absolute frequency of reported events, but instead on the relative amount of conflict, the logic being that reporting biases are more related to the specific country than the type of event. It is presumed that any tastes by newspapers for reporting conflict more readily than cooperation would not be nation-specific so that comparisons of one country pair's relative conflict compared with another would also be unbiased. Accordingly, as will be illustrated in more detail later, I define conflict (NETF) as the frequency of conflictual events (those in categories 9 to 15) minus the frequency of cooperative events (those in categories 1 to 7). Here, a negative value of NETF implies that cooperative interaction exists and a positive value implies a conflictual relationship.

Economic Trade

Aggregate import and export data collected on a country by country directional basis compiled from the International Monetary Fund (IMF) series of annual volumes *Directions of Trade* were used. The trade data are given in US dollars.[10] The trade share matrix methodology outlined by Armington (1969a, 1969b) in conjunction with the IMF World Trade Model (WTM) have been used to compute import and export price elasticities in three merchandise trade categories (manufactured products, agricultural goods, raw materials) for 14 of the largest Organization for Economic Cooperation and Development (OECD) industrial countries.[11]

According to Armington, for any given class of items, such as manufactures, the following relationship holds between various elasticities and market shares:

$$N_{ij} = \left(1 - S_{ij}\right)e_i + S_{ij}n_i, \tag{6}$$

where N_{ij} is the partial elasticity of demand of buyers in the ith country for manufactures produced by the jth country; S_{ij} is the share of the jth country's manufactures in the ith country's total expenditure of manufactures; e_i is the elasticity of substitution in the ith market between manufactures of any pair of countries (including the ith); and n_i is the partial elasticity of demand of buyers in the ith country for manufactures in general, irrespective of the source of supply. When $i \neq j$, then n_{ij} is the ith country's elasticity of import demand from j.

Relationship (6) converts the WTM's n_i, a given country's total elasticity of demand for a given type of good (manufactures, agricultural goods, raw materials), into bilateral elasticities N_{ij}. The shares S_{ij} are calculated from a square matrix of trade of a given type of commodity, using detailed dyadic OECD trade flow information. The elasticity of substitution e_i is calculated using the related estimates available in Marquez (1988).

Attribute Data

Standardizing variables are included to hold constant those factors relating to country levels of development that may exogenously affect trade and conflict. Several international datasets were merged for this purpose. These include *International Financial Statistics* data (containing data on gross domestic product, population, and exchange rate information), the Banks cross-national time-series data (Banks, 1971) (containing information on energy consumption, energy production, percent GDP originating in industry, national income per capita, primary school enrollment, secondary school enrollment, university enrollment, newspaper circulation per capita, physician's per capita), the UN *Statistical and Demographic Yearbook* (containing data on fertility, infant mortality rates, life expectancy, and other demographic data), as well as several other sources.

4. Empirical Tests

Proposition One: Trade and Conflict[12]

The general specification is given by

$$Z_{ij} = \alpha_0 + \alpha_1 x_{ij} + \alpha_2 x_{ij}^2 + \alpha_3 A_i + \alpha_4 A_j + \varepsilon_{ij}, \tag{7}$$

where $Z_{ij} \equiv$ relative conflict of actor country i toward target country j; $x_{ij} \equiv$ exports of actor country i to target country j (the squared x_{ij} term is introduced to test for nonlinearity); $A_i \equiv$ a vector of actor country attributes; $A_j \equiv$ a vector of target country attributes; $\varepsilon_{ij} \equiv$ a random error term assumed to be normally distributed with zero mean.

Coefficients α_1 and α_2 yielding a negative $\partial Z_{ij}/\partial x_{ij}$ would imply that countries with a greater trade dependence engage in less relative conflict. Coefficients α_3 and α_4 which reflect the impact of country attributes on conflict can be thought of as other aspects of the price vector for conflict. This paper, presents only the coefficients α_1 and α_2 and treats the attributes as exogenous identification variables.

A consistent pattern emerges (Table 1). There is a negative and statistically significant trade–conflict relation. The greater the level of trade country pairs engage in, the lower the conflict between them, even when adjusting for country attributes.[13]

Table 1. The Trade–Conflict Relationship[a]

	1958–67	*1948–78*
x	–0.0023	–0.0359
	(9.8)	(22.3)
x^2		1.51×10^{-6}
		(13.9)
ε_{zx}[b]	0.15	0.16

[a] Coefficients from regression $z_{ij} = \alpha_0 + \alpha_1 x_{ij} + \alpha_2 x_{ij}^2 + \alpha_3 A_i + \alpha_4 A_j$, where z_{ij} $\equiv$ net conflict from country i to country j, $x_{ij} \equiv$ exports of country i to country j, $A_i \equiv$ exogenous development variables of country i including variables mentioned in text, and $A_j \equiv$ exogenous development variables of country j. Absolute values of t-statistics are in parentheses.
[b] Computed as $(\partial Z/\partial x) \cdot (\bar{x}/\bar{Z})$.

Table 2. Three-Stage Least-Squares of the Trade–Conflict Relationship

		Dependent variables		
Independent variables		*Net conflict*	*Exports*	*Elasticity*
Constant		–0.77 (–4.3)	–119.02 (–3.4)	
Exports		–0.0045 (–5.8)		0.29
Conflict			1.83 (0.3)	–0.03
Defense	Actor	–0.00018 (–5.6)		
expenditures	Target	–0.00025 (–8.0)		
Population density	Actor	–0.0015 (–3.3)		
	Target	–0.0016 (–3.5)		
GNP	Actor	1×10^{-8} (3.0)	3.3×10^{-7} (3.7)	
	Target	2×10^{-8} (7.3)	1.2×10^{-7} (1.7)	
GDP/GNP	Actor		0.73 (1.5)	
	Target		0.92 (1.6)	
Highway vehicles	Actor		1174.5 (7.4)	
per capita	Target		1002.2 (7.1)	
Secondary school	Actor		0.048 (1.3)	
enrollments	Target		0.076 (2.1)	
Electrical production	Actor		–6.68 (–0.7)	
per capita	Target		0.81 (0.1)	
Annual population	Actor		–0.066 (1.2)	
growth	Target		–0.138 (–2.6)	

Elasticities of conflict with respect to trade (last row) indicate that a 1% increase in trade is associated with a decrease in conflict (increase in cooperation) by between 0.15 and 0.16%. Thus doubling trade between two countries implies that on average there would be a 15–16% decline in the relative frequency of conflict.

To test for causality one could view the trade–conflict relationship as a simultaneous set of equations. In one equation conflict affects trade, while in the other trade affects conflict. In effect both trade and conflict are treated endogenously while country attribute data are used as exogenous factors for identification. To test this endogeneity, three-stage least-squares results are presented in Table 2.

The hypothesized causality is as predicted.[14] An even stronger, more negative coefficient (–0.0045 versus Table 1's –0.0023) is obtained, while a statistically insignificant coefficient is obtained for the impact of conflict on exports. Thus, even when accounting for simultaneity, the causality from trade to conflict remains. Increases in trade diminish conflict. A doubling of trade would reduce conflict by 29%.[15]

Proposition Two: Trade Elasticities and Conflict[16]

The results for the trade–conflict relationship using bilateral trade elasticities for raw materials are shown in Table 3. The raw materials elasticities computed in the WTM did not vary as much as the manufactures elasticities. Also, no elasticities were provided for five out of the 14 countries. Rather than use the dyadic trade elasticities for raw materials that the Armington equation yields, each term of the Armington equation is used separately as two separate explanatory variables.

Table 3. The Conflict–Trade Relationship Using Raw Materials Bilateral Elasticities[a]

Variable	*Mean*	*Coefficient*[b]	*Elasticity*
Constant		–1071.18	
		(1.82)	
Armington's first term: $(1 - S_{ij})$	0.954	916.07	5.46
		(1.54)	
Armington's second term: S_{ij}	0.021	2627.77	0.34
		(3.31)	
Exports to target (millions of $US)	1682.69	–0.041	0.43
		(3.68)	
GDP of the actor (billions of $US)	263.95	0.22	0.36
		(3.68)	
GDP(actor) – GDP(target) (billions of $US)	44.52	–0.136	0.038
		(2.96)	
Net conflict	–160.00		
R^2		0.33	
Observations		111	

[a] To compute the raw-materials dyadic trade elasticities, the trade share matrix contained all trade flows from the SITC sections 2 plus 4, all in millions of $US. SITC 2 is crude materials, inedible, except fuels. SITC 4 is animal and vegetable oils and fats. The data used were FOB export data. A country's total imports of raw materials was converted from CIF import to FOB export using a country-specific conversion factor.
[b] *t*-values appear in parentheses in the coefficients column.

The signs are consistent with the expected hypotheses concerning the effect of trade, factor endowments, and elasticities on net conflict. As before, trade is inversely related to conflict, but the magnitude of the relationship is far stronger than before. A 10% rise in exports leads to a 4% reduction in conflict. Similarly, as predicted the coefficients of both elasticity terms are strongly positive. To enhance the gains-from-trade argument, the difference in actor–target GNP is used as an exogenous proxy for differences in factor endowment. If actor and target GNP differences (GNPDIF) imply actor/target factor endowment differentials, then larger GNPDIF should raise the gains from trade and diminish conflict. The regression result (i.e. the –0.136 coefficient) is consistent with this hypothesis.

5. Why Democracies Cooperate Rather than Fight

I now address the applicability of this model to the "democracies rarely fight amongst each other" question. Before one can proceed, one must explore the available data on what constitutes a democracy, then one would have to show that democratic dyads exhibit greater trade (or greater gains from trade) than nondemocratic dyads, and that as a consequence the greater trade contributes to greater cooperation and less conflict.

Democracy Data

The *Gurr Polity II: Political Structure and Regional Change 1800–1986* dataset is the most complete source for information on democracy, and the one used in this study. The democracy variable is an amalgamation of three independent elements: (1) citizens' abilities to express their preferences to country leaders, (2) checks and balances

on the executive branch, and (3) the degree to which citizens' civil liberties are protected. Gurr provides a composite scale which ranges in value from 0 to 10, with 10 denoting the most democratic country. Table 4 presents democracy scores for 30 countries averaged over the 1958–67 period. One column contains Gurr average democracy scores while another contains a dichotomous democracy index. Of the countries, eight (the USA, Canada, the UK, West Germany, Italy, Israel, Japan, India) have a score of 10 in each year. These are classified as democracies. Five (Libya, Iran, Jordan, Saudi Arabia, Kuwait) have zero scores each year, and obviously these represent nondemocracies in each year.

Democracy, Conflict, and Cooperation

Table 5 verifies that democracies rarely fight each other. Conflict–cooperation scores for each COPDAB conflict–cooperation scale are examined. Almost no extreme SC1 or SC15 events occur in the data, so one cannot look at all-out wars or voluntary

Table 4. Continuous and Dichotomous Indices of Democracy by Country: 1958–67

Country code	*Country*	*Continuous Gurr index*[a]	*Dichotomous Gurr index*
2	USA	10.0	1.0
20	Canada	10.0	1.0
200	UK	10.0	1.0
220	France	6.0	1.0
260	West Germany	10.0	1.0
265	East Germany	1.0	0.0
325	Italy	10.0	1.0
350	Greece	6.3	0.9
352	Cyprus	3.0	0.3
365	USSR	1.0	0.0
600	Morocco	0.7	0.0
315	Algeria	1.0	0.0
616	Tunisia	1.0	0.0
620	Libya	0.0	0.0
625	Sudan	2.4	0.3
630	Iran	0.0	0.0
640	Turkey	8.4	0.9
645	Iraq	1.0	0.0
651	UAR (Egypt)	1.0	0.0
652	Syria	1.8	0.0
660	Lebanon	4.0	0.0
663	Jordan	0.0	0.0
666	Israel	10.0	1.0
670	Saudi Arabia	0.0	0.0
690	Kuwait	0.0	0.0
710	China	1.0	0.0
740	Japan	10.0	1.0
750	India	10.0	1.0
770	Pakistan	3.0	0.3
850	Indonesia	1.8	0.0

[a]The continuous Gurr index must be 5 or higher to be classified as a democracy.

Table 5. Conflict and Trade by Democracy Level: 1958–67

Variable label	*Actor and target democratic*	*Neither democratic*
DEMOC	83.87	0.81
SC1	0	0.0004
SC2	0.09	0.02
SC3	0.35	0.07
SC4	0.57	0.44
SC5	0.79	0.39
SC6	0.88	0.40
SC7	1.90	0.77
SC8	0.15	0.04
SC9	0.60	0.15
SC10	0.52	0.50
SC11	0.10	0.06
SC12	0.04	0.05
SC13	0.007	0.02
SC14	0.02	0.01
SC15	0	0
NETF	–3.41	–1.35
X	301.86	4.47
M	324.66	4.97
RELX	1.37×10^{-6}	6.38×10^{-7}
RELM	1.44×10^{-6}	7.98×10^{-7}

SC1: Nation A unites voluntarily with Nation B to become one nation-state.
SC2: Nations A and B establish international dyadic economic or political alliance; joint military command and maneuvers.
SC3: Nation A extends military aid to B.
SC4: Nation A extends economic aid to B by giving assistance and famine relief or other industrial and economic assistance.
SC5: Nation A establishes friendship, cultural or similar limited agreements.
SC6: Nation A supports B's policies, recognizes B's regime or solicits support of B against a third party.
SC7: Nations A and B communicate, meet or propose talks regarding problems of mutual interest.
SC8: Nations A and B demonstrate indifference to each others policies.
SC9: Nation A expresses mild disaffection towards B's policies.
SC10: Nation A engages in verbal threats.
SC11: Nation A increases its military capabilities and resources to counter Nation B's actions.
SC12: Nation A breaks up diplomatic relations with Nation B.
SC13: Nation A engages in subversion against Nation B.
SC14: Nation A engages in limited hostile acts against Nation B; bombards military units or hits territory of B causing minor costs to B.
SC15: Nation A initiates or engages in very hostile war actions against Nation B and occupies territory of the latter causing battle deaths, dislocations and the capture of soldiers.
NETF: net conflict (as defined in Polachek, *JCR*, 1980).
X: actor exports to target; M: actor imports from target.
RELX: GNP weighted exports; RELM: GNP weighted imports.

unifications. On the other hand, there are ample data on the other events. Take SC14: hostile war acts involving military activity. Democratic dyads (hereafter DD dyads) exhibit a mean of 0.02 (meaning that the average number of limited war acts per dyad-year is 0.02) while dyads with neither side democratic (NN dyads) have a mean of 0.06. (The difference is statistically significant at better than 99%.) Similarly for each conflict event SC10 through SC15, NN dyads exhibit more (actor-to-target) conflict than DD

dyads. What is even more interesting (and what has not been tested before even with other data) is that whereas democracies exhibit less conflict, they simultaneously exhibit *more* cooperation. Compared with NN dyads, DD dyad cooperation values are higher for every category SC2 to SC7 (recall that there are too few voluntary unification SC1 events to yield meaningful results). The summary measure of net conflict (NETF) computed as the number of conflictual events minus the number of cooperative events yields the same results: Democratic dyads exhibit less conflict (–3.41 versus –1.35).

Trade

As was indicated above, to ascertain the role of trade in explaining why democracies rarely fight each other, one must first show that democratic dyads in fact trade more, and second one must show that this greater trade is related to lower amounts of conflict. Table 5 gives four measures of trade. The first two are real dollar values of imports (M) and real dollar values of exports (X), and the second two are imports and exports relative to country GNP (RELM and RELX respectively). Imports average $325 billion and exports $302 billion for democratic dyads but only about $5 billion for non-democratic dyads. Consistent with the above hypothesis, democratic dyads exhibit far greater levels of trade.

Regression analysis yields almost the same story. Column 1 of Table 6 models conflict (NETF) as a function of the continuous democracy score (DEMOC). Consistent with previous findings, the higher the product of each country's Gurr democracy scores (DEMOC), the more democratic the dyad and the lower the level of net conflict (–0.028). Also consistent is the inverse relationship between conflict and trade, since the coefficient for trade (measured here as exports (X)) is significantly negative being –0.003 (column 2). Thus it appears that trade deters conflict as reported above, and more democratic dyads exhibit less conflict. These results are comparable to the mean values reported in Table 5.

One might argue that the negative democracy coefficient is possibly spurious if democracy proxies some other underlying factor. For example, if democracies have greater levels of trade which in turn decrease conflict, then omitting trade from the analysis could cause an omitted variable bias. One way to test for this is to consider whether conflict is jointly determined by democracy as well as trade. If rather than democracy *per se* decreasing conflict, one finds that higher levels of trade cause lower levels of conflict, then the democracy coefficient will become insignificant once one includes trade in the regression model. This is the approach used in column 3 of Table 6.

Table 6. The Impact of Democracy and Trade on Conflict: Continuous Democracy Variable[a]

Variable	*(1) Coefficient*	*(2) Coefficient*	*(3) Coefficient*	*(4) Coefficient*
INTERCEP	–0.90 (–5.3)	–1.01 (–8.1)	–0.91 (–5.3)	–0.82 (–4.8)
DEMOC	–0.028 (–6.7)		–0.014 (–3.2)	–0.003 (–0.7)
X		–0.003(–10.4)	–0.003 (–8.2)	–0.009 (–11.3)
X^2				1.4×10^{-6} (9.4)
R^2	0.01	0.02	0.03	0.04

[a]The dependent variable is NETF; data: COPDAB 1958–67; *t*-values are in parentheses.

Table 7. The Impact of Democracy and Trade on Conflict: Dichotomous Democracy Variable[a]

Variable	*(1) Coefficient*	*(2) Coefficient*	*(3) Coefficient*	*(4) Coefficient*	*(5) Coefficient*
INTERCEP	–1.92 (–8.416)	–1.01 (–8.11)	–1.91 (–8.423)	–1.71 (–9.2)	–3.00 (–10.0)
DEMCAT	–1.51 (–4.182)		–0.48 (–1.256)		0.37 (0.9)
X		–0.003 (–10.39)	–0.003 (–8.225)	–0.003 (–8.5)	–0.003 (–6.8)
GNP-actor				-1.3×10^{-8} (–11.7)	-1.4×10^{-8} (12.5)
GNP-target				7.6×10^{-9} (6.6)	6.5×10^{-9} (2.5)
POP-actor				2.0×10^{-5} (12.4)	2.0×10^{-5} (12.0)
POP-target				4.7×10^{-6} (–2.8)	4.3×10^{-6} (5.0)
R^2	0.025	0.021	0.038	0.08	0.09

[a] The dependent variable: is NETF; data: COPDAB 1958–67; *t*-values are in parentheses. The regressions in columns (1), (3), and (5) also include dummy variables for democracy-nondemocracy and nondemocracy-democracy dyads.

As indicated here, the democracy coefficient decreases in magnitude from –0.028 to –0.014 when trade is introduced linearly, and decreases further to a statistically insignificant –0.003 when trade is introduced in a quadratic form. Thus introducing trade explains away democracy's impact. It is important to note that the trade coefficient both remains exactly the same magnitude and maintains its statistical significance. This is consistent with democracy being a proxy for trade rather than trade for democracy.

The same results emerge using the categorical democracy variable rather than democracy measured continuously. Column 1 of Table 7 models conflict as a function of democracy type. As before, democratic–democratic (DD) dyads exhibit less conflict. The coefficient for DEMCAT is –1.51, indicating less conflict within dyads where both countries are democratic. Adding trade, as in Table 6, reduces the magnitude and statistical significance of the democracy coefficient from –1.51 to –0.48. Here too, it is important to note that the trade coefficient remains exactly the same. Thus again democracy is a proxy for trade rather than the reverse.

Obviously it is possible that trade too might not be an independent factor. Perhaps larger, more developed countries are the ones with greater trade. To test this possibility, column 4 introduces GNP and population for both the actor and target. However, as illustrated in column 4, adding these variables leaves the trade coefficient the same. Introducing the dyadic democracy variables (column 5) raises the dyadic democracy coefficient from –0.48 to +0.37, but leaves unaltered its statistical insignificance. Thus even when accounting explicitly for country size (both in terms of the economy and population) trade decreases dyadic conflict, but democracy pairs no longer exhibit lower levels of conflict. In fact, it could be argued that on controlling for trade and country attributes, democracies seem to exhibit greater conflict.

7. Conclusion

Some claim that merely by being a democracy a country engages in less conflict. Indeed current US foreign policy aimed at democratization seems consistent with this notion. One only need consider the Korean War, the Vietnam War, Grenada, Haiti, or policies towards Cuba to get an idea. This paper shows that democracy *per se* does *not* reduce conflict. Instead a more fundamental factor than being a democracy in causing bilateral cooperation is trade. Countries seek a peaceful means to dispute in order to protect wealth gained through international trade. Thus trading partners are less combative and more cooperative than nontrading nations.

The policy implication of this paper is straightforward. Encouraging free trade tends to decrease conflict and increase cooperation. This is the same message as that from the so-called "liberals" Emeric Cruce, Francois Qesnay, Adam Smith, David Hume, and the British statesmen Cobden and Bright, as well as Baron de Montesquieu (1900, p. 316) who states:

> Peace is the natural effect of trade. Two nations who traffic with each other become reciprocally dependent: for if one has the interest in buying, the other has the interest in selling; and thus their union is founded on the mutual necessities.

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Notes

1. Babst (1964) analyzed Quincy Wright's 1789–1941 and other war data. Also see Babst (1972).
2. See Morgan (1993) and Starr (1992) for an explanation of these two theories.
3. Hillman (1989) surveys the literature on interest group efforts to reduce international trade, while Nitzan (1993) looks at the related rent-seeking literature. A specific example was seen with the corn laws. Agricultural interests in England gained protection from the Napoleonic Wars and were able to maintain this protection through laws long after the hostilities ended

(Schonhardt-Bailey, 1991). Some have also argued that the boycott of Israel is a modern example of where domestic interests gained from the closure of the economy.

4. We assume no direct costs of conflict. However, incorporating direct costs will not alter the results.

5. Note that x is positive when the actor country is a net exporter, and x is negative when the actor is a net importer. $\partial P_i(Z)/\partial Z$ having a sign the opposite of x implies that conflict raises the price of imports and lowers the price of exports.

6. Of course domestic interests that benefit from limiting trade may attempt to reduce social welfare in an attempt to capture available rents. See Nitzan (1993) for a discussion of the rent-seeking literature.

7. Second-order conditions imply $\Psi zz = w_{zz} + \lambda_1^* (x_1^* (\partial^2 P_1)/(\partial Z^2) + x_2^* (\partial^2 P_2)/(\partial Z^2)) < 0$.

8. This can be seen by the following comparative statistics:

$$w_z = -\lambda_1^*\left(x_1^*\left(\partial P_1\right)/\left(\partial Z\right) + x_2^*\left(\partial P_2\right)/\left(\partial Z\right)\right),$$

$$W_{zz}\left(dZ\right)/\left(dx_1\right) = -\lambda_1^*\left(\partial P_1\right)/\left(\partial Z\right) - \lambda_1^*\left(x_1^*\left(\partial^2 P_1\right)/\left(\partial Z^2\right)\right)\left(dZ\right)/\left(dx_1\right) + x_2^*\left(\partial^2 P_2\right)/\left(\partial Z\right)\left(dZ\right)/\left(dx_1\right)\Big),$$

$$\left(\partial Z^*\right)/\left(\partial x_1\right) = -\lambda_1^*\left(\partial P_1\right)/\left(\partial Z\right)/\left(w_{zz} + \lambda_1^*\left(x_1^*\left(\partial^2 P_1\right)/\left(\partial Z^2\right) + x_2^*\left(\partial^2 P_2\right)/\left(\partial Z^2\right)\right)\right) < 0.$$

9. See Azar (1980) for a detailed description of the data. Kegley (1975) contains an analysis of the pros and cons of events data.

10. Gravity models of trade predict that contiguous countries will trade more with each other. However it can be noted that neighboring countries also are more likely to engage in war. My current research is addressing how the distance between countries influences the relationship between trade and conflict, and how this relationship has changed over time.

11. The countries are Austria, Belgium–Luxembourg, Canada, Denmark, France, the Federal Republic of Germany, Italy, Japan, The Netherlands, Norway, Sweden, Switzerland, the United Kingdom, and the United States of America.

12. These results are based on Polachek (1992).

13. The magnitude of the negative relationship varies depending on the country pair. Indeed for some countries there is a positive relationship. My future work will analyze differences in the trade–conflict relationship by country pairs.

14. As noted by a referee, there are several cases where peace has not led to a substantial increase in trade. One possible case may be the peace between Israel and Egypt. Trade also may not have increased dramatically between the former socialist countries and the West after the decline in conflict. Although in both cases there was an increase in trade.

15. See Gasiorowski and Polachek (1982) for time-series Granger causality tests indicating that trade causes cooperation, rather than the reverse.

16. These results are based on Polachek and McDonald (1992).