Commerce and Democracy*

Mohan Penubarti
Department of Political Science
UCLA

Michael D. Ward
Department of Political Science

Working Paper no. 6
Center for Statistics and the Social Sciences
University of Washington

March 9, 2000 version 1.0β

Abstract: In this study, we explore the relationship between democracy and international trade and demonstrate that the link is weak. We base our analysis on a general equilibrium model of international trade as well as on corrected, symmetric measures of bilateral trade flows. Further, we also incorporate spatial dependence among the observations. We argue that previous studies which show that democratic countries are more likely to trade with each other rely on a misspecification of the trade model. Once this misspecification is corrected, democracy is no longer a significant direct influence on bilateral trade flows.

Key Words: international trade, democracy, spatial analysis.

*Paper prepared for the conference "The Development and Application of Spatial Analysis for Political Methodology," University of Colorado, Boulder, 10–12 March 2000. We thank Keith Maskus and Harvey Starr for insightful comments on this version of the paper, which we hope to utilize in our future work.

Les vertus se perdent dans l'intérêt comme les fleuves se perdent dans la mer. Francis, Duc de La Rochefoucauld, *Maximes*, 1665.

1 Introduction

Political scientists have long argued that policy preferences of relevant political agents are reflected in a country's trade policy (Rogowski 1989; Frieden 1991). These preference are filtered through political institutions which both condition the incentives facing domestic political agents and as well as aggregate these preferences to determine policy (Garrett 1995). Therefore, the nature of the political regime is an important determinant of a country's trade regime. For instance, the strength of various actors in the economy, electoral rules, and the independence of the state differ in significant ways in a democracy and a non-democracy. Therefore, the degree of democracy could be an important determinant of international trade policy.

In this study, we explore the relationship between democracy and international trade and demonstrate that the link is weak. We base our analysis on a general equilibrium model of international trade as well as on corrected, symmetric measures of bilateral trade flows. Further, we also incorporate spatial dependence among the observations. We argue that previous studies which show that democratic countries are more likely to trade with each other rely on a misspecification of the trade model. Once this misspecification is corrected, democracy is no longer a significant direct influence on bilateral trade flows.

2 Democracy and international trade

In a recent study, developing upon the now widely accepted link between peace and democracy, Bliss and Russett (1998) argue that a shared polity leads to greater trade between democracies in one of two broad ways: (1) a democratic trading state will feel less threatened that its security will be threatened by trading with another democracy than an autocracy; and (2) private actors in democratic states might prefer trading with those in other democratic states since their international business might be less disrupted due to military conflict. In addition, the rule of law and shared norms among democracies might provide insurance against expropriations and facilitate business transactions (Bliss and Russett 1998). They test their hypothesis with annual regressions from 1962–89 and find broad support that bilateral trade increases as the least democratic of the two trading partners becomes more democratic.

In another line of reasoning, Mansfield, Milner and Rosendorff (1997; 1998) have argued that political regime types of countries are an important factor in international economic cooperation. In all countries, governments are subject to domestic pressures in developing trade policy. In democracies, especially, voters exert control over political leaders who have to face competitive elections. In addition, in all

countries, governments must satisfy influential domestic groups who contribute to the power base (as in autocracies) or political campaigns (as in democracies). However, the interests of these two groups are different and hence governments face a trade off. Consumers (i.e., voters) have a reason to prefer trade liberalization as it increases the consumer surplus. On the other hand, domestic interest groups may be interested in trade barriers to increase the producer surplus. The degree of trade barriers that a government keeps depends on the relative influence of each of these groups. Therefore, reduction of trade barriers lowers the chance of interest group support while increasing the chance of support from voters.

Since political leaders in autocracies do not compete in elections, they place no weight on winning elections. However, political leaders in democracies place a great deal of weight on winning elections, hence the weight attached to voter influence is larger than that given to special interests. Mansfield, Milner and Rosendorff (1998) model the trade interactions between countries as a repeated Prisoners' Dilemma game and show that two democracies are more likely to get into liberalizing trade agreements than mixed (democracy and autocracy) countries. Mixed countries, in turn, tend to engage in more liberalizing trade agreements than two autocracies. They test their hypotheses with data on preferential trading arrangements (PTAs) from 1960 to 1990 and find strong support for their model.

Morrow, Siverson and Tabares (1998) also explore the link between international trade and democracy and find a strong significant relationship between the two. However, all of these studies have a number of drawbacks. First, all of them use an ad hoc model of international trade in which bilateral trade flows are regressed against a number of political and economic variables within the context of a loose fitting gravity model. Others with similar specifications have come to the opposite conclusion on the link between trade and democracy (Barbieri and Schneider 1999). A second problem with all these studies is that they fail to take into account the spatial context of international trade flows, a failure which leads standard statistical techniques to give both biased and inconsistent results. Third, we use a better measure of international trade flows from the recently available World Trade Database from Statistics Canada which provides symmetric measures of trade flows. With these improvements on the existing work in the literature, we test the putative link between democracy and international trade.

3 Determinants of international trade flows

3.1 Factor endowments, scale economies

In order to test the link between democracy and international trade, we need a flexible model of bilateral trade flows. Conventional international trade theory attempts to explain bilateral trade in terms of relative differences among factor endowments of countries. Consequently, the volume of trade between two countries is usually inversely

proportional to the similarity of endowments. However, due to scale economies, a significant portion of bilateral trade — especially among industrialized countries — also takes place among countries with similar relative factor endowments. Scale economies may lead countries to specialize and trade with one another even in the absence of any difference in relative factor endowments. The monopolistic competition model proposed by Helpman and Krugman (1985) provides a flexible way to represent bilateral trade flows within a general equilibrium framework. In this model, bilateral imports are proportional to the exporting country's industry outputs where the factor of proportionality is the importing country's share of the world expenditure.

The monopolistic competition model is a description of bilateral trade flows under the assumption that there is no trade friction in the flow of goods and services (i.e., it is a model of free trade). The existence of policy, political, and other distortions will enhance or diminish the volume of trade between two countries. Since the main use of the model in this study is to examine the effect of democracy and other political and policy variables on bilateral trade flows, we can incorporate these types of factors directly into the monopolistic competition model. In addition to the regime characteristics of the trading partners (as measured by level of democracy), we consider two other types of distortions: (1) policy distortions such as trade barriers; and (2) political distortions such as interstate conflict, security arrangement, and similarity of interests. Consider each of these in turn.

3.2 Trade barriers

One of the most explicit forms of policy distortion to bilateral flows is trade barriers. Trade barriers range from visible restrictions such as tariffs and quotas to the less visible such as non–tariff barriers via industrial and procurement policies and enforcement. The effect of tariffs on imports has received wide attention in the international trade literature and in international trade policy.[1] The General Agreement on Tariffs and Trade (GATT) has provided the institutional basis for trade negotiations in the post World War II era. Successive rounds of GATT negotiations have led to a substantial decline in tariff barriers and a significant increase in merchandise trade among major industrial and industrializing economies. The last round of negotiations, the Uruguay Round, has led to further reductions in barriers in both developed and developing economies in the late 1990s. Also, as many developing countries undertook economic liberalization programmes in the 1990s, they have significantly reduced trade barriers. Given these reductions, one would expect that tariff barriers play a decreasing role in determining bilateral trade flows. However, the successful reduction in tariff barriers seems to have given rise to non–tariff barriers, especially among developed countries. Since the principal aim of these barriers is to reduce imports to protect domestic producer groups or import competing sectors, we would

[1] Leamer (1992) surveys a number of measures of tariff barriers and their effects on international trade.

expect the link between trade flows and trade barriers to be negative.

3.3 Cooperation and conflict

The political relations between states can also influence their bilateral trade flows in a number of ways. The simplest mechanism is through direct trade policy: when two countries are in direct military conflict with each other, they are likely to cut-off trade or impose economic sanctions. Examples would include U.S. trade policy towards Iraq, Iran, or Cuba. The work of Brian Pollins (1989*b*; 1989*a*) identifies a more microeconomic mechanism between conflict and trade. Pollins argues that importers take into account not only the price and quantity of goods and services in their purchase decisions but also the place of origin of the products and the political relationship between the importing and exporting countries.[2] They do so to minimize disruption to supply. In a market where the suppliers are from both friendly and hostile nations, the risk factor might tilt commerce in favor of the suppliers in the friendly nation by an appreciable amount. Consequently, the level of trade between two countries will decline as their relations become more conflictual. Pollins empirically tests this hypothesis by incorporating a measure of net cooperation between two countries into a simple gross imports equation for six countries. He finds that relative cooperativeness or hostility does affect trade flows between trading partners and concludes that trade does indeed 'follow the flag'.

In a similar vein, Dixon, Muller and Seligson (1993) argue that countries with similar interests have higher levels of trade than those with dissimilar interests due to differences in risk premia to firms engaged in international trade. Dixon, Muller and Seligson (1993) test this hypothesis on U.S. trade and show that trade is higher with countries which have a similar voting pattern in the United Nations (proxy for similarity of interests). Morrow, Siverson and Tabares (1998) also include both these direct and indirect effects of conflict on bilateral trade flows and find that the indirect effects are positive and significant while the direct effect of conflict is not statistically significant.

3.4 Alliances

A different political relationship between trading partners is explored by Gowa and Mansfield (1993). Gowa and Mansfield argue that the existence of a formal alliance between the importing and exporting nations will lead to fewer trade barriers and thus to an increase in trade. Moreover, they argue that this effect is distinct from the normal cooperation and conflict between two nations in that a considerable degree of low–level conflict is often present among members of an alliance and substantial cooperation does exist among states that are not allied. The basis for their argument is that trade produces security externalities in the form of increased efficiency with

[2]For earlier work on this issue, see Polachek (1980) and Gasiorowski and Polachek (1982).

which domestic resources can be employed. The increased efficiency allows a state to make more resources available for military uses (Hirschman 1980; Srinivasan 1987). Thus, trade produces security externalities by enhancing the potential military power of the trading partners.

Gowa and Mansfield argue that, given the anarchic nature of the international system and the lack of a supranational authority, states are forced to consider the potential military power of both allies and adversaries in their security calculations. Given the security externalities of international trade, trading with an ally produces a positive externality as the increase in efficiency with which resources are allocated in both states increase the resources available for their military forces. Similarly, trade with an adversary produces a negative externality. These externalities thus lead to a divergence between the private and social costs to trade. As a result, a socially sub–optimal level of trade could take place and government intervention in trade can be welfare–enhancing. Thus, Gowa and Mansfield argue that tariff barriers should be lower among allies than among adversaries. They empirically test this hypothesis by augmenting a general gravity equation of imports with variables to capture alliance effects. From their analysis of seven countries over an eighty year period from 1905 to 1985, they conclude that "alliances exert a direct, statistically significant, and large effect on bilateral trade flows."[3]

3.5 Similarity of Interests

Signorino and Ritter developed a spatial (in the voting sense, not in the geographic sense) measure of foreign policy similarity. They assume that a state makes choices over a a variety of policy dimensions, and that these choices reveal their foreign policy portfolio. The closer two states are in the policy space, the more *similar* their revealed policy positions. Conversely, states further apart in the policy space have dissimilar revealed policy positions. By calculating the distance between the alliance portfolios of pairs of countries, and weighting it by a distance metric, Signorino and Ritter define a new statistics, $S_{i,j,t}$ that gives a coherent measure of how broadly similar are the foreign policy interests of two countries, as inferred from their portfolios of alliance treaties.

This measure, S, has been proposed as one measure of the strategic political interaction among countries at the international level. As such it has been promoted as an influence on bilateral trade: states with broadly similiar foreign policies are thought to have similar trade preferences. Morrow, Siverson and Tabares (1998) utilize this measure in their model of international trade and show that it has a strong linkage to bilateral commerce.

We turn now to the incorporation of these various elements into a model of bilateral trade.

[3]Gowa and Mansfield (1993, p. 416).

4 Model specification and estimation

Based on the discussion so far, we can express the model in its general form as follows:

$$M_{ij} = M(\underbrace{\overbrace{Q_j}^{HK}}_{=1} , \underbrace{\overbrace{C_{ij}, T_i}^{Constraints}}_{<0} , \underbrace{\overbrace{A_{ij}, S_{ij}, D_{ij}}^{Accelerators}}_{>0})$$

i	:	importing country
j	:	exporting country
M_{ij}	:	weighted bilateral imports
Q_j	:	exporter output (ln -2.89,8.70)
C_{ij}	:	political conflict (0,1=yes)
T_i	:	trade barriers (ln -20.45,0.52)
A_{ij}	:	security alliance (0,1=yes)
S_{ij}	:	similarity of interests (-1.89,0)
D_{ij}	:	democratic similarity (0,1=yes)

An important but generally ignored issue with the estimation of this model is the spatial dependence among the different observations. Trade, by construction, is a process in which flows between two countries are not independent of flows between those countries and other countries. Thus, the standard assumption of independence of observations does not hold, as the bilateral pairs are not strictly speaking, *exchangeable*. Therefore, we need to take into account their spatial correlation along similar lines to serial correlation in a time series framework. In fact, in the presence of spatial dependence, OLS results are both biased and inconsistent. In the next section, we describe the spatial autoregressive model which corrects both these drawbacks.

4.1 Spatial dependence

A mixed regressive spatial autoregressive model (SAR) is described by:

$$y = \rho W^s y + X\beta + \epsilon \quad (1)$$
$$\epsilon = N(0, \sigma^2 I_n) \quad (2)$$

where y is an $n \times 1$ vector of the dependent variable, X is a $n \times k$ matrix of explanatory variables and W^s is a row standardized spatial contiguity matrix. ρ is the coefficient on the spatially lagged dependent variable $W^s y$ and β is the set of coefficients for the explanatory variables in the model.

Incorporating these political and policy variables into the basic gross imports equation from the Helpman–Krugman model, the specific form of the augmented model is then:

$$M_{ij} = \overbrace{\beta + \beta_Q Q_j}^{Helpman-Krugman} + \overbrace{\beta_C C_{ij} + \beta_T T_i}^{Constraints} + \overbrace{\beta_A A_{ij} + \beta_S S_i + \beta_D D_{ij}}^{Accelerators} + \overbrace{\rho W^S M_{ij}}^{Spatial} \quad (3)$$

where each of the variables is expressed in natural logs and the error term is log–normally distributed.

The maximum likelihood estimation for this model is developed by (Anselin 1988), since an OLS estimation of the above equation will produce not only inefficient, but also biased estimates of the parameters. One drawback of this estimation method is the assumption that the underlying disturbance process is normally distributed. Strictly speaking the likelihood for such a model is very complicated, since it is conditioned on known values for all cases in the consideration of each case. Standard approaches involve two strong assumptions. First, it is assumed that the spatial weight is *known* in advance. This distinguishes this approach from the *autologistic* approach (*vide* Besag 1974). Second it is typically assumed that the $ln|I_n - \rho W^s|$ term is factored out of the likelihood *via* the method of Besag and Moran (1975).[4] Anselin (1988) and LeSage (1999) discuss these ideas.

The conjugate combination of advances in Bayesian approaches to data analysis (an excellent introduction to which is Gelman and Rubin 1996) and the development of Markov Chain Monte Carlo simulation techniques for analysis of statistical problems (nicely summarized in Gilks, Richardson and Spiegelhalter 1996) has meant that previously intractable or highly difficult problems such as these can now be handled in a different, more effective manner. This is not the place to review the Bayesian or MCMC approaches, but they provide a more effective way of handling large problems such as those we are dealing with herein, where our contiguity matrix is on the order of $100,000^2$. Indeed, MCMC approaches were developed to explicitly handle such problems and are approximately equal to a spatial model.

Accordingly we will estimate our model using a classical SAR model, as well as a Bayesian version of it that uses MCMC sampling to draw candidate parameter vectors from a diffuse set of conjugate priors in order to build up information about the distributional characteristics of the estimated parameters. Before turning to these results, we briefly describe the data we employ.

4.2 Data

Bilateral trade data are from Statistics Canada World Trade Database. These data are based on import and export data from the UN Statistical Office. These latter

[4]However, computational resources have grown since 1975 and the inversion of relatively large matrices within the optimization search is no longer impossible.

data suffer from a number of problems due to differences in reporting, treatment of transport costs, commodity designations, valuations, and the due to the uncertainty of sources of imports and destination of exports. Statistics Canada corrects for many of these discrepancies and creates a single–valued array that is based on the four–digit UN SITC Revision 2 classification (Feenstra, Lipsey and Bowen 1997). In this study, we use the aggregated trade flows for manufacturing from 1970–1995. Economic and demographic data are from the World Bank *World Development Indicators, 1998*. These include output, aggregate expenditure data for weighting the imports, and a measure of trade barriers (customs revenue as a share of imports). Distance data are capital to capital distances in kilometers.

Turning to political variables, conflict data are from the Militarized Interstate Dispute dataset from Correlates of War Project at the University of Michigan. The original MID measure covers any event involving the threat to use force or the actual use of force on a scale of 1 to 5. We recode this scale as a binary variable indicating the presence or absence of a militarized conflict between two states (the dyad) in a given year. Alliance data are also from the Correlates of War project. The original COW measure codes different levels of military alliance from 1 to 3 which we recode here as a binary variable for the presence or absence of a security alliance. Finally, the democracy measure is from a corrected version of POLITY III data (Jaggers and Gurr 1994), also known as POLITY IV. Following standard practice, we code as democracies countries that have a score of six or higher on the democracy scale in POLITY III; accordingly, democratic similarity requires both countries to be democratic by this measure. The measure of similarity of interests is the S measure developed by Signorino and Ritter (1999). S is a measure of policy portfolio similarity of two countries and is computed from the patterns of alliances from the Alliance Data from the Correlates of War Project.

4.3 Estimation

Table 1 presents the SAR as well as Bayesian SAR estimates of parameters for equation 3 as specified above. This specification differs from that typically found in the literature in that it not only includes a term for trade barriers, but it also includes a spatial lag term. These estimated parameters are quite in line with the argument presented above. First and perhaps foremost, the spatial parameter $\hat{\rho}$ is significant and relatively large.[5]

The theoretical expectation of β_Q is unity and our estimate is close to 1.0. This suggests that the equilibrium trade model is working as expected and broadly captures the bilateral equilibrium trade values for typical country pairs. Having established strong confidence in the underlying model, we now turn to interpreting our political variables.

[5]Because our matrix is approximately $100,000^2$ and row standardized, scale effects mean that 0.01 is actually a pretty large effect when combined.

The estimated coefficient for political conflict is not plausibly different from a prior of 0.0. This result is quite different from what is generally found in the literature, though it is consistent with the findings in Morrow, Siverson and Tabares (1998; 1999). Gleditsch (1999) also found only a weak link between conflict and trade, one which was stronger and more consistent for civil wars than for international wars and militarized interstate disputes. There are several reasons why interstate military conflicts may not influence bilateral trade flows. In data based on annual observations, militarized interstate disputes are coded as a 1 for the entire year no matter when they actually occur during the year. Further, enduring conflicts are quite rare and therefore most conflicts are short lived. On the other hand, trade data is measured at the end of the year. So, unless a militarized interstate dispute occurs in the earlier part of the year, one may not see its economic consequences reflected in the trade data. Furthermore, most trade flows are based on longer term contracts and one would expect that the short term military conflict short of a complete embargo on trade should not effect the risk profiles for traders.

Trade barriers, however, prove to be a strong inhibitor to bilateral trade, as expected. The coefficient is relatively large (these are in log form) and have relatively tiny standard errors, indicating a low level of uncertainty about these effects. This effect has not been widely explored in quantitative studies of the political determinants of international trade flows, but appears to be quite strong, much stronger than the oft-studied conflict–trade linkage.

Turning to the variables that capture the effect of alliance similarities and mutual alliances, we find that both variables are quite strong and in the predicted direction. Countries with mutual alliances, *ceteris paribus*, do appear to have larger volumes of commercial activities with one another. At the same time, countries that have more similar profiles of international preferences also have an independently higher level of bilateral commerce. These findings conform in large part to what has been found in the extant literature.

However, it does not appear to be the case that, given these influences, that high levels of democracy in the trading partners appears to bear any *independent* causal effect on the volume of bilateral trade. The estimate coefficient is roughly equal to its prior (0.0) with a substantial amount of uncertainty around that value. Conditional on the other values in the model, democratic pairs of countries *do not* trade more with one another than mixed or non-democratic pairs of countries. This finding is not consistent with most other empirical studies in the field.

It should be remembered that these findings must be interpreted in light of a model that incorporates the nonexchangeability of observations, which are shown to be important. Spatial dependencies in trade patterns must be taken into account in such models, and when they are we see a fundamental reversal of some important findings in the literature.

Compare this with a more typical specification which does not include trade barriers, nor a spatial specification. In Table 2 we broadly replicate the empirical analysis

Dependent variable: Bilateral imports (M_{ij})			
		Estimated via:	
Variable	**Parameter**	**SAR**	**Bayesian SAR**
Intercept	β	-11.76	-11.73
		(0.02)	(0.02)
Exporter Output	β_Q	1.04	1.05
		(0.004)	(0.004)
Political Conflict	β_C	-0.23	-0.41
		(0.80)	(0.63)
Trade Barriers	β_T	-0.09	-0.07
		(0.01)	(0.01)
Mutual Alliance	β_A	1.11	1.03
		(0.02)	(0.02)
Similarity of Interests	β_S	1.31	1.09
		(0.04)	(0.04)
Democratic Similarity	β_D	0.02	-0.02
		(0.02)	(0.02)
Spatial lag	ρ	0.01	0.01
		(0.002)	0.001
N =94,811			

Table 1: A model of bilateral trade flows.

		Dependent Variable: Bilateral imports (M_{ij})
Variable	**Parameter**	**OLS with Newey-West $\hat{\sigma}$**
Intercept	β	-11.93
		(0.023)
Exporter Output	β_Q	1.04
		(0.005)
Political Conflict	β_C	-0.12
		(0.315)
Mutual Alliance	β_A	1.07
		(0.032)
Similarity of Interests	β_S	1.32
		(0.050)
Democratic Similarity	β_D	0.06
		(0.021)
$N = 94{,}811$		

Table 2: Replication of Morrow et al. (1999) results

found in Morrow, Siverson and Tabares (1999). We use a different database, one that has symmetric bilateral trade, and a different model of trade, one that is an equilibrium model of free trade (as opposed to a gravity model as found therein). In Table 2 we seek to show that if you omit the spatial variable as well as the variable that establishes the strong constraints on trade, tariff barriers, that the standard result that joint democracy increases trade emerges. These estimates basically replicate the results found in the corrected estimates found in Morrow, Siverson and Tabares (1999) in that political conflict (i.e., MID) is not found to be a powerful predictor of bilateral trade, but mutual alliances, similarity of interests, and democratic similarity each are found to be associated with higher levels of bilateral commerce.[6]

This suggests that the finding of trade-promoting democratic cultures may be overstated and dependent on a specification that ignores the spatial heterogeneity of bilateral trade as well as the strong impacts of tariff barriers on bilateral trade. Only when we *mis-specify* the model by omitting these linkages does the democracy–trade link emerge. What does this mean? In part it means that a full accounting of the spatial effects is necessary to understand international trade models that have strong spatial heterogeneity (against the assumption of most statistical models of the homogeneity of variance). It may also mean that trade barriers are simply a mechanism through which countries can affect bilateral aggregate commerce. It may be that democracies have fewer or lower barriers against other democracies, for example.

[6]Another minor difference is that we use the Signorino and Ritter (1999) measure of similarity of interests, while they use $\log \tau$.

5 Conclusion

What conclusion can we draw from these analyses? We have shown that theoretically as well as empirically, bilateral trade flows are not independent, but are interdependent. The implication of this is that statistical models which ignore this interdependence risk generating conclusions that are based on biased and inefficient coefficients. Such coefficients may lead to erroneous conclusions. Since the literature on trade and conflict almost universally ignores this conditionality, that literature may replicate a variety of results that are consistently (though not efficiently) biased. When disequilibrating forces are incorporated into a model of free trade that is estimated in a way consistent with spatial heterogeneity, the links that many studies report between bilateral conflict and trade disappear and the linkages virtually all other studies have uncovered between "joint democracy" and trade evaporate. By eliminating the spatial linkages and the trade barriers from our model, we are able to pretty faithfully replicate the results found in recent, prominent work in this area (Morrow, Siverson and Tabares 1999).

Thus we are led to several, short conclusions:

1. Bilateral trade flows as well as bilateral conflict patterns are *not* spatially homogeneous;

2. Empirical models that ignore this simple fact generate results that *overstate* the general ability of conflict to dampen trade;

3. There is little evidence of a liberal, democratic enhancement to bilateral trade, once trade barriers and spatial heterogeneity are taken into account.

4. Repeated replication of variants of similar models that ignore spatial heterogeneity are likely to continue to produce fairly similar results, but there is a high likelihood that these frequently replicated results actually point in the wrong direction.

It may well be that democracy and peace enhance commerce at the aggregate level. It may even be that zones of peace, democracy, and commerce evolve together. But these gross statements require unpacking to determine what exactly is occuring, for it is clear that they don't apply universally well at all points in time or space. Undertaking this spatial and temporal disaggregation leaves us with more concrete information about the actual mechanisms, if any, in force as well as additional information about the degree of uncertainty that provides a wide fiducial band on our empirical assertions. In and of itself, international commerce is not "caused" by the absence of conflict nor by the presence of shared democratic institutions. As we make our models more precise, our understandings of the constitutive components of bilateral trade may be embellished away from incorrect generalizations that are too coarsely grained to be very informative in the first place.

References

Anselin, Luc. 1988. *Spatial Econometrics: Methods and Models.* Dordrecht, The Netherlands: Kluwer Academic Publishers.

Barbieri, Katherine and Gerald Schneider. 1999. "Globalization and Peace: Assessing New Directions in the Study of Trade and Conflict." *Journal of Peace Research* 36(4):387–404.

Besag, Julian E. 1974. "Spatial Interaction and the Statistical Analysis of Lattice Systems (with Discussion)." *Journal of the Royal Statistical Society, Series B, Methodological* 36:192–225.

Besag, Julian E. and Patrick A. P. Moran. 1975. "On the Estimation and Testing of Spatial Interaction in Gaussian Lattice Processes." *Biometrika* 62:555.

Bliss, Harry and Bruce Russett. 1998. "Democratic Trading Partners: The Liberal Connection, 1962–1989." Working Paper.

Dixon, William J., Edward N. Muller and Mitchell A. Seligson. 1993. "Inequality and Political Violence Revisited." *American Political Science Review* 87(4):983–993.

Feenstra, Robert C., Robert E. Lipsey and Harry P. Bowen. 1997. "World Trade Flows, 1970–1992." NBER Working Paper 5910.

Frieden, Jeffry A. 1991. "Invested Interests: The Politics of National Economic Policies in a World of Global Finance." *International Organization* 45(4):425–451.

Garrett, Geoffrey. 1995. "Internationalization, Institutions, and Political Change." *International Organization* 49(4):627+.

Gasiorowski, Mark and Solomon W. Polachek. 1982. "Conflict and Interdependence: East–West Trade Linkages in the Era of Detente." *Journal of Conflict Resolution* 26:709–729.

Gelman, Andrew and Donald B. Rubin. 1996. "Markov Chain Monte Carlo Methods in Biostatistics." *Statistical Methods in Medical Research* 5:339–355.

Gilks, W. R., S. Richardson and D.J. Spiegelhalter. 1996. *Markov Chain Monte Carlo in Practice.* Boca Raton,LA: Chapman & Hall/CRC.

Gleditsch, Kristian S. 1999. Peace Has Its Victories, No Less Renowned Than War: A Local Interaction Approach to Regional Conflict, Integration, and Democratization PhD thesis University of Colorado Boulder, Colorado: .

Gowa, Joanne and Edward D. Mansfield. 1993. "Power Politics and International Trade." *American Political Science Review* 87(2):408–420.

Helpman, Elhanan and Paul R. Krugman. 1985. *Market Structure and Foreign Trade: Increasing Returns, Imperfect Competition, and the International Economy.* Cambridge, Massachusetts: The MIT Press.

Hirschman, Albert O. 1980. *National Power and the Structure of Foreign Trade.* Berkeley, California: University of California Press.

Jaggers, Keith and Ted Robert Gurr. 1994. "Tracking Democracy's Third Wave with Polity III Data." *Journal of Peace Research* 32:469–482.

Leamer, Edward. 1992. The Structure and Effects of Tariff and Nontariff Barriers in 1983. In *The Political Economy of International Trade*, ed. Ronald Jones and Anne Krueger. Basil Blackwell.

LeSage, James P. 1999. *Spatial Econometrics using MATLAB.* The Web: www.econ.utoledo.edu.

Mansfield, Edward, Helen Milner and B. Peter Rosendorff. 1997. "Free to Trade: Democracies, Autocracies and International Trade." Working Paper.

Mansfield, Edward, Helen Milner and B. Peter Rosendorff. 1998. "Why Democracies Cooperate More: Electoral Control and International Trade Agreements." Working Paper.

Morrow, James D., Randolph M Siverson and Tressa E. Tabares. 1998. "The Political Determinants of International Trade: The Major Powers, 1907–90." *American Political Science Review* 92(3):649–661.

Morrow, James D., Randolph M Siverson and Tressa E. Tabares. 1999. "Correction to: 'The Political Determinants of International Trade'." *American Political Science Review* 93(4):931–933.

Polachek, Solomon W. 1980. "Conflict and Trade." *Journal of Conflict Resolution* 24:55–78.

Pollins, Brian M. 1989*a*. "Conflict, Cooperation, and Commerce: The Effects of International Political Interactions on Bilateral Trade Flows." *American Journal of Political Science* 33:737–761.

Pollins, Brian M. 1989*b*. "Does Trade Still Follow The Flag?" *American Political Science Review* 83(2):465–480.

Rogowski, Ronald. 1989. *Commerce and Coalitions: How Trade Affects Domestic Political Alignments.* Princeton, N.J.: Princeton University Press.

Signorino, Curtis and Jeff Ritter. 1999. "Tau-b or Not Tau-b." *International Studies Quarterly* 43(1):115–144.

Srinivasan, T. N. 1987. The National Defense Argument for Government Intervention in Foreign Trade. In *U.S. Trade Policies in a Changing World Economy*, ed. Robert M. Stern. Cambridge, Massachusetts: Massachusetts Institute of Technology Press.