GLOBALIZATION AND ARMED CONFLICT

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CHAPTER 2

Multilateral Interactions in the Trade-Conflict Model

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Critiques of the Liberal Hypothesis

A number of articles in economics as well as in political science examine how economic variables affect political activities. The trade-conflict model considers the extent to which international trade strengthens political relations among trading partners. Although the potential role of trade in fostering international cooperation emanates from ideas at least as early as Crucé (1623), research especially in the last couple of decades presents a cogent theory along with empirical tests. The logic is simple: If conflict leads to a cessation or at least a diminution of trade through tariffs, quotas, embargoes, or other means, then countries with the greatest gains from trade face the highest costs of conflict. As a result they engage in the least conflict and most cooperation. Thus, trading nations cooperate more and fight less. In a number of empirical analyses, I have used the Cooperation and Peace Data Bank (COPDAB) and the World Events Interaction Survey (WEIS) to support this contention (Polachek, 1978, 1980, 1992; Polachek, et al. 1999). Others use the Correlates of War (COW), Militarized Interstate Dispute (MID), and other data (Kim, 1995; Mansfield, 1994, 1995; Oneal et al., 1996; Oneal and Ray, 1997; Oneal and Russett, 1997; and Wallensteen, 1973). This inverse relation between trade and conflict is often denoted as the 'liberal peace' because liberal philosophers such as Kant and others following him advocated the importance of democratic institutions as a means to enhance trade as a path toward peace. Often the trade-conflict relation-

ship is referred to as the 'interdependence-conflict' relationship or simply the 'liberal hypothesis'. In this chapter I use these terms interchangeably.

Since the late 1980s, the trade-conflict relationship has been subject to much empirical testing, with the most recent work using sophisticated econometric techniques. Whereas most studies find that trade reduces conflict, others suggest the opposite, namely, that trade partners fight more. The editors of this volume summarize the relevant findings (chapter 1).

Taken at face value, the nonuniformity of results suggests something possibly askew with liberal theory, leading some to pose alternative theories. My read of the literature yields three alternatives, each with implications seemingly different from the inverse trade-conflict relationship. One theory is Marxist-based, of late advocated by Barbieri (1996a, 1997). The second, espoused by Smith (1980), Seiglie (1998), and Findlay (2001), stems from implications of Ricardian international trade theory. Finally, the third represents an application of game theory adopted by Morrow (1997, 1999) and Gartzke and Li (2001). I contend that these theories neither contradict the liberal approach nor do they yield implications that differ from the inverse trade-conflict relationship. However, to understand the contradictory results, it is important to show why these three theories fail to rectify the paradoxical empirical results. Instead of coming up with alternative theories, I believe the appropriate strategy is to refine the expected-utility model upon which the liberal theory is based. As such, in this chapter, I go beyond the current conflict-trade model by expanding the theory to incorporate multilateral considerations. Thus I obtain new empirical implications, which can be tested in future research.

The chapter is divided into two parts. The first defends the liberal theory's inverse conflict-trade prediction against the three alternative approaches mentioned above. The second presents a graphical generalization of the bilateral trade-conflict model incorporating multilateral consideration. Implications regarding how trade as well as factors related to trade, such as tariffs, foreign aid, and contiguity, affect third-party interactions are obtained.

Marxist-based Theories of Trade and Conflict

Marxist-based theories contend that colonialism and imperialism go hand in hand with trade, and that countries essentially use military force to expand trade. Trade, viewed in this framework, implies an oppressor nation and an oppressed nation, with the powerful oppressor exploiting the weaker nation. In this case, not only does trade lead to asymmetric trade gains, but trade is involuntary with the gains strictly one-sided. One side wins all, and as such, the other side actually suffers major losses from trade.

Clearly a nation losing resources based on involuntary exploitative trade is far different from a nation engaged in mutually beneficial bilateral trade, where both sides gain. Both types of nations face far different circumstances. One gains from trade, and the other loses. But were trade gains to be negative, even a

liberal theorist would find it reasonable for a nation to fight exploitation. In such a situation neither Marxist nor liberal theories contradict each other. The real questions become whether trade is involuntary, and so exploits a nation thus rendering negative gains from trade, as Marxists claim; or whether trade is mutually beneficial, as certainly most economists now believe. Only if the former exploitation scenario is true can trade lead to conflict, but this circumstance is an empirical question—*not* a counterexample to the liberal hypothesis. Thus there is no contradiction, only the need for researchers to evaluate trade gains.

But, according to some, even in the context of Ricardian neoclassical economic models, positive gains from trade can lead to conflict.

Ricardian-based Theories of Trade and Conflict

Whereas the conflict-trade model uses a Ricardian (1817) framework to show how countries engage in cooperation to protect trade gains, another approach (Smith, 1980; Seiglie, 1998; and Findlay, 2001) adopts the Ricardian gains-from-trade framework to show how conflict can *rise* with trade. In these latter models, rather than trade partners acting cooperatively to protect trade gains, each trading partner utilizes newly acquired gains-from-trade wealth to purchase more of *all* goods and services, including military equipment.

For a state, augmenting its overall domestic well-being makes sense, as does purchasing more military equipment. Indeed, historically nations used their navy to protect themselves from pirates, which probably was the navy's prime raison d'être. On the other hand, it is not clear that augmenting military expenditure to protect trade, or even to augment other aspects of a nation's security, implies more dyadic conflict.

Military expenditure, addressed by these theories, does not necessarily have to be equated with conflict. Although military equipment resulting from military expenditures often is used in combat, it can be employed for other purposes, such as augmenting national security. However, even if used for conflictive purposes, the resulting conflict most likely would *not* be directed toward trading partners, but more likely directed at third parties from whom protecting trade gains is not an issue. As such, gains-from-trade induced military expenditure would not contradict the liberal trade-conflict model that more trade increases cooperation, since any belligerence, if it even occurs, most likely would not be directed toward trading partners. Simply put, military expenditure is an aggregate measure encompassing far more than dyadic conflict. Indeed, bilateral interaction among trading partners should improve to protect the trade gains, which enable spending some of the gains from trade on higher military expenditure to ensure greater security. Thus theories propounding trade to induce higher military expenditures do not contradict the trade-conflict model.[1] As will be illustrated next, the same is true for game theoretic-models.

Game-theoretic Models Relating Trade to Conflict

In the typical game-theory model, parties vie to split contested resources. As already indicated, trade produces gains, which must be divided between two (or more) trading partners. Accordingly, trade gains become the contested resource, and game theory is invoked to determine how each party behaves to determine the division. But, in the process of dividing a given resource, it becomes obvious that what one party gains, the other loses, so that the process itself is conflictive. To game theorists the logic is simple: first, trade creates trade gains; second, trade gains must be divided; finally, dividing trade gains leads to conflict. Following the logic through, trade leads to conflict.

Again there is no contradiction with the liberal trade-conflict model which states that trade yields more cooperation than conflict. Two issues are involved: (1) whether dividing trade gains necessarily yields conflict as game theoretic models imply, and (2) whether the conflict emanating from splitting trade gains outweighs the necessary cooperation needed to protect the trade, which created the gains in the first place.

Take the first issue. The output of a country can be visualized by a production-possibilities frontier representing all goods and services a country can produce under autarky. Comparative advantage occurs when one country's production-possibilities frontier differs from another's. Under such circumstances it pays for each country to trade by exporting what it produces most efficiently and importing what it produces less efficiently. That way neither country need devote resources to inefficient production. Thus if country A has a comparative advantage in agriculture and country B in manufacturing, each can specialize; and both can be made better off. The amount of trade is determined by maximizing both countries' joint welfare, and the terms of trade are set accordingly. Clearly each country gains, but the extent of the gains are determined by relative prices. With only two countries it might pay for each to posture their social welfare in a way to mislead the other in order to eke out a better terms of trade. Such gamesmanship can lead to conflict; nevertheless, it does not pay to have so much conflict so as to deter trade, since such action eliminating trade would eradicate trade gains completely. This is essentially the conclusion reached by Krugman (1995). Thus even if (1) above is correct, dividing trade gains need not imply an amount of conflict that exceeds the amount of cooperation necessary to protect trade in the first place. But it is not obvious that game theory is even always relevant in splitting trade gains.

Trade gains are determined by prices. Clearly the higher the export price, the greater a country's revenues from selling its products; and as a result, the greater the trade gains, all else constant. In a global world, prices are usually set in the market. Market determined prices mean that posturing for the best price is not a viable option for the typical (small) country, because the typical country must simply take prices as given. In this case there are no contested resources. Gains from trade are fixed, since each trading partner cannot change world prices. Indeed the only option is to take one's trade elsewhere, but here too the market

basically sets the price. So game theory is essentially irrelevant, because except for countries with monopolistic power the market determines price.

Essentially there is no real contradiction between the above three approaches and the conflict-trade model itself. As such, because there is no contradiction, these three models cannot serve as an alternative explanation for the nontrivial instances of a positive trade-conflict relationship. For this reason, one needs to better understand the conflict-trade model and its implications, in order to better understand the seemingly contradictory findings relating trade and conflict. Accordingly, the remainder of this chapter reexamines the conflict-trade model. I adopt a graphical, rather than the purely mathematical approach used in past articles. Further, I explore implications regarding multilateral rather than solely bilateral relations.

The Analytics of the Trade-Conflict Model

The Basic Model

A world system encompasses numerous countries. Many of these trade with each other because the virtues of trade make each better off economically. This trade results in a system of interdependent countries, which if based on competitive free-market conditions, maximizes world output. Any country breaking off trade not only decreases its own economic well-being but that of its trading partners as well. Tangentially, as will be illustrated, other nontrade partner nations can also be affected. As such, reneging on a trade relationship could be costly from a private as well as global perspective.

Perhaps, for this reason Hirschman (1980: v, xvi) emphasizes 'the politics of foreign trade' by which he spells out 'the possibility of using trade as a means of political pressure ... in the pursuit of power'. Decreasing trade reduces the gains from trade though these losses can be somewhat mitigated if other trading partners can be found. But even here, finding other trading partners is costly.

The formal model initially focuses on one country behaving in isolation with an internal political process governed by the median voter. Depict either the country's or the country's median voter's social welfare function as

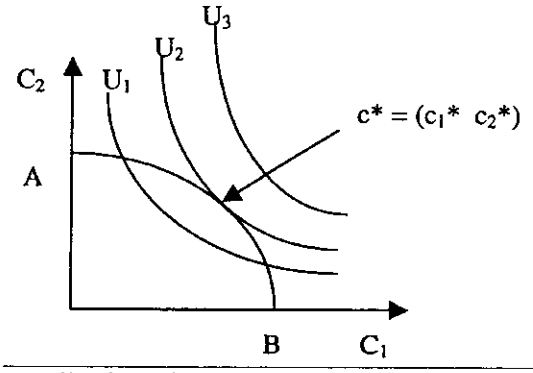
$$W = W(C) \tag{2.1}$$

where C denotes a set of goods consumed by its citizens. The number of consumer goods produced depends on the autarky's resources, and is depicted by a production possibility frontier (Q). Standard theory dictates that the country's leaders maximize a welfare function, subject to the production possibility frontier. This yields an optimal production (Q^*) equal to consumption (C^*).

The country's optimization process can be illustrated graphically for the two-commodity case (figure 2.1). Curve AB depicts the production possibility frontier giving the amounts of goods C_1 and C_2 that can be produced. Curves U_i

are iso-welfare curves. Point C* indicates the optimal production for the country to maximize well-being.

Figure 2.1. An Autarky's Equilibrium Consumption



Allowing other countries implies the actor can boost welfare by engaging in trade. Rather than consuming all its own production, it can sell some production in order to finance imports. Consumption C, is defined as

$$C = Q+M-X$$

where M = imports and X = exports. Exports and imports are chosen by maximizing welfare subject to the countries production-possibility frontier, and a balanced-budget constraint depicting its ability to trade. As such,

(2.2) Max W(C), where

(2.3) $C = Q=M-X$ and $\Sigma P_x X = \Sigma P_m M$,

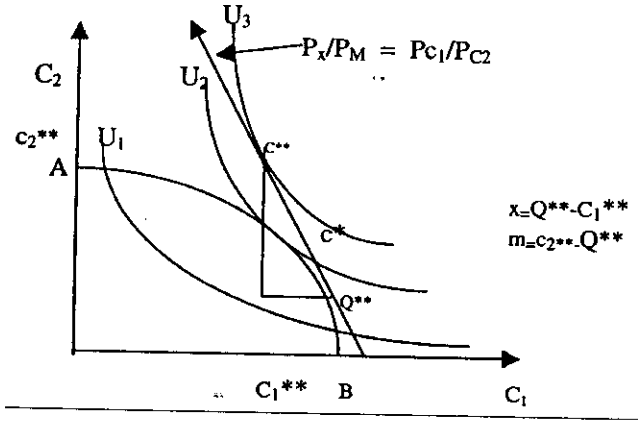
where $P_x \equiv$ export prices and $P_m \equiv$ import prices. This yields a new production Q** that exploits comparative advantage along with optimal imports and exports. Figure 2.2 illustrates the new equilibrium, given terms of trade depicted by line p_x/p_m. As can be seen, trade increases country welfare by U_3-U_2.

Terms of trade p_x/p_m are determined in the international market place, that is, for competitive markets they are simply determined by equating supply and demand curves for each commodity traded. Without much loss of generality, one can summarize all these market interactions by representing the market for all an actor's exports in one supply and demand diagram, which is given in figure 2.3. Similarly one can depict the market for imports in figure 2.4.

Figures 2.3 and 2.4 are not as simplistic as they might first appear. First, note that in each diagram two different sets of countries are represented. It is important to mention that the vertical axes represent relative prices—the price of exports relative to imports in the export market, and the price of imports relative to exports in the import market. In figure 2.3, actor's exports are depicted by the upward sloping supply of exports curve indicating that more exports will be

supplied to the market as the export-relative-to-import price rises. This supply curve is designated by $S_x^A(P)$ where A denotes the exporting 'actor' country and P is the relative price. The demand curve is depicted as $D_x^T(P, Z_i = 0)$ where T signifies the importing target country. (Z_i will be defined later.) The downward- sloping demand curve depicts target countries' demands for the actor's exports. In contrast, the demand in the import market (figure 2.4) reflects the actor country's demand while the supply curve reflects target countries' supply. The equilibria in each figure are depicted by points (P^*, X^*) and (P'', M^*), respectively, meaning that in the export market X* units are traded at relative price P_x/P_m, and in the import market M* units are traded at relative price Pm/Px.

Figure 2.2. The Equilibrium Allowing for Trade



Now suppose that the actor country can interact with target countries *not* only through economic trade *but* also via political behavior. Assume political interactions can be either cooperative or conflictive. Indeed such political behavior can be represented by a number of possible indices denoting the overall degree of cooperation or conflict. Such indices are consistent with the type behavior exhibited in events data such as the Cooperation and Peace Data Bank, (COBDAB) the World Events Interaction Survey (WEIS), or the Kansas Events Data Study (KEDS), which include measures of cooperation and conflict. They are also consistent with the Militarized Interstate Dispute data, (MIDs) and the other Correlates of War (COW) data that only get at the degree of conflict. Also assume such political behavior affects a country's social welfare and has external effects on other countries. To simplify, for now, I concentrate on conflictive behavior, but note that cooperative behavior is really the opposite of conflict—each simply being reverse ends of the political spectrum.

Figure 2.3. The Export Market from Actor i's Vantage

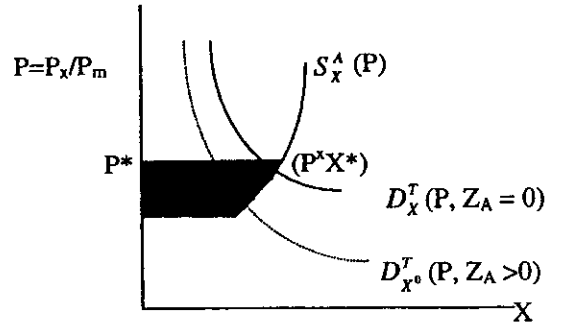
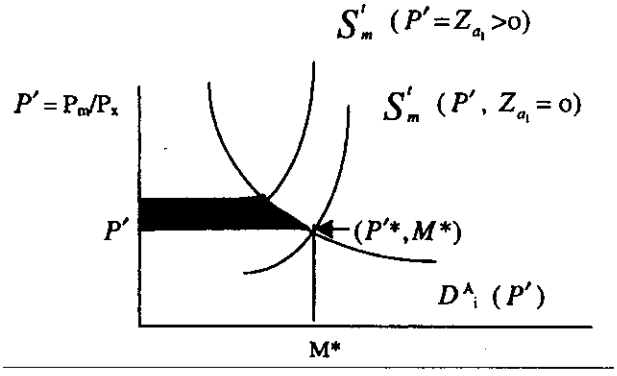


Figure 2.4. The Import Market from Actor i's Vantage



Not unreasonably, assume an actor's conflict instigates a target to respond by shifting its demand and supply curves. Consider two cases: one the target country's reaction to the exporting actor's conflict, and second the target country's response to the importing actor's conflict. In the export market, the target facing an exporter's conflict cuts its demand for the actor's exports. In the import market the target cuts its supply to the actor. Both outcomes can be illustrated graphically in figures 2.3 and 2.4, respectively. In figure 2.3, the target's response to actor conflict is to cut demand for exports. This implies a demand-curve shift for the actor's products resulting in lower actor exports and lower export prices. The new demand is $D_{x^0}^T(P, Z_A > 0)$, where $Z_{A_i} > 0$ denotes actor i conflict vented toward target j. Of course, the magnitude of the effect depends on the extent of the shift, which depends on a number of factors including actor and target country size, as well as other economic factors to be addressed later.

This export-price change is illustrated by the new export equilibrium found by equating demand and supply in figure 2.3.

Similarly, in the import market, it makes sense for a target country to respond to belligerence by cutting its exports to an aggressive actor. Decreasing exports shifts inward the import-supply curve an actor faces, and results in lower import quantities and higher import prices. This scenario is illustrated in figure 2.4. Import-supply curve $S'_m(P', Z_{A_1} = 0)$ shifts to $S'_m(P', Z_{A_1} > 0)$ as targets reduce the supply of exports to the offending actor, yielding a new equilibrium (P'', M^*).

In short, conflict lowers the price a perpetrator receives for exports and raises the price a perpetrator must pay for imports. Thus

(2.4) $P_x = P_x(Z)$ s.t. $P'_x(Z_i) < 0$ and

(2.5) $P_m = P_m(Z)$ s.t. $P'_m(Z_i) > 0$,

where Z represents conflict and i denotes the target country.

Clearly conflict is more costly the greater the rise in import prices and the greater the decline in export prices. But, as can be seen in figures 2.3 and 2.4, the cost of conflict to actor country i is the shaded area depicting the welfare losses from conflict. These welfare losses are the producer or consumer surplus attributable to conflict depicted by the shaded areas under the demand and supply curves. The larger these shaded areas, the higher the costs of conflict, so factors determining the changes in consumer and producer surplus are crucial to understanding conflict. Unmistakably these factors consist of the elasticity of import demand and the elasticity of export supply, and any related economic variables shaping these bilateral elasticities. Given the paucity of bilateral elasticity measures especially for particular products, this chapter concentrates on the impact of antecedent factors affecting these elasticities.

One can obtain the above conclusion regarding the role of import demand and supply elasticities via more formal analysis. But first take a simple case. Maximizing welfare function (2.1) subject to equations (2.2) to (2.5) shows that the budget constraint incorporating the impact of conflict on import and export prices will result in conflict being inversely related to trade. This is illustrated as follows:

Max $W_i(C)$ subject to: $C = Q + M - X$ and $X\,P_x(Z) - M\,P_m(Z) = 0$ implies maximizing the Lagrangian multiplier equation

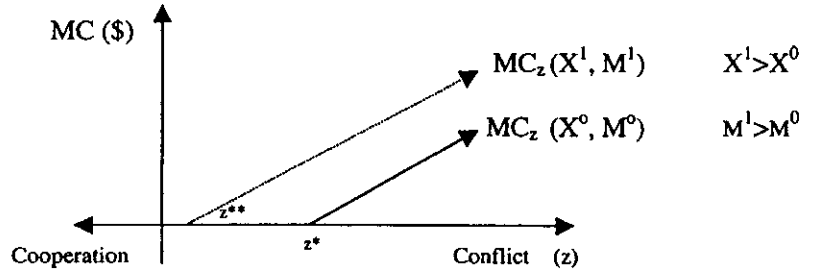
(2.6) $L = W(Q + M - X) + \lambda\,(X\,P_x(Z) - M\,P_m(Z))$.

The resulting equilibrium condition is:

$$(2.7)\quad X\frac{dPx}{dz} + M\frac{dPm}{dz} = 0$$

which has an interesting interpretation regarding the optimal amount of conflict. The term, $X\frac{dPx}{dz}$ represents the level of exports multiplied by the lower price an actor receives when engaging in an extra unit of conflict. As such, it depicts the lower revenues a country obtains by engaging in conflict. The term $M\frac{dPm}{dz}$, represents the amount of imports multiplied by the higher import price an actor must pay when engaging in an extra unit of conflict. It depicts the extra cost a country faces when increasing conflict. The sum of the two is the marginal cost of each extra unit of conflict. If this curve is upward-sloping (like most marginal cost curves), then optimal conflict occurs when this curve intersects the horizontal axis. Simply put, a country cuts back on conflict until the point where conflict no longer pays. 'One turns one's cheek', at least until the point it gets slapped. This optimality condition is illustrated in figure 2.5 by point Z*.

Figure 2.5. Optimal Actor Conflict



It is easy to show that the marginal cost of conflict shifts upward as a country engages in more foreign trade. Clearly, $\partial MC(Z,X,M)/\partial X>0$ and $\partial MC(Z,X,M)/\partial M>0$ so that a larger X or M implies greater marginal costs of conflict and hence less conflict. This is depicted by the dotted marginal cost curve in figure 2.5. Equilibrium conflict is lower, Z** instead of Z*.

The above result is based purely on economics. Countries minimize the costs of conflict by cutting any conflict to the point at which they will not be taken advantage; they are nice, but not too nice. However, not everyone would agree that conflict is completely an economic decision. Realist theory, which emphasizes the importance of national security, might motivate one to incorporate conflict directly into a country's social welfare function, especially if policymakers perceive directed conflict to actually protect a nation. Further, although one would hope a country's voters have no desire for conflict, there remains the possibility that leaders act belligerently to appear strong internationally. Such leadership may stimulate a nation to rally around the flag as a means of deflecting important issues, but alternatively it could cause a nation to acquire more territory and impose political, religious, or ethnic agendas worldwide. To account

for such innate conflictive desires entails adding Z directly to the actor's social-welfare function (or in our case, the median voter's social-welfare function). Modifying W(C) to incorporate conflict entails adding conflict to the social welfare function so that the median voter gets added utility directly from conflict. This is achieved by rewriting (2.1) as follows:

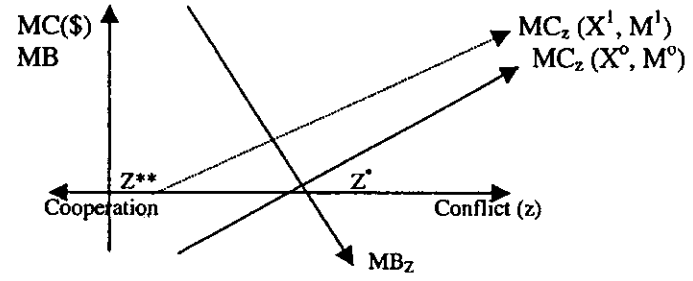
(2.1′) W(C,Z) where $\partial W/\partial Z>0$

Maximizing (2.1′) introduces an extra term in (2.7) so that now

(2.7′) $\partial W/\partial Z + \lambda (X\, dP_x/dZ + M dP_m/dZ) = 0$

where $\partial W/\partial Z$ is the marginal social benefit of an extra unit of conflict. In equilibrium a country now equates the marginal benefit of conflict with conflict's marginal cost. Given a typically downward sloping marginal benefit curve (figure 2.6), this implies an equilibrium Z* at the intersection of curves $MC_Z(X^0,M^0)$ and MB_Z when trade is (X_O,M_O); or Z** at the intersection of $MC_Z(X^1,M^1)$ when trade is (X_1,M_1).

Figure 2.6. Optimal Actor Conflict Incorporating Noneconomic Motives for Conflict



Extending the Basic Model

Multilateral International Interactions

One limiting feature is the failure of equation (2.1′) to distinguish specific target countries. Specifying conflict without regard to a specific target, results in conclusions based on bilateral interactions, but does not yield insights regarding multilateral relations. Yet multilateral relations are important both politically and economically. How alliances form and how third parties intervene in ongoing conflicts form a large political science literature (e.g., Altfield and Bueno de Mesquita, 1979; Holsti et al., 1973; Kim 1991; Sabrosky, 1980; Singer and

Small, 1966a, b; Siverson and King, 1979, 1980). In this vein, Altfield (1984), Morrow (1991), and Simon and Gartzke (1996) among others base alliances on security gains from joining a coalition. Altfield and Bueno de Mesquita (1979) use an expected-utility model to predict that intervention depends on the utility gained from one or the other party winning. As such intervention is more likely if a third party gains considerable utility from country i winning, instead of country j.

Many alliances contain both large and small countries. Small countries might have an incentive to join such an alliance due to the security a large country offers. On the other hand, rather than substantial security, a large country possibly gains an export market from allying with a small country. Larger export markets yield gains from trade and as a result increased wealth.

Economic trade also increases multilateral relations more directly. For example, Feng (1994) finds that the United States' trade with allies depends on its relations with adversaries. Thus extending the conflict-trade model to consider multilateral interactions is important.

To incorporate multilateral considerations, one must distinguish the specific target countries with which an actor interacts. Denote these targets as i=1, ..., n. In this framework, the social welfare function (2.1′) is further modified so that now the actor country's social welfare function is

$$(2.1'')\ W_A = W(C, Z_1, Z_2, \ldots, Z_n; W_1, W_2, \ldots, W_n)$$

where i=1,...n denotes each of the world's n countries actor A faces. The variable Z_i reflects conflict with each country i. The variable W_i depicts each other country's welfare level. As before, $\partial W_A/\partial Z_i>0$ depicts the welfare gain from conflict with country i. But now, $\partial W_A/\partial W_i$ designates how country i's welfare affects the actor. If the country is a friend, then $\partial W_A/\partial W_i>0$, but $\partial W_A/\partial W_i<0$ if the country is an enemy. Simply put, friends revel in each other's welfare being high. On the other hand, an actor's welfare is smaller the higher the welfare of a foe. In principle, one can define the welfare relationship more generally: $\partial W_i/\partial W_j>0$ imples i and j are friends and $\partial W_i/\partial W_j<0$ implies i and j are enemies.

Whereas an actor's conflict toward country i can increase actor welfare $\partial W_A/\partial Z_i \geq 0$, it most certainly decreases the target's welfare since no country likes to be the recipient of conflict. Thus, $\partial W_i/\partial Z_i<0$. Making use of these inequalities, it makes sense that friendship with a target mitigates conflict whereas rivalry increases conflict. To show this result, recall that the marginal benefit of conflict is $\partial W_A/\partial Z_i$; but this term is equal to $(\partial W_A/\partial W_i \cdot \partial W_i/\partial Z_i)$. This term is negative if actor A and target i are friends (because $\partial W_A/\partial W_i>0$ and $\partial W_i/\partial Z_i<0$ so the product is negative). Thus as illustrated in figure 2.7 the marginal benefit curve shifts down implying less conflict between friends. Conversely, the curve shifts up when i is a rival (because $\partial W_A/\partial W_i<0$ and $\partial W_i/\partial Z_i<0$ so the product is positive) leading to more conflict (figure 2.8). Thus friendships and rivalries affect dyadic relations.

Multilateral Considerations and Trade

But friendships and rivalries also affect multilateral interactions. Consider three countries: (1) an actor A, (2) a target i, and (3) a country j that can either be a friend or foe of i. Ask how an actor's conflict with country i changes when its trade with country j rises. As will be shown, an actor's conflict with country i declines if country j is a friend of i; and an actor's conflict with country i increases if countries i and j are rivaling foes. Thus trade with a friend-of-a-friend decreases conflict, while trade with a foe-of-a-friend increases conflict.

Figure 2.7. Interaction with a Friend

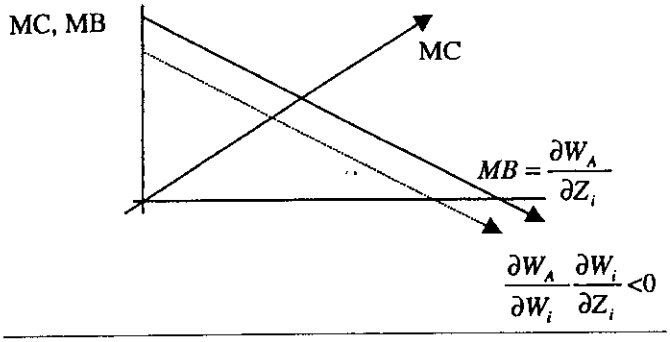
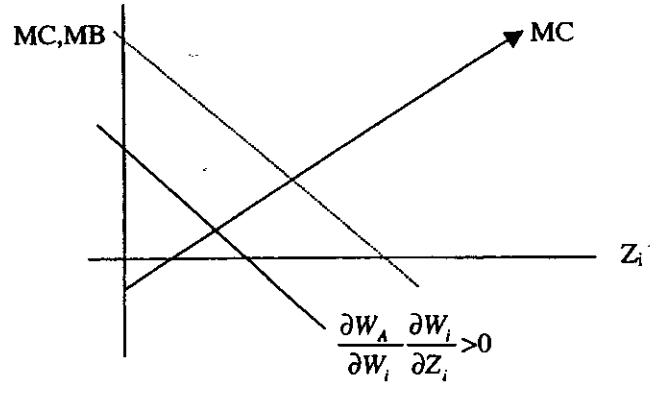


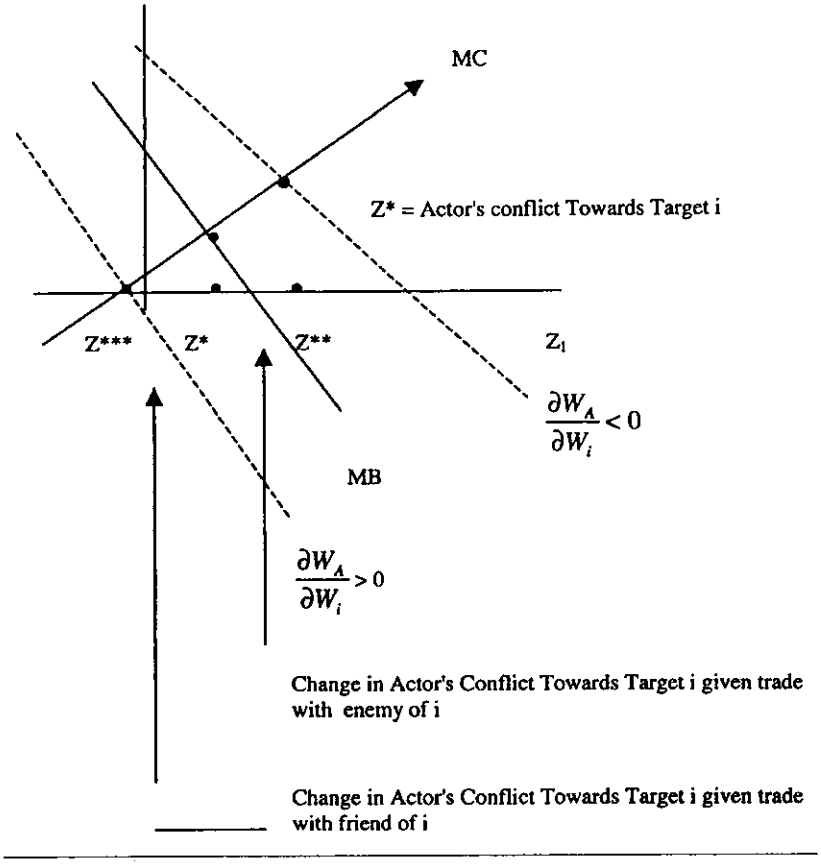
Figure 2.8. Interaction with a Rival



To see this, recall that trade gains imply that bilateral trade increases cooperation and decreases conflict. Thus an actor's conflict with j would decrease were its trade with j to increase. As such, $\partial Z_j / \partial x_j < 0$. Decreased conflict with j raises country j's welfare because $\partial W_j / \partial Z_j < 0$. But increased country j's wel-

fare raises country i's welfare, when countries i and j are friends. Finally, an increase in country i's welfare raises the actor's welfare, thereby implying that conflict with country i decreases. As such, trade with a friend-of-a-friend decreases conflict. This is illustrated in figure 2.9 by the downward shift in conflict's marginal benefit curve, thereby decreasing conflict from Z* to Z***. The scenario for a foe-of-a-friend is the opposite.

Figure 2.9. Conflict Given Multinational Considerations



Trade with an enemy-of-a-friend raises conflict. To see this, follow the same logic as above. An actor's conflict with j decreases as its trade with j increases. Thus $\partial Z_j / \partial x_j < 0$. Decreased conflict with j raises country j's welfare because $\partial W_j / \partial Z_j < 0$. But increased country j's welfare decreases country i's welfare, when countries i and j are enemies. Because of this decreased welfare the actor country increases conflict with i. This phenomena is illustrated in figure 2.9. For

a friend-of-a-foe the marginal benefit curve shifts up, thereby yielding Z** conflict, and thus implying that conflict with country i increases. One can apply the above notions about how trading with a third party affects bilateral political interactions to other situations.

An Application to Tariffs

Consider the impact of tariffs. Tariffs are an import duty country i imposes on an actor's exports. As such, gross export prices increase, although the price the actor actually gets decreases since extra revenues accrue to the importing nation. As a result, trade decreases because of the higher prices paid by importers. Based on the previous gains from trade analysis, decreased trade means increased conflict. This is easily seen in figure 2.5 or figure 2.6 by higher conflict Z** among trading partners compared to nontrading partner's conflict Z*. But it is possible that tariffs can also affect third party conflict.

Whereas most literature deals with multilateral sanctions in the sense that several countries impose a tariff (Mansfield, 1995; Martin, 1992; Mastanduno, 1992), the analysis used here assesses how a tariff affects conflict even on countries that don't impose a tariff. As shown above, trade between an actor and target can alter conflict between the actor and third parties. Since tariffs alter actor-target trade, they may also influence an actor's conflict with third parties. According to the theory illustrated in figure 2.9, actor-target conflict depends on the relationship between the target and the third party. Recall that trade with a foe-of-a-friend increases conflict while trade with a friend-of-a-friend diminishes conflict. As such, a third-party imposed tariff can decrease conflict if the target and third party are enemies, whereas conflict can increase if the target and third party are friends.

An Application to Foreign Aid

How foreign aid influences political relations is a topic often considered by political scientists (e.g., Abegunrin, 1990; Holsti, 1882; Orr, 1889/1990; Richardson, 1978). Most view foreign aid in a bilateral setting, a framework in which foreign aid is simply considered a transfer payment from one country to another but often with requirements to purchase imports from the aid provider. To the extent that foreign aid simply becomes a subsidy to purchase a beneficiary's products, one can analyze foreign aid through its impact augmenting trade. Again, applying the analysis behind figures 2.5 and 2.6, increased trade implies decreased conflict (movement from Z* to Z**). But just like with tariffs, it is possible that foreign aid can alter third party political interactions.

Again refer to the theory behind figure 2.9. Actor-target conflict depends on the relationship between the target and the third party. Trade with a foe-of-a-friend increases conflict while trade with a friend-of-a-friend diminishes conflict. As such, third party foreign aid can increase conflict if the target and third

party are enemies, whereas conflict can decrease if the target and third party are friends. The extent depends on the gains from trade and degree of friendship.

An Application to Contiguity

Many find that contiguity increases war proneness (Barbieri, 1996a; Bremer, 1992; Diehl, 1985; Gleditsch, 1995; Gochman, 1991; Goertz and Diehl, 1992). Indeed, one would be hard pressed to find noncontiguous countries that engaged in militarized dispute prior to the 18th century. The relationship is so well established that some current research addresses *why* neighbors fight, rather than *whether* they fight (i.e., Vazquez (1995). On the other hand, it is well known that neighboring nations take advantage of small transportation costs to engage in more bilateral trade (Anderson, 1979; Arad and Hirsch, 1981; Deardorff, 1984; Gowa, 1994; Tinbergen, 1962). According to the trade-conflict model, greater trade induces less conflict, thus appearing to contradict the empirical findings regarding contiguity and war. However, rather than contradicting each other, the two models may be complementary.

Analyzing the effects of contiguity is difficult because ignoring the effects of trade can lead to an omitted variable bias. One must isolate each effect, otherwise one runs the risk of underestimating conflict between neighboring countries. Despite appearing high to begin with, current conflict measures might underestimate true conflict among neighboring states because they ignore the mitigating effects of trade. Thus while neighbors fight, they might engage in even more conflict were it not for the greater trade levels induced by their proximity to each other. But greater trade between neighboring countries can affect relations with more distant countries, as well.

Again refer back to the analysis regarding third parties. Trade with a friend-of-a-friend fosters less conflict than otherwise, while trade with a foe-of-a-friend brings greater conflict. As such, given the greater trade exhibited between neighbors, an actor should display less conflict toward friends of neighboring countries and more conflict toward a neighbor's rivals.

Conclusion

A number of recent articles have presented theory and evidence that apparently contradict the liberal conflict-trade hypothesis. Each article appears to fall in one of three genres: Marxist-based theory, Ricardian-based theory, and finally game theory. This chapter shows that neither genre contradicts the liberal conflict-trade model. Ricardian-based trade models emphasize how countries utilize trade gains to enhance internal security, but have no propositions regarding protecting trade gains through international cooperation. As such, these models address defense expenditures as a means toward achieving internal security, but they do not take up conflict and cooperation. Game-theoretic models deal with dividing the gains-from-trade bounty, but these models become inappropriate when competitive markets divide gains-from-trade through the international

price system. Even in noncompetitive international markets governed by negotiated prices, countries still have the incentive to protect trade gains through cooperation. Finally the Marxist model assumes strongly asymmetric trade gains, so much so that one exploited nation receives *negative* gains. But the magnitude of trade gains, whether they are negative or positive, is an empirical question. Either econometric estimation to measure trade gains is required, or the Marxist theory must be expanded to get at other corroborative implications. It is in this vein, namely, to expand the conflict-trade model to get at corroborative evidence that motivates this article.

Instead of merely examining the simple conflict-trade relationship, this chapter gets at the model's underlying foundation by moving from a purely mathematical formulation used in Polachek et al. (1999) to a graphical approach with propositions regarding how high gains-from-trade retard political conflict and enhance cooperation. In addition, this chapter extends the model by considering how such factors as tariffs, foreign aid, and contiguity affect international interactions. Finally, this chapter considers multilateral interactions. The approach yields several implications. First, trade with friends yields lower levels of conflict than trade with rivals. Second, when a nation trades with a third party friend-of-a-friend, lower bilateral conflict tends to result with the nation's friend than before. Third, when a nation trades with a third party enemy-of-a-friend, higher bilateral conflict tends to result with the nation's friend than before.

Whereas these propositions have empirical implications, they are difficult to test because measures of friendship rely on assumptions about how one country's welfare affects another, which are unavailable. However, this problem can be overcome. First, data on *relative* levels of conflict contain information on friendship. If, holding constant trade, France is less conflictive with England than the United States; one can infer that England and France are friendlier than the United States and France. Second, alliance data and United Nations voting data specify other ways to define friendship. Hopefully by extending these notions, future work will test some of the model's propositions.

Notes

This chapter is motivated by findings contradictory to the conflict-trade hypothesis presented in *Journal of Peace Research*, 1999, 36(4). It attempts to put those results in perspective as well as present results from Polachek et al. (1999) in a graphical format. The author wishes to thank Katherine Barbieri, Yuan-Ching Chang, John Robst, and J. David Singer for discussion and important insights, as well as Gerald Schneider and two anonymous referees for their comments.

1. Schneider and Schulze (2002b) present empirical results consistent with these notions. The negative military expenditure trade interaction term coefficient presented in their table 5.2 supports this hypothesis since it implies that military expenditures for trading countries are associated with less actual conflict (war initiation).