

INTERDEPENDENCE AND CONFLICT: WHEN DOES SYMMETRY MATTER? ¹

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Abstract This article introduces an alternative to the study of economic interdependence and interstate conflict. Typically, scholars have relied upon relative levels of economic activity to characterize symmetry in interdependence. Instead, I argue that the key to understanding the role of symmetry in interdependence and conflict lies in the relationship between a state's exit (opportunity) costs and the costs it is willing to bear in the face of political conflict with another state. Asymmetry with respect to two states' exit costs/threshold relationships can generate bargaining power that constrains the use of force. This approach improves our understanding of the complex relationship between interdependence and conflict. It also suggests that current measurements of economic interdependence may fail to identify situations where interdependence plays a role in conflict.

INTRODUCTION

The post Cold-War era has produced ample discussion by scholars, media, and policy-makers of a new world characterized by a remarkable surge in global economic activity. Buzzwords such as globalization, integration, and interdependence abound. Indeed, the world is experiencing a growth of economic exchange between nations that has its roots in the end of the Second World War. The global trade volume has increased sixteen-fold in less than fifty years, almost three times the increase in total output (Economist, 1997).

While it is apparent that the web of economic ties that link nations and their populations will continue to grow in the short run, the impact this web will have on the political interaction among nations is less obvious. Will these states lose their ability to choose freely from the slate of political strategies as they become more dependent upon

one another for goods and services? If not, will these economic ties constrain a nation's ability to use force against other nations? Typically when we think of economic ties among nations (whether we call it globalization, interdependence, or integration), the focus is on the welfare gains that result from opening market access and increasing trade. If economic interdependence influences the political behavior of states, it is worth digging a bit deeper to uncover the political ramifications of these economic relationships. Specifically, we need to understand how economic ties influence the decision to use military force. As world leaders continue to strive for increased economic linkages, the consequences for conflict may reshape the way we study world politics.

THE PUZZLE

Over half a century has passed since Albert Hirschman wrote *National Power and the Structure of Foreign Trade* (1945), yet it remains a persuasive argument in favor of the importance of political influence generated by an interstate economic relationship. The central argument proposes that the mere potential for interrupting trade can lead to bargaining power in interstate politics. This potential for trade interruption creates a political opportunity for the state that is best suited to cope with the trade loss. Such opportunities are fueled by the threat of severing or altering the economic relationship.

Decades later, Keohane and Nye (1989) echoed Hirschman's analysis that asymmetry can generate political bargaining power. They argue that asymmetrical economic interdependence provides a political resource to the less dependent state. This state can effectively threaten to make changes in its economic relationships with more dependent states to bring about political change. Like Hirschman, Keohane and Nye do

not specify the mechanism by which states link their relative economic power to a favorable political outcome. They simply postulate that asymmetry in interdependence provides bargaining power in politics.

Not all scholars have been supportive of the idea that economic ties can generate political influence. The critique set forth by Wagner (1988) calls into question this notion of bargaining power from economic interdependence. The basic thrust of this critique is that while the arguments of Hirschman and Keohane and Nye seem highly intuitive, they suffer from several key flaws. Wagner points out that Hirschman's arguments suffer from what Harsanyi (1977) labeled "the Blackmailer's Fallacy." This fallacy is the belief that if nation B would rather give in to a demand by another nation A than suffer some form of punishment, then it is possible for nation A to successfully extract this demand by merely threatening nation B with the punishment.² Wagner argues that this logic "ignores the importance of the value that A assigns to the [demand] in question, as well as the cost to A of executing the threat" (474).

In essence, the danger here is in ignoring the possibility that nation A has made a threat that it cannot enforce if challenged by nation B. If the threatened punishment is more costly to nation A than foregoing its demand, then nation A may find itself unable to follow through on the threat. Baldwin (1985) also recognizes the need to assess the relative costs and benefits associated with the demand and the threat for each actor. It is crucial to be able to compare the value of the demand for each with the cost of executing or enduring the consequences of the threat associated with the demand.

Wagner's strongest criticism, however, is reserved for Keohane and Nye's argument that it is the asymmetry in interdependence that generates bargaining power.

Relying on a Nash bargaining game in his analysis, he concludes that asymmetrical interdependence as defined by relative dependence upon one another does not generate political influence for the less dependent state. Any successful link between economic interdependence and political influence has to make both states better off than if they had bargained over the economic dimension alone. Further, this result has nothing to do with the asymmetry in the economic ties.

Wagner has encountered little response to his critique. Keohane and Nye (1989: 252) concede that asymmetries do not provide necessary or sufficient conditions for bargaining power, although they do not interpret his critique as derailing their general approach. Wagner bases his analysis on a story where two players of unequal strength and wealth are negotiating over how to split a fixed pile of money. In the event that the players cannot come to an agreement over the distribution of the money, both sides walk away with nothing. In this story, evaluating asymmetry and bargaining power depends on how the division of this money can be influenced by the less dependent player.

At the heart of the Keohane and Nye argument, however, is the idea that economic tools are substitutable for military ones. The political issue is not a rider attached to the negotiations over the distribution of cash, but rather it is the primary subject of negotiation. More importantly, if the two players cannot come to an agreement over how to distribute the pile of money, or whatever issue they are bargaining over, they will consider fighting over it instead of walking away. Wagner's conclusions may be a function of the game he chooses to represent the bargaining situation.

If this is the case, then perhaps the bargaining model employed by Wagner is inappropriate. Wagner perhaps does not fully consider the options facing these nations if

they fail to resolve their dispute using economic leverage. If an economic relationship is exploited by one state to influence another over an issue or dispute that may alternatively be addressed in the military arena, then the costs and benefits of this military alternative need to be considered. Not reaching a bargaining agreement may lead states to forfeit the pile of money or issue the states are bargaining over; but it may also lead to a fight.

If two states are negotiating over an issue that may be the subject of a potential military dispute, then the specter of the military option should enter their decision calculations. If bargaining with economic interdependence works the way Keohane and Nye suggest, then it serves as a proxy battlefield, more efficient and far less costly than its military alternative. Economic costs are not the only potential costs to be considered here. Nations weigh these exit costs against the alternatives: leaving the dispute unresolved, or resolving the dispute via military means. This cost-benefit analysis is more complex than the basic cost-benefit analysis discussed above. Its complexity highlights the need for theory that explicates the causal linkage between economic interdependence and political conflict.

In the next section, I present an alternative to the bargaining model used by Wagner. Wagner is correct that the only way to establish definitively the utility (or lack thereof) of economic interdependence as a political tool is through the development of more explicit theory. The informal arguments set forth by Hirschman and Keohane and Nye are intuitive, but in the end are unable to stand up to Wagner's analysis. This is because both Hirschman and Keohane and Nye suggest that economic interdependence affects politics but never elaborate how this linkage occurs. Wagner's formalization of

this linkage is important in that it demonstrates the need for an explicit theory, but in the end it overlooks the role of high-level conflict and the political issues at stake.

THE EXIT MODEL

The essential characteristics of the game (see Figure 1) involve the attempt to use a dyadic economic relationship by one state to extract demands from the other state.³ Prior to the start of the game, the two states exogenously assume a challenger (**Ch**) or target (**T**) role. **Ch**'s main objective in the game is to use its economic ties with **T** as leverage in a political bargaining process. To accomplish this goal, **Ch** may issue a demand, accompanied by a threat of economic exit by **Ch**. Economic exit is defined here as some form of costly severing of the economic relationship.⁴ **T** makes the second move of this game: it can either comply with or reject **Ch**'s demand. If **T** complies, the game ends with **Ch** gaining the utility of its demand, v_{Ch} , and **T** losing v_T .

If **T** rejects the initial demand, the game continues with **Ch**'s second move. **Ch** can either make good on its threat of economic exit or back down, withdrawing its demand. Exiting the economic relationship does not relinquish the demand, however. Instead, **Ch** attaches the threat of military force to this demand, and prepares to shift the bargaining arena from economic to military dimensions. If **Ch** does not exit the economic relationship, the game ends with **T** calling its bluff. This brings with it audience costs, r_{Ch} , for **Ch**, and rewards, r_T , for **T** (Fearon 1994). These audience costs can be domestic or international. Being caught bluffing reveals incompetence in the leader's foreign policy skills (Smith 1996) to domestic constituencies. At the international level, bluffing can lead other states not to take **Ch** seriously in the future.

On the other hand, **T** enjoys the rewards that come with successfully standing up to **Ch**'s demands. This enhances **T**'s stature both at home and abroad.

If **Ch** elects to act on its threat and exit the relationship, **T** makes its final move of the game. Again, it chooses between rejecting and accepting **Ch**'s demand. If **T** complies, the game ends with **Ch** gaining the value of its demand, v_{Ch} , minus the costs that it incurs in the process of economic exit, e_{Ch} . **T** not only loses its value of the demand, v_T , but also the costs it endures from economic exit, e_T . If **T** rejects the demand, then the use of the economic threat to gain political demands has failed, and the states escalate to the use of high-level conflict (i.e., militarized conflict).

For simplicity, I represent the outcome of this escalated conflict as a lottery. This simplification focuses the analysis on how two states get involved in conflict. **Ch** wins the escalated conflict with probability p and loses with probability $1-p$. Win or lose, both states must pay the costs of economic exit, as well as a new set of costs associated with the high-level conflict. If **Ch** wins, it receives $W_{Ch} = v_{Ch} - e_{Ch} - c_{Ch}$, and **T** receives $L_T = -v_T - e_T - c_T$. If **Ch** loses, it receives $L_{Ch} = -e_{Ch} - c_{Ch}$, and **T** receives $W_T = -e_T - c_T$. Combining these outcomes with the lottery reveals an expected utility of $p(v_{Ch} - e_{Ch} - c_{Ch}) + (1-p)(-e_{Ch} - c_{Ch})$ for **Ch** and $p(-v_T - e_T - c_T) + (1-p)(-e_T - c_T)$ for **T**.

[Figure 1 about here]

MODEL PREDICTIONS

Solving for the states' exit costs reveals *exit cost thresholds*, e_{CH}^* and e_T^* , such that, $e_{Ch}^* = p(v_{Ch}) - c_{Ch}$ and $e_T^* = (1 - p)v_T - c_T$. The economic exit costs (e_{Ch} and e_T) and the exit cost thresholds (e_{Ch}^* and e_T^*) show the tipping points for the equilibria of the game.⁵ An exit cost threshold is the level of exit costs beyond which a player cannot endure the exit. It sets a state's limit for the costs it is willing to bear in order to get (or hold onto) something that another state has (or wants). The model not only posits the existence of these thresholds, it informs us how they are calculated by the states in the game. This is important because we will see below that it is the relationship between a state's actual exit costs and its exit cost threshold that determines whether economic interdependence affects its strategy with respect to political conflict.

Examining the relationship between actual exit costs and exit cost thresholds for **Ch** and Target reveals the following three equilibrium solutions to the model. When **Ch**'s exit costs are greater than its exit cost threshold but **T**'s exit costs are less than its threshold ($e_{Ch} > e_{Ch}^*$ and $e_T < e_T^*$), then **Ch** is deterred from making a demand. This is the *constraint equilibrium*, because **Ch** here is constrained by the economic relationship. When both players' exit costs are less than their exit cost thresholds ($e_{Ch} < e_{Ch}^*$ and $e_T < e_T^*$), then the conflict escalates (the *crisis equilibrium*). Lastly, when **T**'s exit costs exceed its exit cost threshold, ($e_T > e_T^*$), **Ch** makes a demand and **T** complies. This is the *bargaining power equilibrium*, as **T**'s level of interdependence affords **Ch** bargaining power.

The exit model is a simple theory of interstate interaction. By explicitly modeling the role of economic exit in political decision-making, I have specified the complex relationship between economic interdependence and political conflict. Several of the assumptions underlying the model can be relaxed to make the model more realistic and complex. For example, we can relax the assumption that the value each state associates with the demand (v_{Ch} , v_T) is public information. Since this information is key to the derivation of exit cost thresholds, allowing one or both states to hold private information in this way obscures the opponent's view of the exit cost-to-cost threshold relationship.

This private information introduces the opportunity for states to bluff. A challenger may threaten economic exit even when its exit costs exceed its thresholds while the target's do not. **T** may reject **Ch**'s initial demand although it faces exit costs that exceed the **T**'s exit cost threshold. These strategies are plausible in a world of incomplete information regarding exit cost thresholds. With assumptions of complete information in place, however, the model predicts that states will not incur economic exit except in situations where high-level conflict ensues. The logic is clear: if both states have complete information about the other state's threshold levels, then they know *a priori* whether economic exit will be effective. If **Ch** knows that **T** faces exit costs that fall beneath its threshold, then it will only initiate a demand if it is prepared to escalate the conflict to high levels. In the real world, we do sometimes observe economic exit without high-level conflict (i.e., the U.S. grain embargo against U.S.S.R. in 1979). This behavior is off the equilibrium path in the exit model developed above; due either to errors by decision-makers in the real world or (more likely) to an artifact of an assumption in the model that does not hold in all situations. This second explanation

suggests that future research should begin with this generalization of the exit model to incorporate incomplete information in the economic relationship.

Before moving on to a discussion of how the exit model revises the way we should think about symmetry in interdependence and its impact on conflict, the next section presents an illustration of the exit model. The following brief discussion of the United States (as the challenger) and South Africa (as the target) illustrates the constraint equilibrium of the exit model.⁶

AN ILLUSTRATION

During the decades in which a small minority of white South Africans ruled with a repressive government over a nation with a vast majority of black South Africans, the world repeatedly called for the end of Apartheid. The United Nations, the European Community, and even the United States imposed economic sanctions of various degrees upon South Africa in protest of Apartheid, with very little success. Despite this apparent show of force, no state or institution ever imposed a comprehensive ban on imports of strategic minerals from South Africa. Combined with the fact that in 1980, for example, exports of these strategic minerals represented 76% of South Africa's foreign exchange earnings,⁷ what appeared to be a show of force in retrospect looks more like a meager attempt to manipulate South African domestic policy. Indeed, the two 'sanctions' applied by the United States against South Africa during the Apartheid era resulted in an annual per capita cost of \$0.08 and \$17.19 to South Africans (Hufbauer, Schott, and Elliott 1990).

Any serious effort to use the economic ties between the two states as a political bargaining tool for the U.S. would have to involve South Africa's strategic minerals

exports. Yet, the United States never threatened to exit this most salient dimension of the economic relationship. In this section, I examine the actions of the United States with the use of the exit model to see if U.S. strategy was rational given its economic relationship with South Africa. Here I define the United States as **Ch**, and South Africa as **T**. By applying the framework of the exit model to this case, I argue that the United States was constrained from making a serious threat of exit from its core economic relationship with South Africa. The costs that the U.S. would have faced from economic exit were extraordinarily high, and global demand for strategic minerals combined with no appealing alternative suppliers meant low exit costs for South Africa. As such, the equilibrium strategy for the United States was to avoid the use of economic exit to impose its demand that South Africa end Apartheid.

Cost-Benefit Analysis

One could assume that the Civil Rights movement in the U.S. serves as evidence that the U.S. desired to see the end of Apartheid. Those who would shy away from granting the U.S. such humanitarian character need only look at the economic interests of U.S. banks and corporations that would benefit from the reduced investment risk resulting from the end of Apartheid to conclude that the end of Apartheid was in the best economic interest of the United States. Chase Manhattan Bank, for example, ceased its lending to South Africa in 1985, citing the increased risk in the investments. Two weeks later, the rand dropped twenty percent in value after Prime Minister Botha attributed domestic disturbances to “barbaric communist agitators” (Hufbauer, Schott, and Elliott 1990: 223).

Using either logic, if one assumes that the U.S. had an interest in ending Apartheid, then why did it not choose to use its superior economic weight to impose this political demand upon South Africa? Specifically, why did the U.S. continually veto UN resolutions for mandatory sanctions, and why did the U.S. never institute an embargo of South Africa's most valuable exports: strategic minerals? Figure 2 demonstrates that the trade relationship, in terms of monetary value, is skewed the way we would anticipate; the imports and exports between the U.S. and South Africa often make up roughly 20% or more of South Africa's total trade, but never more than 3% of that of the United States. As the richer and seemingly less dependent state, the U.S. should have had the ability to manipulate this economic relationship and demand that South Africa alter its domestic policy by ending Apartheid. A closer look at the economic relationship and the market structure within which it exists, however, reveals a very different picture.

[Figure 2 about here]

South Africa's economy in the post World War II era has been driven primarily by its sale of minerals to the rest of the world. It has long relied on its mineral wealth to obtain the few goods it needs to import: oil, military technology, and capital. Thus, any state that sought to use economic means to convince South Africa to end Apartheid should have targeted mineral exports. Why, then, did the U.S. never threaten to exit the economic relationship with South Africa, specifically its purchases of South Africa's minerals? Even the Comprehensive Anti-Apartheid Act of 1986 passed by the U.S. Congress (vetoed by President Reagan, but overridden by Congress) excludes strategic minerals from the list of sanctions (Hufbauer, Schott, and Elliott 1990: 227-8). The

answer lies in the actual exit costs that the United States and South Africa would face in the event of such a comprehensive economic exit.

South Africa has the world's largest known deposits of chromium, manganese, and platinum despite occupying less than 1% of the earth's land surface. Chromium and manganese are essential to the production of steel, and platinum is used as a catalytic agent to refine petroleum and reduce automobile emissions. These minerals are considered essential not only to the United States, but to Europe as well (SCUSPTSA, 1981: 310).

The strategic importance of these minerals lies in their use as well as their availability. Chromium, in the processed form of chromium ferroalloy, is needed in the production of stainless and heat-resisting steel, full-alloy steel, and superalloys (Mineral Commodity Summaries, 1973-1996). Similarly, manganese is a necessary hardening agent in the production of steel. These metals were used extensively throughout the post World War II era, as well as today, in the production of jet engines and power plant equipment. Superalloys have also been used in the pursuit of stronger, lighter defense equipment (SCUSPTSA, 1981: 311-15). Platinum's main uses have been in the automotive (catalytic converters), chemical, and petroleum-refining industries.

Three other factors establish the exit costs the United States would have endured during a comprehensive economic exit. First, alternative supplies of chromium, manganese, and platinum were hard to come by, especially during the Cold War. Figure 3 shows the world's reserves for these three minerals in 1983. Not only did South Africa possess over 77% of the reserves for these minerals; the second largest supplier was the Soviet Union.⁸ Thus, South African dominance in the minerals market generated market

imperfections that would increase the exit costs faced by the United States.

Compounding this effect was the lack of U.S. domestic capacity to produce the minerals.

[Figure 3 about here]

The reliance of the United States on imports for chromium, manganese, and platinum minerals from 1973 to 1996 appears in Figure 4. The U.S. relied on imports for at least 79% of its chromium demands throughout the post World War II period.⁹ Manganese imports represent 97-100% of U.S. consumption, and platinum imports varied from 81 to 94%. The United States (and the rest of the world) would be unable to produce enough of these minerals to satisfy its own demand in the event that the South African supply was not available. Finally, the third factor driving up exit costs for the U.S. was a lack of substitutability for these minerals. No effective substitute exists for the use of chromium and manganese in steel production, and substitute minerals for platinum in catalyst functions are still experimental (Mineral Commodity Summaries, 1973-1996).

[Figure 4 about here]

These four factors – the reliance of the U.S. on the minerals, the monopolistic power of South Africa in their supply, the inability of the U.S. to produce the minerals domestically, and the lack of substitutes – result in deep exit costs for the United States. The first factor reveals that the U.S.-South African economic relationship was much more salient to the U.S. than indicated by the overall trade data. The second factor highlights the advantage provided to the South Africans by the market structure for these strategic minerals. The last two factors suggest that the U.S. faced the problem of high asset

specificity concerning the minerals. Examining the proportion of total U.S. imports of chromium, manganese, and platinum that the U.S. imported from South Africa from 1973 to 1996 indicates that the U.S. was at its peak dependence (64% of all chromium imports) on South Africa during the mid-1980s when the Apartheid debate was center stage.

While it is impossible to know exactly where the exit cost threshold for the U.S. was during this time, it seems safe to conclude that the exit costs it faced in the event of comprehensive sanctions against South Africa exceeded this threshold.

On the other hand, as the world's leading supplier of strategic minerals, South Africa had many alternative buyers. Great Britain also imported the vast majority of its demand of these minerals and maintained substantial economic relations with South Africa throughout the Apartheid era (Anti-Apartheid Movement Report, 1986). Virtually any free world country engaged in the production of steel or products requiring the use of steel (Japan and West Germany being two of the largest consumers outside the U.S.) had to go to South Africa for the necessary chromium and manganese. This is not to say that economic exit by the U.S. would not have been costly for South Africa; however, their monopoly position in the minerals market combined with a broad demand for these minerals assured them that the exit costs imposed by the U.S. would be relatively low.

While these potential exit costs for South Africa were low, the value that the South African government placed on maintaining its domestic policies was high. The South African government denounced the idea of majority rule for the simple reason that they feared the repression it would bring upon the white minority (Hufbauer, Schott, and Elliott 1990: 233). After over four decades of repressing blacks, the white minority held considerable fears regarding retribution by a black majority in power. Based on the

combination of low exit costs and a high value associated with maintaining the status quo, it seems clear that in the event of a demand to end Apartheid and a threat of economic exit by the United States, the South African government would have been willing to bear the costs of economic exit.

Assessing the Performance of the Exit Model

Given that **Ch** in this case faced exit costs that exceeded its exit cost threshold, and **T** faced exit costs that fell below its threshold, the model predicts that **Ch** will forego its opportunity to issue a demand and threaten economic exit. The relations between the United States and South Africa throughout the 1960's, 70's, and 80's illustrate this constraint equilibrium. The U.S. repeatedly vetoed UN resolutions for mandatory sanctions against South Africa. The Johnson administration refused to form a systematic policy for South Africa (David 1982). The Carter administration had data compiled on U.S. vulnerability to mineral imports from South Africa and concluded that non-intervention was in the best interest of his economy (Beukes 1987). In 1981, President Reagan instituted a policy of 'constructive engagement' with South Africa, citing the inability of the U.S. to successfully use economic force to coerce the South African government (Hufbauer, Schott, and Elliott 1990: 221-35). Despite repeated calls for sanctions from both within the U.S. and anti-Apartheid groups around the world, the U.S. feared that economic exit would fail to bring about change in South Africa. The costs of exit for the U.S. precluded military options as well, and its only viable option was to accept the status quo.

This case also highlights a shortcoming of the model. Specifically, it reveals the difficulty one faces when trying to determine what exactly represents economic exit. After all, the U.S. did impose and maintain economic sanctions upon South Africa throughout this period. Where do we draw the line between token sanctions and economic exit? Another problem of the model is its inability to account for compromise between the two states. For example, South Africa frequently made small concessions on human rights in an attempt to satisfy U.S. demands without ending Apartheid. The model forces **T** into a simple accept–reject choice, and the empirical world is often more subtle than this dichotomy.

This case serves to illustrate how the exit model focuses on the internal tradeoffs as well as bilateral ties in economic interdependence. In a situation where traditional interdependence research would predict an asymmetrical relationship that favors the United States, a closer investigation using the exit model as a guide reveals just the opposite. I turn now to a general discussion of how the analysis of the exit model reshapes the way we should consider symmetry in interdependence and its affects on conflict.

SYMMETRY IN INTERDEPENDENCE

Barbieri (1995; 1996) has established a benchmark regarding the role of symmetry in interdependence. Recognizing that the salience of the economic relationship can vary within the dyad, symmetry in Barbieri’s research captures the relative balance of economic interdependence. At one extreme, perfect symmetry exists when both states are equally dependent upon one another. Perfect asymmetry occurs when one state is completely dependent upon its trading partner, but this partner has almost no dependence

on the first state.¹⁰ Keohane and Nye also address symmetry, arguing that it is the existence of asymmetry in economic interdependence that can be a source of economic power for the less dependent state. They are less rigorous, however, in their specification. For Barbieri, symmetry is measured as a function of *Tradeshare*

($Symmetry_{ij} = 1 - |TradeShare_{ij} - TradeShare_{ji}|$), where

$TradeShare_{ij} = DyadicTrade_{ij} / TotalTrade_i$. Her measure elegantly captures any relative imbalance within a dyadic trade relationship.

But the exit model reveals that Wagner was correct in arguing that asymmetry in interdependence, defined as unequal levels of dependence within the dyad, is insufficient to generate bargaining power for the less dependent state. **T** could have a much higher level of economic dependence than **Ch**, but if **T**'s exit costs are lower than its exit cost threshold, then the economic relationship is useless for **Ch**. Similarly, **T** could have a much lower exit cost than **Ch**, but if **T**'s exit costs exceed its threshold, it Target will yield to **Ch**'s demands. Raw exit cost levels do not provide enough information to determine whether economic interdependence will help or hinder **Ch**.

This is not to say, however, that asymmetry in interdependence is insignificant. If we consider the dyadic relationship with respect to who has exit costs exceeding their thresholds and who does not, then the concept of asymmetry has explanatory value. For example, if **Ch** faces exit costs that are below its exit cost threshold, but **T** faces exit costs that are above its threshold, there exists an asymmetry in the interdependence that is meaningful. If both states are above or below their respective thresholds, then the interdependence is symmetrical.

This generates a new interpretation of symmetry in interdependence. Symmetry with respect to each state's exit cost–exit cost threshold relationship determines the presence or absence of bargaining power. The analysis also indicates that symmetry is not always an important factor in determining the influence interdependence has on conflict. Figure 5 displays how this symmetry in the cost-threshold relationships motivates the equilibrium outcome of the game. The vertical axis represents the actual exit costs for **T**, and the horizontal axis represents the exit costs for **Ch**. Hypothetical exit cost thresholds have been inserted along these axes, and using these thresholds the two-dimensional space divided into the four possible combinations of exit costs and thresholds for both players.

[Figure 5 about here]

Quadrant I, in the bottom left corner of the graph, represents the situation when neither state faces exit costs exceeding its cost threshold. Bargaining is not effective, and **Ch** is not constrained. In the event of a dispute between **Ch** and Target, economic interdependence will not constrain the dyad from escalating to high-levels of conflict. Quadrant II, in the top left corner of the graph, represents the situation where **Ch** faces exit costs that fall below its threshold but **T**'s exit costs exceed its threshold. In this situation, **Ch** has bargaining power by manipulating **T**'s economic dependence, and low-level conflict results. The same result obtains in quadrant III, in the top right corner, where both states face exit costs exceeding their thresholds. Thus, the difference in symmetry between II and III has no effect on the outcome of the model. Symmetry is important, however, in comparing quadrant IV to III or I. In quadrant IV, in the bottom right corner of the graph, **Ch**'s exit costs exceed its threshold, but **T**'s costs do not. As

such, C_h is constrained by economic interdependence from initiating a demand that could lead to conflict. The differences in symmetry between quadrants IV and I and quadrants IV and III have an important effect on the outcome of the model.

IMPLICATIONS FOR THE INTERDEPENDENCE–CONFLICT RELATIONSHIP

With the humble understanding that this project investigates a piece of a larger puzzle, let us assess the progress made towards a working theory of economic interdependence and political conflict. The focus on exit costs and the exit option leads to a natural question about when states may be able to use this exit option for political gain and how they go about exercising this leverage. The exit model developed here is a theory of how potential exit costs can become tools of political manipulation for states to use in extracting demands from one another. By placing exit costs within the broader cost-benefit analysis of the political alternatives states face in political situations, the model demonstrates that interdependence can lead to bargaining power. It also demonstrates that economic interdependence sometimes constrains a state from making political demands, and sometimes the economic ties between two states are insufficient to constrain states from turning to the military arena to settle their disputes.

The analysis of the model reveals an interesting interaction between potential exit costs and the willingness of states to endure these costs in the event of a dispute. Both the Challenger and the Target have exit cost thresholds that limit the exit costs they are willing to bear. These thresholds are a function of the value each state associates with the issue at stake in the Challenger's demands, the costs of escalating to high-levels of conflict to resolve the dispute, and the likelihood that the outcome of such escalation will

be favorable to one state or the other. The relationship between potential exit costs and the exit cost threshold, combined with the same relationship for the other state, are what determine each state's strategy in the game.

It is this interaction –between the exit costs and the exit cost thresholds– that provides a fundamental contrast to the literature. Only by considering the exit costs of each state relative to the costs it is willing to endure do we begin to tease out a more complex understanding of *when* economic interdependence constrains states from entering into high levels of political conflict. We are now able to move away from the basic agenda of identifying the presence and direction of a relationship between economic interdependence and political conflict. The analysis of the exit model shifts our attention to the more nuanced puzzle of ascertaining when the political-economic conditions are ripe for a state to successfully employ the threat of economic exit to extract demands without the risk of militarized political conflict.

NOTES

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² See Harsanyi (1977).

³ A more detailed setup and analysis of the model can be found in Crescenzi (2003), so the game will be briefly summarized here.

⁴ This can be reactive, as in sanctions, or proactive. Not all sanctions can be considered economic exit (sanctions may be symbolic). See Crescenzi (2000) for a discussion of the concept of economic exit.

⁵ As the payoffs of this game are a function of the cost and benefit parameters, the researcher has flexibility in terms of solving for a specific parameter. My decision to focus on the exit cost parameter is driven by the substantive interests of this study, but one could just as easily center the analysis around the probability of winning a militarized conflict (p), or the value of the issue at stake (v).

⁶ For illustrations of the other two equilibrium paths, see Crescenzi (2000), chapter four.

⁷ See The Report of the Study Commission on US Policy Toward Southern Africa (1981).

⁸ Chromium reserves are in Kazakhstan, manganese reserves are in the Ukraine, and platinum can be found in Russia.

⁹ This dependence was even more severe than this statistic indicates. The U.S. imported 100% of its chromium ore consumption, but used some of this ore to produce ferrochrome for domestic use. The 79% statistic treats this domestic ferrochrome as domestic chromium consumption.

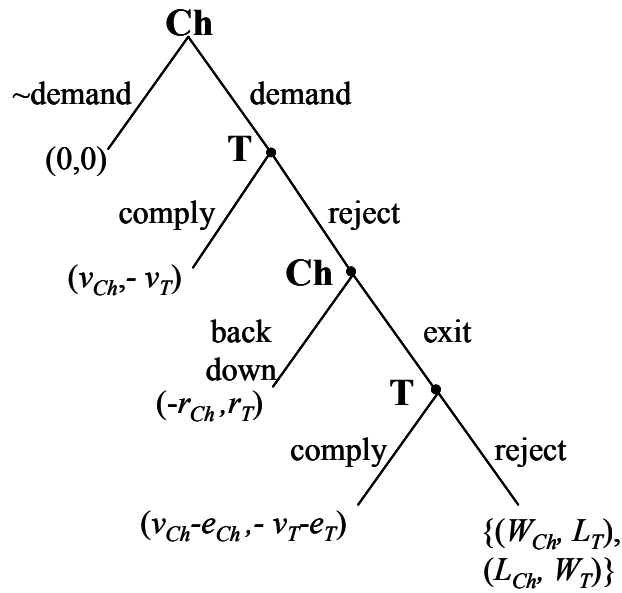
¹⁰ Because each state's dependence is a function of the sum of exports and imports between the two, if this aggregation of trade is nonzero for one state in a dyad, it is also nonzero for the other state. Thus, it is impossible for one state to be totally non-dependent on another state unless the same is true in reverse.

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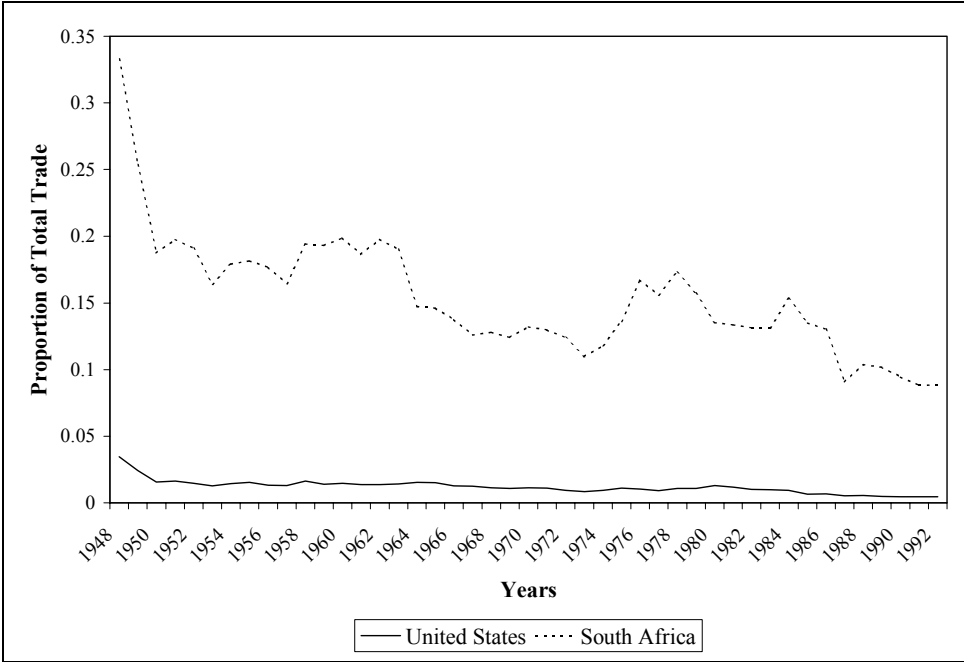
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Figure 1 A Simple Bargaining Game with Exit



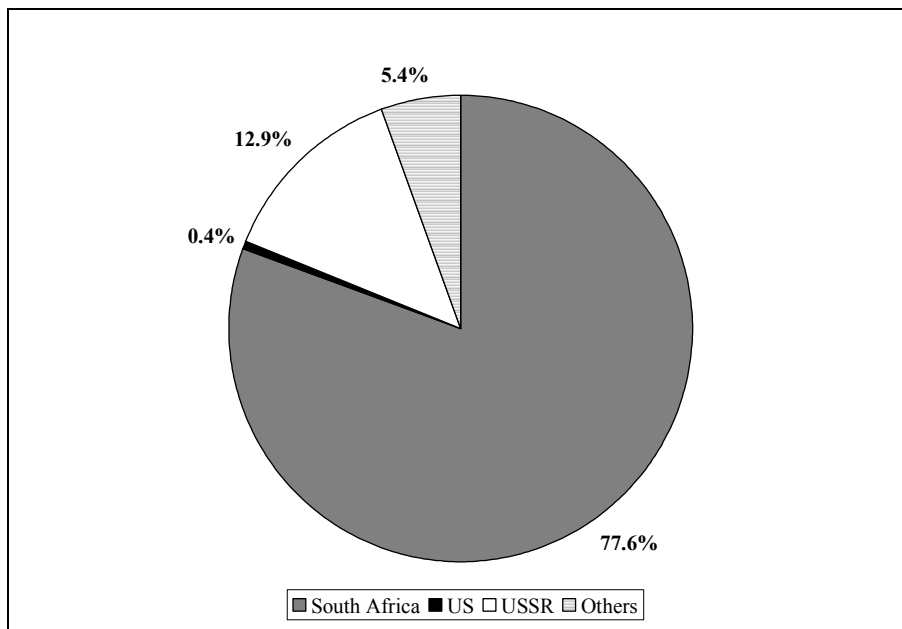
Challenger	Target
v_{Ch} = Value of Demand	v_T = Value of Demand
r_{Ch} = Audience Costs	r_T = Audience rewards
e_{Ch} = Economic Costs of Exit	e_T = Economic Costs of Exit
c_{Ch} = Costs for Conflict	c_T = Costs for Conflict
$W_{Ch} = v_{Ch} - e_{Ch} - c_{Ch}$	$W_T = -e_T - c_T$
$L_{Ch} = -e_{Ch} - c_{Ch}$	$L_T = -v_T - e_T - c_T$

Figure 2
Trade Between United States and South Africa
as a Proportion of Total Trade



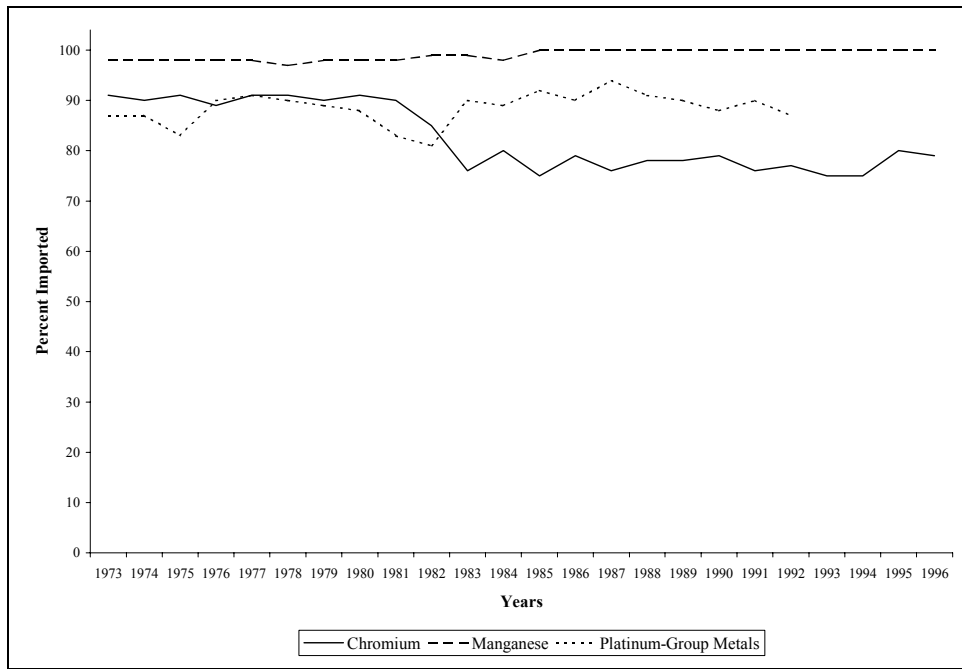
Source: (Barbieri 1999)

Figure 3
Mineral Reserves (1983) for Chromium, Manganese, and Platinum



Source: (USGS Mineral Commodity Summaries, 1973-1996).

Figure 4
U.S. Reliance on Imports of Three Key Minerals



Source: (USGS Mineral Commodity Summaries, 1973-1996).

Figure 5
Symmetry in Exit Costs and Thresholds

