Economic Interdependence and Peace: A Game-Theoretic Analysis

Brett V. Benson and Emerson M. S. Niou

Most of the contemporary policy debate regarding economic interdependence and peace has focused on devising responses either in favor of or in opposition to the prevailing notion that trade is positively and unconditionally correlated with peace. The China and Taiwan case—noteworthy for the simultaneous presence of an ever-increasing economic interdependence and an adversarial political relationship—provides an interesting counterexample to the leading positions in the literature. What is missing in the literature is a model that studies states' decisions to trade and initiate conflict as a function not only of their own utility but also of their perceptions about how their opponent will respond. States' decisions to trade depend on the likelihood that their prospective trade partner will initiate a conflict, and decisions to initiate a conflict depend on perceptions of the likelihood that the target will concede. In this article, the authors develop a model that expands the domain of the trade-peace analysis by endogenizing and analyzing states' decisions to trade and initiate conflicts.

Keywords: economic interdependence, dependence theory, trade and peace, economic sanction, issue linkage, cross-strait relations, Taiwan Strait, Chinese economy, Taiwan independence, game theory

or the past two decades, trade between China and Taiwan has increased at an impressive rate. For example, from 1999 to 2005 trade between China and Taiwan grew steadily from approximately US\$25.7 billion to nearly \$76.4 billion a year.¹ Although direct trade with China is still prohibited by the Taiwan government, and crossstrait trade is channeled through indirect routes like Hong Kong, Macao, and other areas, China is now Taiwan's largest trading partner. In addition to raw trade volume, mainland China is Taiwan's largest and fastest growing target for foreign investment, with the accumulated contracted amount of investment surpassing US\$45 billion in 2005.²

What can we learn about China and Taiwan from their economic relationship? At a glance, the booming economic relationship between China and Taiwan appears to exhibit expected trends for trade partners that are in close geographical proximity to one another, have complementary comparative advantages, and share a common language and sociocultural roots. However, it is common knowledge that China and Taiwan are also political adversaries because of the decades-long dispute over the question of which government legitimately represents all of China and, in recent years, the official status of Taiwan's sovereignty. How, then, should we expect increasing economic integration to affect the political relationships and prospects for peace and stability between interdependent dyads like China and Taiwan?

Although some disagree, the prevailing view is that economic interdependence promotes interstate peace.³ Early on, the pacific effect of interdependence was justified by two different but related arguments. The first contends that peace follows economic integration through the establishment of social links.⁴ Trade increases communication, a convergence of economic interests, and the establishment of cultural ties that promote relationships of trust and respect between trading partners that will prevent them from resorting to forceful means to resolve disputes.

The second line of argument, which has become the central theoretical rationalization for the liberal proposition that trade promotes peace, is that interdependence results from trade partners' mutual emphasis on maximization of gains from trade, which will be lost if conflict interrupts the trade relationship. From this standpoint, conflict is viewed as a kind of tariff on trade prices, driving import prices up and export prices down.⁵ As the level of trade increases, the cost of conflict also goes up because of the opportunity costs due to lost gains from trade that follow from the onset of conflict. Optimizing trade partners, therefore, will be less willing to initiate a conflict or increase existing levels of conflict, because as trade increases, the marginal cost of conflict also increases, resulting in a decrease in the marginal benefit of more hostility. Less-interdependent countries will derive greater utility from conflict because their opportunity costs are lower due to lower import and export levels. However, as countries trade more and become more interdependent, there is more at stake in terms of welfare gains lost when conflict increases the cost of trade and ultimately threatens the cessation of trade altogether.

What implications, if any, do these arguments have on the political relationships between adversarial trading dyads such as China and Taiwan? Do social links from cross-strait economic integration make conflict between China and Taiwan less likely? If so, then we should observe a shift in perceptions and preferences during the time of social contact. Both sides should increasingly perceive the other as less of a foe and more of a friend, and preferences should change in a way that both sides should become less intransigent on the contentious political issues that might lead either side to take provocative actions that could lead to the escalation of conflict. Some have optimistically suggested that increases in cross-strait commerce and contacts will help bring about the democratization and liberalization of China, which might make China less likely to see force as a viable option against a fellow democracy and may make moving toward unification more acceptable to people in Taiwan.⁶ We might also expect that, according to the liberal argument, interaction with mainlanders will cause Taiwanese individuals to be less interested in pursuing independence, which is known to be one move that China's government would definitely consider to be provocative.

Will social contacts actually harmonize interests across the Taiwan Strait and discourage each other from taking provocative actions that could lead to the escalation of conflict? Though this is hard to predict, it is clear that cross-strait exchanges have steadily increased since 1987, when Taiwan's government began to allow such exchanges, and, based upon what we know from public opinion in Taiwan, where voters' perceptions and preferences presumably affect political behavior, there is a lack of solid evidence connecting increased cross-strait social contacts with a softening of positions on the sovereignty issue that bitterly divides mainland China and Taiwan. People in Taiwan prefer unification with the mainland if China democratizes and liberalizes its economy. This conditional preference has remained consistent since the early 1990s and thus appears to be unaffected by the increase of social contacts over the same period of time. However, increasingly fewer residents of Taiwan see unification as a feasible option. Indeed, the widespread perception in Taiwan is and continues to be that China's government poses a real military threat and is unlikely to democratize. Significantly, as cross-strait social contacts increase, the number of Taiwanese people expressing interest in becoming independent from the mainland also continues to increase.7

What about the opportunity cost argument? Is China becoming increasingly less likely to attack Taiwan as the benefits from economic integration increase? And, is Taiwan less likely to provoke China because war is becoming more costly as cross-strait trade and investment grow? Again, it is difficult to determine whether either side's resolve to fight has diminished over the past two decades of economic integration, but based on signals sent from both sides during this time, there is reason to be skeptical. The first major indicator of the fragility of the security situation was the 1995-1996 Taiwan Strait missile crisis, which threatened Taiwan's security and caused the world to hold its breath. An independent task report at that time sponsored by the Council on Foreign Relations warned that tensions between China and Taiwan threatened the stability of the entire Asia-Pacific region and constituted one of the highest national security concerns of the United States.⁸ Since 1996, both sides have taken actions signaling their resolve on the issue of Taiwan's sovereignty. In 2000, Taiwan elected Chen Shui-bian, the Democratic Progressive Party (DPP) candidate, as president. The DPP, which refuses to acknowledge China's "one China" principle, continues to occupy the presidency and also managed to become the largest party in the legislature in 2002. In 2005, President Chen declared that China and Taiwan are already two separate and sovereign countries, thus implying that while negotiations about unification are possible, the starting point for bargaining is de facto Taiwan independence, and popular Taiwanese consent is necessary for any unification arrangement. In early 2006, Chen dissolved Taiwan's National Unification Council, which was originally officially established for the purpose of negotiating unification with China.

For its part, China's government refuses to renounce the use of force as an option to prevent Taiwan independence and even to reunite Taiwan with the mainland. Over the past decade Beijing's military budget has grown, and a significant percentage of that buildup is directed at the short-range surface-to-surface missile force in China's Fujian province, which is situated across the strait from Taiwan.⁹ In addition to its missile deployments targeting Taiwan, many of China's large-scale military exercises and other improving military capabilities are being developed with Taiwan clearly in mind. In February 2000, Beijing released a white paper on the Taiwan issue that reiterates China's "one China" position and also threatens to use force if Taiwan resists negotiations for unification indefinitely.¹⁰ China's government reinforced the position taken in the white paper on March 14, 2005, when the tenth National People's Congress passed the Anti-Secession Law, which, according to PRC officials, spells out conditions under which China would be legally justified to use force both to prevent Taiwan's independence and to compel unification.¹¹ If cross-strait trade should promote peace, then why does the prospect for peace seem as unlikely, if not more unlikely, to occur today in the midst of booming cross-strait commerce than it did twenty years ago when trade between China and Taiwan comprised less than 1 percent of today's trade flows?

A set of contrary positions claims that the economic relationship between China and Taiwan places Taiwan in a politically vulnerable position with respect to China and may even threaten Taiwan's national security. Dependence scholarship has long cautioned that asymmetries in economically integrated dyads are likely to create incentives for the less dependent actors to exploit its bargaining leverage to manipulate the more dependent actor.¹² Proponents of the economic dependence position point to cross-strait trade and investment asymmetries to support their concern that Taiwan is becoming too economically dependent on China in a way that will give China crucial leverage on politically important issues.¹³ Taiwan's Ministry of Economic Affairs estimates that Taiwan's total trade with China has been rapidly growing as a percentage of its total trade for the past decade (from around 6 percent in 1991 to about 21 percent in 2005), but China's total trade with Taiwan steadily represents only about 6-8 percent of its total trade. Heavy crossstrait trade and the increasing amount of trade and investment directed to China as a percentage of Taiwan's total trade and investment causes many to worry about negative political externalities from becoming too dependent on mainland China for Taiwan's economic well-being.

Taking the effects of economic dependence a step further, neorealist theory implies that the relative gains accrued as a result of the asymmetrical trade and investment relationship between China and Taiwan creates a security threat, because the advantaged side will have an incentive to use its superior bargaining position in a destabilizing way. As a result, we should expect the less advantaged side to shut down the trade relationship to preserve its own security.

Indeed, during former Kuomintang (KMT) president Lee Teng-hui's administration, Taiwan restricted trade with China to try to prevent becoming too economically dependent and politically vulnerable. In 1996, President Lee introduced the "patience over haste" (jie-ji-yong-ren) investment policy. The policy prohibits some forms of mainland investment altogether, bans major infrastructure projects, limits Taiwanese investment in the mainland to 20–30 percent of total investments, and requires that Taiwan businesses not make single project investments in excess of \$50 million. Taiwan imposed restrictions on imports from mainland China, which contributes to Taiwan's substantial trade surplus, and it forbids direct shipping and communication links with the mainland, so Taiwanese investors and traders must operate through third-party outlets. Also under President Lee's administration, Taiwan initiated the "go south" strategy to stall the mass exodus of Taiwan businesses to the mainland by offering incentives for Taiwan businesses to invest in Southeast Asia instead. During the presidency of Chen Shui-bian, who as the DPP leader might be expected to be more sensitive to China's security and less willing to allow trade to compromise Taiwan's political resolve than a KMT president, trade restrictions have remained approximately the same even though flows of trade and investment continue to increase.

How do we explain this puzzle? If political exploitation or a potential security asymmetry is likely to be obtained, why does crossstrait trade and investment continue to increase? The simultaneous presence of a strong trade relationship and a perilous political rivalry between the same two political entities evokes some interesting general questions about the relationship between economic interdependence and peace.

Endogenous Relationship Between Economics and Politics

Empirical research on the effects of economic interdependence disputes the effects of economic interdependence. Most studies generally find that trade either positively or negatively affects the prospect of conflict.¹⁴ The theoretical work that has generated these hypotheses takes trade as a given and then generates decision-theoretic analyses to determine the effect of trade on conflict. Assuming that there is no feedback effect from anticipation of the likelihood of conflict on key economic variables such as trade and investment does not help us understand why states will enter into a trade relationship in the first place. Failure to endogenize decisionmakers' choice to trade is a critical shortcoming of existing theoretical studies, for if trading states are integrated because they have already anticipated and internalized the likelihood of peace to be high, then one would expect to find a correlation between trade and peace in spite of the fact that trade is not in fact causing peace.

By changing the specification of the model to include both trade (or any other economic decision such as investment) and conflict escalation processes as decision variables, it becomes evident that the ex ante anticipatory effects of conflict mitigate the expected effects of economic interdependence. Assume a strategic interaction between states that are prospective traders instead of already economically interdependent. In a simplified interaction, state A can decide whether or not to trade with B, which then decides whether or not to initiate a conflict. If B chooses to coerce, then a typical conflict escalation sequence follows: A can concede or not, and B can decide whether to punish or escalate to war if A does not concede.

Under what conditions will A trade with B? Assuming that A most prefers trading peacefully but would rather not risk economic losses if there will be conflict or, worse, war where trade will likely be interrupted, then A will opt to restrict trade if it believes that B is going to coerce. This comports with intuitive expectations about rational, forward-looking economic actors. Why would a trader or investor sink costs into a relationship that is not predicted to have a long-time horizon because conflict is likely to occur?

If the likelihood of conflict discourages players from becoming economically interdependent, then interdependence results when players already anticipate peace between the two countries. We should expect interdependent dyads to be peaceful, with the exception of disingenuous dependence strategies and misperception, which we will discuss later. It is no wonder then that empirical work has shown a correlation, however inconclusive, between economic interdependence and peace. Guided by underdeveloped theory, empirical studies have consistently tested for the likelihood of conflict between already economically linked dyads, which tend to be peaceful because the threat of conflict motivates restrictions. However, this relationship stems from selection bias, not theoretically predicted causation.

Some have observed that political aspects such as traditional security concerns affect actors' economic activities.¹⁵ James Morrow (1999), who mentions the endogeneity problem overlooked by empiricists, produced the seminal contribution that interdependence is related to conflict bargaining. For Morrow, conflict occurs not merely because trade volume alters relative bargaining positions, but because misperception about each other's relative bargaining positions can cause conflict initiation and escalation. Outcomes of peace and conflict hinge on information about resolve each player has relative to its opponent. Because actual trade flows (and, by inference, other observable economic relations) only provide a sliver of relevant information about players' relative resolve, Morrow finds economic links to have an indeterminate effect on conflict.

While Morrow contributes to our understanding of economic interdependence and conflict as a strategic bargaining problem, his specification of the issue is nevertheless incomplete. In spite of his observation about the endogenous relationship between economic and political factors, Morrow does not examine the problem of interdependence as one in which players choose both to trade and to enter into conflict. In our view, correct formulation of a theory about economic interdependence requires that the analyst first ask why a country chooses to increase or decrease its economic links with its opponent.

Economic Interdependence and Dependence

We have explained that much of the economic interdependence scholarship is susceptible to the criticism that theoretical findings are not empirically demonstrable because of the endogeneity of actors' decisions to trade. Moreover, the literature lacks a rigorous analysis of the conditions under which misperception might occur. Erik Gartzke, Quan Li, and Charles Boehmer (2001) broke new ground by developing a formal model to study the underlying conditions and expected effects of states' decisions to liberalize or restrict economic links.¹⁶

Gartzke, Li, and Boehmer, like Morrow, develop a conflict bargaining model based on insights from recent advances in theories of dispute onset. However, unlike Morrow, they try to understand the role of economic restrictions. The model produces two main results. First, they argue for the weakness of the liberal opportunity cost argument. Outcomes of conflict and peace depend not on the benefits of trade, which liberals claim make war more costly, but on relative valuations of the benefits of interdependence and costs and benefits of fighting. Second, economic linkages, as policy instruments, expand the menu of signals from which states may credibly communicate resolve and reduce uncertainty, which lessens the chance that states will become entangled in a costly contest due to misperception. From these two main results the authors conclude that economic interdependence does in fact promote peace, but for reasons other than those derived from the traditional liberal argument. Their claim is that economic interdependence promotes peace because states can use economic linkages as signaling devices to deter major violent conflicts. Demonstrating that states can use ex ante trade restrictions to convey information about expected utility of conflict versus the benefits of interdependence uncovers an important angle previously concealed behind the endogeneity problem in the theoretical literature. However, the Gartzke, Li, and Boehmer argument is still incomplete because it does not consider the possibility that states might also perceive an opportunity to exploit economic relationships for political gain as intuited by Albert Hirschman (1945).

To illustrate, we use the example made by Gartzke, Li, and Boehmer. Suppose states A and B are competing over \$100. Player B makes a takeit-or-leave-it offer, $d, 0 \le d \le 100$, to A along with a linked threat to punish A with a fight if A decides to reject the offer. Thus, A's move consists in accepting or rejecting B's offer.¹⁷ States are assumed to have war costs and benefits along with some benefit, $h_{,}$ from being economically interdependent. Complete information about all values of both sides' war costs and benefits along with h_i make outcomes predictable. Assume fighting pays the expected value to both A and B of \$30 (expected value of fighting, \$50, minus war costs, \$20). If B knows the value of A's war benefits and costs along with the value of h_a , then it can offer A $30 - h_a$ to avoid a fight. As A's benefit from interdependence increases, B can make less and less of an offer to A and still avoid a fight. If, however, h_{a} is low, then B must make a higher offer to prevent war. Suppose h_a equals 10, which implies that player A's total expected utility from fighting for the political issue in dispute is higher than the benefits it stands to receive from the economic interdependence; B may be willing to offer d = 20, but only if what is left over for A exceeds its expected utility from fighting. Assume B's costs and benefits from fighting are the same as A's but B derives greater utility from the trade relationship, say $h_b = 20$. In this case, making a satisfactory offer to A will reduce B's utility from interdependence to 0, in which case B prefers conflict. Thus, as A's benefits from interdependence go down, B's relative utility for conflict goes up, even if both players still derive positive utility from trading and, interestingly, even if player B stands to gain more from interdependence than A. Thus, increases in trade do not directly translate into increases in peace, for a player may choose conflict even if it stands to lose a great deal from the cessation of interdependence whereas the same player could prefer to trade with a lower utility from interdependence if only the other player's benefits from interdependence were higher. This insight motivates the argument by Gartzke, Li, and Boehmer that opportunity costs take a backseat to relative valuations of trade interdependence versus war costs and benefits, for war can occur even with complete information about preferences and positive benefits from interdependence. Indeed, a player may choose war even if it stands to lose a great deal from the cessation of trade.

The complete information illustration is, however, not completely realistic. State decisionmakers are unlikely to know for certain other states' war costs and benefits or the benefits they derive from interdependence. Hence, if B's preferences are open information but it does not know about whether A favors war over interdependence, then B will have some difficulty choosing a level of d. Aware of the informational asymmetry, player A has an ex ante incentive to overstate its expected benefits from war or understate either h_a or its war costs. To simplify, we will call this kind of state "politics first"—that is, if its expected war benefits, which are largely weighted by its subjective valuation of winning the contested political issue, are greater than h_a and its war costs. In contrast, a state is called "economics first" if h_a and its war costs outweigh its expected war benefits. If A is actually politics-first and it anticipates that B is not going to make an acceptable offer, then it can send a costly ex ante signal to B by restricting interdependence. Player A's restriction will resolve B's uncertainty, thereby permitting B to adjust its offer accordingly. Gartzke, Li, and Boehmer's primary result is that trade leads to peace because it can serve as an instrument for signaling resolve and reducing uncertainty.

In spite of including trade as a move, the Gartzke, Li, and Boehmer approach is nevertheless still incomplete because it assumes that B's threat to fight is credible and that A has complete information about B's type. In their model there is no possibility that B might back down from its threat and that A is uncertain about whether that will happen. One might imagine, however, that under the right circumstances a decisionmaker in A's place might see an opportunity to take advantage of a gap in shared information and threaten to destabilize an existing economic relationship even though it knows it would never actually carry it out if A rejected the offer. Such a possibility makes way for Hirschman's dependence logic. States may perceive opportunities to exploit trade relationships for political gain.

Many in Taiwan fear Hirschman-type dependence in their relationship with China because of what it may end up costing them politically. Indeed, Chinese leaders have made clear their intention to provide incentives for Taiwan investment and trade in the mainland in order to bring about Taiwan's economic dependence and political vulnerability. As early as 1985, a Chinese Communist Party United Front Department document made the following statement: "We can definitely, step by step, lead Taiwan's industries to rely on our market as long as we adopt well-organized and well-guided measures. Continuing to develop these efforts would effectively lead us to control the operation of Taiwan's economy that would speed up the reunification of the motherland."¹⁸ And, according to Qian Qichen, Beijing's strategy has been "to blockade Taiwan diplomatically, to check Taiwan militarily, and to drag along Taiwan economically."¹⁹ If deliberate dependence is consistent with China's strategy, then it is consistent with its strategy that China may, at some point, see an opportunity to threaten cessation of trade and escalation of conflict if Taiwan does not accept some kind of agreement of unification. In deciding whether to accept or reject China's offer, Taiwan will be faced with uncertainty about whether it believes China will really carry out its threat or whether it will back down if Taiwan rejects the offer.

Thus, in developing a model of trade and conflict, it is important to connect trade and conflict in the most meaningful strategic method possible, which involves unfolding and analyzing the interaction between states in a way that endogenizes states' decisions to trade as well as states' decisions to threaten to use trade in an effort to extract political concessions and states' decisions to follow through with those threats by escalating conflict. Additionally, it makes sense to assume that both sides are uncertain about each other's utilities and war costs. By constructing a model to include these refinements, we find that we can capture the richness of the strategic trade-peace interaction that has previously been overlooked. Indeed, as we will demonstrate, our model derives significantly different outcomes than the Gartzke, Li, and Boehmer study. In particular, instead of deducing that trade leads to peace (though not because of liberal opportunity cost reasons), we demonstrate that not only is there no unconditional relationship between trade and peace, but widespread opportunities for bluffing actually increase the unintended chances of conflict.

Trade-Peace Model

We develop a two-player formal model in which neither player is certain whether it faces an economics- or politics-first opponent. The trade-conflict interaction consists of a series of moves in which states choose whether to trade and enter into a conflict. The game consists of two players, which for simplicity of presentation will be referred to as Taiwan and China. Taiwan first chooses whether to trade or not, after which China decides whether to exploit the trade relationship and coerce Taiwan. If Taiwan chooses to regulate trade, then a restricted trade status quo is obtained, and the game ends. However, if Taiwan decides to liberalize trade with China, Beijing is then in a position to begin to try to extract concessions from Taiwan. Peaceful economic integration occurs until China decides to coerce Taiwan, at which time Taiwan must decide if it will comply with China's threat to prevent an interruption in trade or if it will instead try to protect its security interests by refusing to comply. China's move to coerce is interpreted as a threat to sever interdependence and escalate conflict unless Taiwan accepts some arrangement on Taiwan's sovereignty as specified by China. If Taiwan complies, then it makes a political concession on its sovereignty but maintains its economic gains. On the other hand, if Taiwan refuses to comply, then China must decide whether to punish, which means that China will carry through with the threat and escalate conflict with Taiwan. If not, then China and Taiwan continue to trade. If, however, China punishes Taiwan, then trade is interrupted, and both suffer opportunity costs to lost trade in addition to the costs of conflict. The sequence of moves in this interaction is as follows (see Figure 1):

Taiwan:	(Liberalize Trade/Restrict Trade)
China:	(Coerce/Not Coerce)
Taiwan:	(Comply/Not Comply)
China:	(Punish/Not Punish)

There are five possible outcomes to this game:

- O1: (Status Quo)
- O2: (Taiwan liberalizes trade, China does not coerce)
- O3: (Taiwan liberalizes trade, China coerces, and Taiwan complies)
- O4: (Taiwan liberalizes trade, China coerces, Taiwan does not comply, and China does not punish Taiwan)
- O5: (Taiwan liberalizes trade, China coerces, Taiwan does not comply, and China punishes Taiwan)

Figure 1 Sequence of Moves Between Taiwan and China



Taiwan and China's preferences over these outcomes vary depending on each of their types. In the model with players' preferences over outcomes, we say that a player is economics-first if it prefers economic welfare gains to securing its political objectives. A player is politicsfirst if it is willing to sacrifice gains from trade for its political goals. Regardless of its type, it is assumed that Taiwan's first preference is to have gains from trade and peace with China (although a politics-first Taiwan prefers peace as a result of having China back down from its threat—O4—while an economics-first Taiwan would prefer not to be coerced by China in the first place—O2). The major difference between an economics- and politics-first Taiwan is how each responds to an anticipated conflict with China. An economics-first Taiwan prefers to concede when coerced rather than restrict trade and lose gains from trade (O3). This, however, is a politics-first Taiwan's least preferred outcome, for, if it perceives that it is likely to be coerced by China, it would rather restrict trade (O1) than have a politics-first China coerce and then punish it (O5), but it would prefer to fight and lose on the political issue (O5) than to acquiesce willingly when coerced (O3).

Taiwan's preference rankings organized by type can be summarized as follows:

Taiwan (economics-first): O2 > O4 > O3 > O1 > O5; and Taiwan (politics-first): O4 > O2 > O1 > O5 > O3.

Utilities can therefore be assigned according to the ordinal ranking in Table 1, where preferences over outcomes are ranked from 1 to 5, with 1 representing the most preferred outcome and 5 being the least preferred:

	Economy First	Politics First
01	a4	b3
O2	al	b2
03	a3	b5
O4	a2	b1
O5	a5	b4

Table 1 Ordinal Ranking of Utilities, Taiwan

China's preferences over the game's possible outcomes also depend on its type. It is assumed that regardless of its type, China, like Taiwan, most prefers to trade with Taiwan while Taiwan concedes on the political issue (O3). The major difference between a politics- and economics-first China is how each responds when Taiwan does not back down when coerced. Under these circumstances, a politics-first China prefers to escalate a conflict (O5) to not coercing Taiwan at all in the first place (O2). An economics-first China, in contrast, least prefers full conflict (O5) because it would rather secure gains from trade and peace, even if it has to back away from its threat (O4). A politics-first China least prefers this outcome (O4) because gains from trade come at too high a political cost.

China's preferences rankings are, therefore, as follows:

China (politics-first): O3 > O5 > O2 > O1 > O4; and China (economics-first): O3 > O2 > O4 > O1 > O5

Again, utilities can be assigned according to the ordinal ranking in Table 2, wherein preferences over outcomes are ranked from 1 to 5, with 1 representing the most preferred outcome and 5 being the least-preferred:

	Politics First	Economy First
01	x4	y4
O2	x3	v2
03	x1	v1
04	x5	v3
O5	x2	y5

Table 2 Ordinal Ranking of Utilities, China

Figure 2 represents the extended-form version of the interaction sequence in Figure 1 under conditions of incomplete information about both players' types. Given the sequence of moves for the game and the players' preferences over outcomes, we can evaluate the extended-form version of the game to see if dominated actions can be eliminated.

Solving the game, we discover that there are three equilibria, two of which are separating equilibria (see Appendix A for the formal analysis). In one, Taiwan will restrict trade only if it is politics-first; in the other, China will coerce only if it is politics-first. The other equilibrium is a pooling equilibrium, in which Taiwan will always liberalize trade, even if it is politics-first, and China will always coerce, even if it is economicsfirst. If, therefore, Taiwan ever decides to restrict trade, it reveals its type to be politics-first. And, if China ever chooses not to coerce, then it re-





veals itself to be economics-first. In other words, while only a politicsfirst Taiwan will restrict trade and an economics-first Taiwan will always liberalize trade, under certain conditions a politics-first Taiwan will liberalize trade and risk political vulnerability. China, in comparison, will always coerce Taiwan if it is politics-first, and only an economics-first China will choose not to coerce. However, under certain conditions an economics-first China might jump on an opportunity to coerce Taiwan and risk having Taiwan call its bluff by rejecting its offer.

What are the conditions under which (1) a politics-first Taiwan will risk political vulnerability by trading with China, and (2) an economics-first China will risk making a threat involving the cessation of trade that could be rejected by Taiwan? If a politics-first Taiwan believes that China is unlikely to coerce, it will risk trading with China. It will also consider trading to be more cost-effective as the value of the status quo relative to interdependence goes down and/or its war costs are low. An economics-first China will undertake the risk to threaten Taiwan if it thinks Taiwan is likely to back down. This result implies that Taiwan benefits from a reputation for being politics-first. If an economics-first China believes that Taiwan is politics-first, then Taiwan can take advantage of that belief and trade with China without fear of being coerced. China will also become more willing to risk coercing Taiwan as its gains from winning on the political issue go up relative to its benefits from interdependence and as its costs to being rejected by Taiwan go down. Costs for having Taiwan call its bluff can be severe, especially since China reveals itself as economics-first when it does not punish after making a coercive threat.

The game model implies the possibility of certain outcomes' being realized in equilibrium. As the first mover, Taiwan can choose whether to continue implementing trade restrictions or to liberalize trade with China. As implied by the conditions derived from the equilibrium results, Taiwan's decision is both a function of its own type and its perception of China's type. Taiwan will be more likely to choose to restrict trade if it is politics-first and if it perceives that the likelihood of China being politics-first is high, its profits from trade are not high, or China's punishment can seriously harm Taiwan. This makes practical sense, because if Taiwan is politics-first and it believes that China is likely to initiate a conflict, then Taiwan will prefer to incur the cost of lost trade than to allow itself to become economically vulnerable. Once Taiwan chooses to restrict trade, China knows that Taiwan is politics-first. In a realistic situation, a weak Taiwan can choose to restrict trade so as to convince China that it is strong. If, however, Taiwan is not politics-first or if it believes that China is likely to be economics-first, then Taiwan will prefer liberalized trade to restricted trade. That is, if Taiwan values economic gains above security, then it will liberalize trade even if it believes that there is a high likelihood that China seeks unification. Additionally, even if Taiwan puts political goals ahead of economic goals, it will prefer to liberalize trade as long as it believes that China is likely to be economics-first.

If Taiwan chooses to liberalize trade, then China decides whether or not to coerce Taiwan. China's decision to coerce is a function of its own type and its perception of Taiwan's type. China will choose not to coerce if it is economics-first and if it perceives that the likelihood of Taiwan's being politics-first is high. This also makes sense, because China prefers not to coerce Taiwan in the first place if doing so means that it will likely end up not punishing a noncompliant Taiwan. If China chooses not to coerce, then Taiwan knows that China is economics-first and, therefore, can update its beliefs about China's type correspondingly. China will coerce Taiwan, however, if it is either politics-first or economics-first but it perceives that there is a high likelihood that Taiwan is economics-first. That is, if China values unification above any of the benefits of cross-strait trade, then it will coerce Taiwan whether it believes Taiwan to be economics- or politics-first. Furthermore, even if China is economics-first, it is still possible that it may choose to coerce if it believes that Taiwan is likely to comply when coerced.

Unlike the first two moves of the game, the moves following China's decision to coerce depend solely on each player's type. Taiwan will only make concessions if it is economics-first, and only a politicsfirst China will punish a noncompliant Taiwan. This means that Taiwan will never comply with China's coercive threats if it is politics-first. If China is politics-first, then it will always choose to enforce its demands with a punishment if Taiwan decides not to comply with China's threats. On the other hand, an economics-first China will not punish a noncompliant Taiwan. Thus, O5 should only result when misperception occurs, for a politics-first Taiwan will not liberalize trade and risk the escalation of a conflict unless it perceives that China is economics-first and, therefore, unlikely to coerce. And, China will only coerce if it is politics-first, in which case Taiwan is unlikely to have liberalized trade in the first place, or if it perceives that Taiwan is economics-first and therefore likely to comply when coerced.

Conclusion

Building on the insights offered by Hirschman, Morrow, and Gartzke, Li, and Boehmer, we have developed a comprehensive model of economic interdependence, dependence, and peace. From the foregoing analysis, we derive the following main results.

First, economic linkages and peace are in fact interrelated, but not in the way that traditional analysts have believed. Unconditional correlations between economic interdependence and either peace or conflict are nonexistent. Economic interdependence is much more complex and cannot be fully understood without asking why states liberalize and restrict trade and without investigating the role of economic dependence. Second, interdependence provides opportunities for states to bluff and develop reputations. Economics-first states can try to convince opponents that they are actually politics-first in order to extract larger concessions from opponents, although Gartzke, Li, and Boehmer have convincingly demonstrated that severing interdependence will remove this incentive. On the other hand, politics-first states can try to develop reputations for being economics-first by fostering economic linkages instead of severing them. If a politics-first opponent that would otherwise sever economic ties perceives that the other state is politically weak, it will likely trade with its opponent to try to secure both political and economic gains. The bluffing state can exploit its opponent's misperception of its type for political gain.

Finally, interdependence does not necessarily reduce conflict. Because both economics-first and politics-first states have incentives to misrepresent their types, there are possibilities for conflict due to misperception especially between trading states. Gartzke, Li, and Boehmer have shown that misperception can be alleviated if states restrict economic ties, but no such signal exists for a state to call out the bluff of a politics-first state trading in order to convince its opponent that it is economics-first and to induce dependence. If one of the trading states is actually trading disingenuously for the purpose of inducing dependence, then either it will succeed in extracting larger concessions from its opponent or violent conflict will break out.

Much of the discussion in the present analysis relies on the China-Taiwan case. However, the case of China and Taiwan merely serves as inspiration for the study, because it provides a dynamic example of a strategic trade-conflict interaction and also poses as a counterexample to prevailing trade-conflict theory. Thus, although the model is based on the China-Taiwan case, we observe that trade-conflict interactions generally are determined by considerations not only of decision-theoretic maximization of economic and political utility but also of players' anticipation of their opponents' unknown preferences. Moreover, the move sequence modeled herein reflects the general trade-conflict interaction that we would expect to reflect the behavior of states facing decisions involving political and economic tradeoffs. Thus, we would expect the results from our model to apply generally to other cases of trade and conflict.

However, the formal model also has implications for the current economic and security relationship between China and Taiwan. First, as long as Taiwan restricts trade, it is building a reputation as politics-first. We have showed in our analysis that Taiwan can benefit from a politics-first reputation when trading with an economics-first China. In order to build a politics-first reputation, Taiwan's decisionmakers need to have an established track record of restricting trade. Newly elected decisionmakers will have to borrow from established reputations of past leaders, which is only possible if something about the new leader, such as party affiliation or voting record, creates the perception that the incoming leader is at least as politics-first as previous leaders who had established reputations as being politics-first. This occurred after Chen Shui-bian was elected president. Because President Lee, who at the time was chair of the KMT, bore the costs of restricting trade during his term in office, Chen can lean on his DPP credentials to position himself credibly as a leader at least as politics-first as Lee. Consequently, he can continue to restrict trade if he believes that China is politics-first, or he can liberalize trade without fear of coercion if he believes that China is unlikely to use trade to extract concessions on Taiwan's sovereignty. In fact, trade liberalization has moved along sluggishly during Chen's administration. Although Beijing presses for more direct links between China and Taiwan, Chen is reluctant to loosen existing restrictions, signaling his perception that China is politics-first. It appears that the current arrangement of officially restricted trade and high trade volume reflects the administration's best attempt to apply a brake to an economic relationship that could potentially explode beyond control if trade were liberalized.

Second, if Taiwan decides to liberalize trade, there is some risk for an economics-first China in both coercing and not coercing. The longer China takes to coerce Taiwan once trade has been liberalized, the more it signals that China is economics-first, in which case a politics-first Taiwan might be willing to sustain liberalized trade without fearing political vulnerability. In contrast, if an economics-first China misperceives a liberal, politics-first Taiwan's type to be economics-first, then China will coerce, get rejected by Taiwan, and then back down. Once Taiwan observes this, then it will continue to trade fearlessly, for China's type will have been revealed to be economics-first.

Finally, is cross-strait trade leading to cross-strait peace, or conflict? Because trade restrictions still exist, it is difficult to predict how economic interdependence is going to affect the likelihood of conflict down the road. There are two possible ways that Taiwan's decision to liberalize trade or not can initiate a shift away from the status quo. As explained previously, the most we can infer about the status quo is that Taiwan is likely to be politics-first both because of President Chen's reputation and because of his choice to retain trade restrictions. Because Taiwan does not take advantage of its politics-first reputation to liberalize trade, it is likely also the case that Taiwan perceives that China is also politics-first. The first way Taiwan can initiate a move away from the status quo is if Chen is replaced by an economics-first presidential candidate. Taiwan would liberalize trade, and China would then decide whether it believed the new Taiwan was economics- or politics-first. If China chose not to coerce, then eventually we would have to conclude that both China and Taiwan are economics-first, and economic interdependence would result in a new peaceful status quo. If China decided to coerce, then Taiwan would concede and there would be a healthy trade relationship and a new political arrangement that would include less Taiwan sovereignty and more unification.

The second way that Taiwan's move could alter the status quo is if Chen Shui-bian began to lean on his reputation as a politics-first leader and decided to liberalize trade with the hope that China would not coerce. A politics-first Taiwan would only do this if it believed China was economics-first. If Taiwan perceived China's type correctly, then China would do one of two things. If it believed Taiwan's politics-first reputation, it would welcome the trade relationship and avoid coercing Taiwan. A new peaceful status quo would be obtained. If it did not believe Taiwan's politics-first reputation, it would try to coerce in an effort to achieve gains both from economic interdependence and on the sovereignty issue. However, a politics-first Taiwan would reject the threatening offer, and China would back down. The new status quo would be one of economic interdependence, but China's economics-first type would be uncovered and Taiwan would make gains both economically and on the sovereignty issue. It is, however, possible that a politics-first Taiwan could liberalize trade because it misperceives that China is economics-first. The politics-first China would decide to coerce Taiwan, and because neither side would back down from that point on, conflict would result. Thus, misperception in the cross-strait economic relationship could land both China and Taiwan in an unintended war.

Because understanding the trade-conflict relationship hinges on mutual perceptions, we could get some leverage on the Taiwan-China problem by conducting public opinion surveys that target questions to help us learn about voters' perceptions toward China. For example, if we knew what Taiwanese people believed China would do if Taiwan suddenly summarily liberalized trade, we could infer whether they believed that China was politics- or economics-first. That would likely give us a better understanding of the reasons why political leaders persistently resist liberalizing trade with China. It would also be valuable to discover if voters believe China would use a liberal trade relationship to extend a coercive threat and if they believe China would back the threat with force. Public opinion analysis could also help us understand Taiwan voters' own preferences on trade restrictions versus liberalization. Would, for example, Taiwanese favor unconditional liberalization? What about complete liberalization if China was unlikely to coerce? Such questions would help us learn whether Taiwan voters are putting economics first or politics first. Although reliable public opinion analysis in China is difficult to obtain, just understanding Taiwan voters' perceptions and preferences about these issues can give us a great deal of valuable information that will improve our ability to further understand and predict economic and political behavior between China and Taiwan.

Appendix A

The extended-form version (Figure 2) shows that a politics-first China will always coerce and then punish if given the chance, but an economics-first China will never punish if Taiwan refuses to comply. A politics-first Taiwan will not comply if coerced, but an economics-first Taiwan will comply. Solving the game, we see that it results in three strategy profiles, which can be sustained as equilibria under some conditions: (E1) {(llc~c), (ccp~p)}, (E2) {(lrc~c), (ccp~p)}, and (E3) {(llc~c), (c~cp~p)}, where *l* means liberalize, *r* restrict, *c* coerce, and *p* punish.

E1 is a pooling equilibrium. It means that Taiwan will liberalize trade regardless of its type, even if it is politics-first. And, China will coerce always, even if it is economics-first. For E1 to be a viable equilibrium strategy solution, the following inequalities must be satisfied:

- (1) (q)b4 + (1-q)b1 > b3; and
- (2) (p)y1 + (1-p)y3 > y2,

where q is the probability that China is politics-first, p is the probability that Taiwan is economics-first, and the variables represent players' outcomes (i.e., b1, b3, and b4 represent a politics-first Taiwan getting its first, third, and fourth most preferred outcomes respectively, and y1, y2, and y3 represent an economics-first China obtaining its first, second, and third most preferred outcomes, respectively).

From equation (1) we see that a politics-first Taiwan will prefer trade with China if (a) Taiwan perceives that China is more likely to be economics-first (the value of q is low), (b) Taiwan's utility derived from cross-strait trade is higher than its utility from the status quo (b1-b3 is high), and (c) Taiwan experiences little economic harm if China chooses to punish Taiwan (b3-b4 is low).

Equation (2) implies that an economics-first China will coerce Taiwan when (a) it perceives that Taiwan is more likely to be economicsfirst (the value of p is high), (b) the utility derived from attaining political concessions from Taiwan outweighs China's gains from cross-strait trade (y1-y2 is high), and (c) China does not suffer a high cost if Taiwan chooses not to comply and China does not punish Taiwan (y2-y3is low).

If the foregoing conditions are met, then E1 is the equilibrium solution. There are, in equilibrium, three possible outcomes that can be inferred from the strategy pairs of E1. The first possible outcome is that Taiwan will always choose a liberal trade policy (Taiwan is economicsfirst) and, if coerced, it may make political concessions to China. The second possible outcome is that Taiwan may refuse to comply with China when coerced, and China may choose to punish Taiwan (both Taiwan and China are politics-first). Finally, Taiwan may refuse to comply when coerced, but China may choose not to punish Taiwan when it does not comply with China (Taiwan may be politics-first while China is economics-first).

E2 is a separating equilibrium, which implies that Taiwan will liberalize trade when it is economics-first but will restrict trade when it is politics-first. China's strategy remains unchanged from E1; it will coerce, even if it is economics-first. For E2 to be a viable equilibrium, the following inequality must be satisfied:

(3) (q)b4 + (1-q)b1 < b3.

Equation (3) shows that in order for an economics-first Taiwan to prefer liberalization and a politics-first Taiwan to prefer trade restrictions, (a) Taiwan must perceive China to be more likely to be politics-first (q is high), (b) profits from trade are not high (b1-b3 is low), and (c) China's punishment can seriously harm Taiwan (b3-b4 is high). The strategy profile for E2 implies that either Taiwan is economics-first and complies with China when coerced or Taiwan is politics-first and chooses the perpetuation of the status quo (O1).

E3 is another separating equilibrium, because although Taiwan will liberalize trade even if it is politics-first, China will only coerce if it is

politics-first. For E3 to be the game's equilibrium outcome, the following inequalities must be satisfied:

- (4) (q)b4 + (1-q)b2 > b3; and
- (5) (p)y1 + (1-p)y3 < y2.

From equation (4) we see that, in equilibrium, Taiwan will always choose liberalization over trade restrictions when (a) it perceives that China is more likely to be economics-first (the value of q is low), (b) trade profits are high (b2-b3 is high), and (c) Taiwan experiences little economic harm if China chooses to punish Taiwan (b3-b4 is low).

Equation (5) implies that an economics-first China will not coerce and a politics-first China will coerce if (a) China perceives that Taiwan is more likely to be politics-first (p is low), (b) there is little gain from attaining a political concession from Taiwan (y1-y2 is low), and (c) China suffers a high cost if it chooses not to punish Taiwan when Taiwan does not comply.

If these conditions are met, then E3 is the equilibrium solution and one of the four following outcomes may be obtained. First, Taiwan liberalizes and China does not coerce, thus revealing China to be economics-first. Second, China chooses to coerce, and an economics-first Taiwan may make the political concessions necessary to maintain cross-strait trade. Third, a politics-first Taiwan may elect not to comply with China's demands, and a politics-first China may choose to punish Taiwan. Fourth, an economics-first China may decide not to punish a politics-first Taiwan for not complying.

Brett V. Benson (PhD, Duke University, 2006) is assistant professor of political science at Vanderbilt University. His most recent article is "Public Opinion, Foreign Policy, and the Security Balance in the Taiwan Strait," with Emerson M. S. Niou, *Security Studies* 14, no. 2 (Winter 2004/05). His research focuses on international relations theory, Chinese and East Asian politics, and political applications of game theory.

Emerson M. S. Niou (PhD, University of Texas at Austin, 1987) is professor of political science at Duke University. His recent publications include "A Theory of Economic Sanctions and Issue Linkage," with Dean Lacy, *Journal of Politics* 66, no. 1 (February 2004): 25–42; and "Understanding Taiwan Independence and Its Policy Implications," *Asian Survey* 44, no. 4 (July–August 2004): 555–567. His current projects concern studies of institutions and reforms in China, security balance in the Taiwan Strait, and the calculus of voting.

Notes

1. Data source: Ministry of Economic Affairs, People's Republic of China.

2. Data source: Ministry of Finance, People's Republic of China.

3. For reviews of this literature, see Edward D. Mansfield and Jon C. Pevehouse, "Trade Blocs, Trade Flows, and International Conflict," *International Organization* 54 (2000): 775–808; Katherine Barbieri and Gerald Schneider, "Globalization and Peace: Assessing New Directions in the Study of Trade and Conflict," *Journal of Peace Research* 36 (1999): 387–404; Susan M. McMillan, "Interdependence and Conflict," *Mershon International Studies Review* 41 (1997): 33–58.

4. Karl W. Deutsch, *The Analysis of International Relations* (Englewood Cliffs, NJ: Prentice Hall, 1968); Karl W. Deutsch, Sidney Burrel, Robert Kann, Maurice Lee, Martin Lichterman, Raymond Lindgren, Francis Loewenheim, and Richard van Wagenen, *Political Community and the North Atlantic Area* (Princeton, NJ: Princeton University Press, 1957).

5. Soloman W. Polachek, "Conflict and Trade," *Journal of Conflict Resolution* 24 (1980): 55–78; Richard Rosecrance, *The Rise of the Trading State* (New York: Basic, 1986); Dale Copeland, "Economic Interdependence and War: A Theory of Trade Expectations," *International Security* 4 (1996): 5–41.

6. Presidents Lee and Chen both have stated that the cross-strait trade can improve the prospect for peace. "Entire Mainland China May Be 'Tai-wanized': Lee," Central News Agency, June 24, 1999; and Jason Blatt, "Chen Hoping [Information Technology] Can Help Bridge Strait," *South China Morning Post*, June 13, 2000. Both quoted in Paul J. Bolt, "Economic Ties Across the Taiwan Strait: Buying Time for Compromise," *Issues and Studies* 37 (2001): 80–105.

7. Emerson M. S. Niou, "Understanding Taiwan Independence and Its Policy Implications," *Asian Survey* 44, no. 4 (2004): 555–567; Brett V. Benson and Emerson M. S. Niou, "Public Opinion, Foreign Policy, and the Security Balance in the Taiwan Strait," *Security Studies* 14, no. 2 (2004/2005): 1–16; John Hsieh and Emerson M. S. Niou, "Measuring Taiwanese Public Opinion on the Taiwan Independence Issue: A Methodological Note," *China Quarterly* 181, no. 1 (2005): 158–168.

8. *Managing the Taiwan Issue: Key Is Better US Relations with China*. Report of an independent task force, sponsored by the Council on Foreign Relations, 1995.

9. For an in-depth analysis of China's missile development, see Changsheng Lin and Emerson M. S. Niou, "Assessing China's Military Preparation to Deter the US from Intervening in the Taiwan Strait Conflict," *Mainland China Studies* (November–December 2003).

10. Taiwan Affairs Office of the State Council website, "The One-China Principle and the Taiwan Issue," Taiwan Affairs Office and the Information Office of the State Council, People's Republic of China, February 21, 2000, http://

www.gwytb.gov.cn:8088/detail.asp?table=WhitePaper&title=White%20 Papers%20On%20Taiwan%20Issue&m_id=4.

11. For an explanation of China's draft Anti-Secession Law, see Zhaoguo Wang, vice chairman of the Standing Committee of the National People's Congress, "Explanations on Draft Anti-Secession Law," Third Session, 10th National People's Congress and Chinese People's Political Consultative Conference, March 8, 2005, http://www.china.org.cn/english/2005lh/122118.htm.

12. Most notably, Albert O. Hirschman, *National Power and the Structure of Foreign Trade* (Berkeley: University of California Press, 1945); and Robert Gilpin, "Economic Interdependence and National Security in Historical Perspective," in K. Knorr and F. Trager, eds., *Economic Issues and National Security* (Lawrence: Regents Press of Kansas, 1977).

13. See, for example, Christopher Dent, "Navigating Taiwan's Foreign Economic Policy," *Issues and Studies* 37 (2001): 1–34; Gary H. Jefferson, "Like Lips and Teeth: Economic Scenarios of Cross-Strait Relations," in Gerrit W. Gong, ed., *Taiwan Strait Dilemmas: China-Taiwan-US Policies in the New Century* (Sacramento: CSIS Press, 2000), pp. 97–116; Ping Deng, "Taiwan's Restriction of Investment in China in the 1990s," *Asian Survey* 40 (2000): 958–981.

14. For a survey of empirical studies of the trade-conflict relationship, see Barbieri and Schneider, "Globalization and Peace," pp. 387–404.

15. Brian M. Pollins, "Conflict, Cooperation, and Commerce: The Effect of International Political Interactions on Bilateral Trade Flows," *American Journal of Political Science* 33, no. 3 (1989): 737–761; James Morrow, "How Could Trade Affect Conflict?" *Journal of Peace Research* 36, no. 4 (1999): 481–489; James D. Morrow, Randolph M. Siverson, and Tressa E. Tabares, "The Political Determinants of International Trade: The Major Powers, 1907–90," *American Political Science Review* 92 (1998): 649–661.

16. Erik Gartzke, Quan Li, and Charles Boehmer, "Investing in the Peace: Economic Interdependence and International Conflict," *International Organization* 55, no. 2 (2001): 391–438.

17. Gartzke, Li, and Boehmer (2001) actually have player A make the offer. We switch A with B to keep the sequence consistent with the interaction specified in Figure 1.

18. Wu Hsin-hsing, *Bridging the Strait: Taiwan, China, and the Prospects for Reunification* (Hong Kong: Oxford University Press, 1994), 171, quoted in Bolt, "Economic Ties Across the Taiwan Strait," pp. 80–105.

19. This is allegedly a direct quote taken by the Hong Kong media from Qian's speech at an undisclosed national working meeting among Taiwan affairs officials held in Fuchian (December 1993), quoted in Yunhan Chu, "The Political Economy of Taiwan's Mainland Policy," *Journal of Contemporary China* 6 (1997): 229–258.

Copyright of Journal of East Asian Studies is the property of Lynne Rienner Publishers and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.