

Superpower Dispute Initiation: An Empirical Model of Strategic Behavior

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Abstract

A method is presented for empirically modeling simultaneous decisions using the estimation technique of bivariate probit. This technique is used to examine the directed dispute-initiation behavior of the superpowers during the Cold War. Power-transition concepts of satisfaction and rates of capability change can be used to explain directed dispute-initiation behavior. In particular, the international influence of the rival translates into a superpower's dissatisfaction, making dispute initiation by that superpower more likely, ceteris paribus. Additionally, a rapid strengthening of the challenger, ceteris paribus, increases the likelihood of dispute initiation in either direction. Changes in the hegemon's capabilities, though consistent with power-transition theory, have no effect on dispute-initiation behavior. These effects hold even while controlling for various domestic conditions in each country.

Key words: conflict studies, strategic modeling, bivariate probit

Introduction

On December 31, 1991, the Soviet Union formally ceased to exist, thus ending the greatest rivalry in the history of world politics. Unlike Athens, Carthage, or Germany, the demise of the Soviet Union was not a consequence of war. Indeed, the Soviet Union collapsed despite eleventh-hour attempts by the United States to keep its old rival intact. Yet war was not an unexpected possibility between the

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two superpowers. Tensions waxed and waned, but war was always a consideration in Cold-War politics. Given that no war occurred, is there any logic in the pattern of conflict that did occur? I argue that the timing of disputes did not occur by happenstance but was the result of strategic interactions between the actors.

This is, by and large, an analysis of the unique relationship between the United States and the Soviet Union. The events of and policies made during the Cold War still affect international relations. Thus, the history of this relationship still has intrinsic value to scholars and policy-makers. While the current situation of “unipolarity” might seem to make such a study moot for today’s world, the “hyperpower” position of the United States will not last forever. In addition, the lessons of keeping the Cold War cold could be applied to other rivalries—such as that between India and Pakistan. The current rise of China and the relative decline of the United States has intrigued and concerned academics and policy-makers alike. Tammen et al. (2000) are particularly pessimistic about how a rising, dissatisfied China will interact with the United States. Others, perhaps most notably Chan (2008), take a more optimistic view of this relationship.

The most salient theoretical literature concerning conflict behavior at the superpower level deals with hegemonic politics. Whether focusing on hegemonic war (Gilpin 1981; 1988), long cycles of global leadership and decline (Modelski 1987; Modelski and Thompson 1989), or power transitions (Organski 1958; Organski and Kugler 1980), all of these authors agree that the rules of international politics (i.e., the international status quo) are partially crafted by the inherent power hierarchy of the system. The hegemon plays a predominant role in setting the rules given this hierarchical structure. As the most powerful member of the international system, the hegemon uses its power to shape the rules in its favor. Other countries generally adhere to these rules for two reasons. Either they are too weak to challenge the hegemon and find greater benefit in following the rules than in challenging them, or they perceive the rules to be—at least nominally—in their favor.

But the international system is not entirely hierarchical. Given the coexisting aspect of anarchy that also reflects the nature of the international system, the hegemon is never entirely secure in maintaining its most favored set of rules. Challenges can technically come from all quarters, not just from an identifiable challenger. Even those too weak to force their own set of rules can make the imposition of rules costly for the hegemon. Vietnam presents but one case in point. In addition, the hegemon cannot be assured of its continued status. By virtue and

vice of its position, the existing hegemon can be supplanted by a more powerful country. Thus, the international status quo is a function of the existing hegemon and its relations with the rest of the system.

The power-transition literature is perhaps most deeply concerned in international relations with the concept of the status quo. In what follows, I draw heavily upon power-transition theory but also depart from it in significant ways to make my own contribution. The argument here focuses more on the satisfaction (or dissatisfaction) of each actor. It also focuses on conflict far below the threshold of war. The justifications for these deviations are given below.

Kugler and Organski (1989, 73) wrote, “[d]egrees of satisfaction as well as power are critical determinants of peace and conflict.” This idea of “satisfaction” has been operationalized in a variety of ways (cf. Bueno de Mesquita 1975, 1981, 1990; Kim 1991; Werner and Kugler 1996), often as “dissatisfaction.” The peaceful transition between the United States and the United Kingdom is often attributed to the relative satisfaction between the two powers. As Organski put it (1958, 323), “the major reason why England has allowed the United States to take her place without a struggle is because the United States has accepted the Anglo-French international order. [The United States has] not upset the working rules.” (See also Lemke and Kugler 1996, 21.) But this was not the case between the Soviet Union and the United States. Clearly, the Soviet Union had its own “working rules,” but did not press for their adoption in a way that produced a major war. But there were occasions in which demands for change produced conflict short of war.

Power-transition theory is intimately concerned with great-power relationships, so it should apply to the Cold-War rivalry. The relationship between the United States and the Soviet Union is clearly a candidate dyad fitting power-transition definitions of hegemon and challenger, respectively. One wonders in retrospect whether any aspect of power-transition theory can be applied to the superpower rivalry. Specifically, can the logic of power-transition theory be used to explain lower levels of conflict in a strategic setting?

On a theoretical level, power-transition theory was originally conceived as a theory of great-power wars. As a hegemonic theory, its logic can be extended to other aspects of hegemonic relationships. This includes investigating the interactions between hegemon and challenger *even in the absence of a transition*. As we extend the logic in this direction, the connections between power-transition theory and expected-utility modeling become apparent (e.g., Kim and Morrow

1992). The main criterion for conflict within the expected-utility framework is that the expected costs of conflict—physical and political—cannot outweigh the expected benefits. Although an assumption necessary for rational-choice analysis is that preferences are fixed (Morrow 1994, 19), this assumption obviously does not hold over the long term or—necessarily—from interaction to interaction.¹

Some empirical findings in the power-transition literature implicitly make the connection between the expected-utility framework and conflict short of war. Lemke and Reed (1996) find that jointly satisfied relevant dyads rarely engage in Militarized Interstate Disputes with one another. Additionally, Geller (1992; 1996) argues that power-transition theory can be used to explain conflict initiation among major-power “contenders.” Geller finds that the dyadic power condition (i.e., unequal, equal, or overtaking) helps explain conflict initiation; the inferior power is more likely to initiate conflict during unequal periods while the superior power is more likely to initiate conflict during the equal and overtaking periods. More recently, Geller (2000) has found that the status-quo challenger in a rivalry is more likely to initiate war. All of this presents a starting point for understanding American-Soviet relations during the Cold War. Hebron et al. (2007) apply power-transition theory and power-cycle theory to both militarized disputes (MIDs) and international crisis behavior (ICB) data; they find some support for these power theories but suggest that further work be done.² Finally, Lemke (2008) applies power-transition theory to the struggle for state-building among state and non-state actors in South America. Clearly, power-transition theory has applicability beyond major war.

I also address the problem of modeling strategic behavior empirically. This problem came to the fore with Signorino (1999) and Smith (1999) taking the lead in offering their own solutions within the international-conflict literature. Signorino presents a technique in which a sequential game’s parameters can be estimated empirically. Smith examines escalation by incorporating Bayes factoring into an ordered probit model as a link between game concepts and the empirical model. Neither of these techniques provides a complete solution to the problem of modeling strategic behavior empirically. In particular, simultaneous decisions cannot be estimated empirically by Signorino’s sequential setup. I present an empirical model that covers another special case of modeling strategic behavior empirically: binary simultaneous decisions.

Theoretical discussion

Power-transition theory has traditionally been applied to the likelihood of war between a dominant power and a challenger. The two criteria for a power-transition war are the power transition itself and the dissatisfaction of one of the rivals—usually the challenger. These two conditions lead Organski (1958, 325) to the conclusion that “wars occur when a great power in a secondary position challenges the top nation and its allies for control.”

Organski alluded to lesser forms of conflict in attempting to identify potential challengers. Thus he wrote (1958, 328), “[w]hen nations are dissatisfied and at the same time powerful enough to possess the means of doing something about their dissatisfaction, trouble can be expected.” This very general statement was refined by Kugler and Organski (1989, 175) in which they write, “[a]s a dissatisfied great nation approaches parity by growing in power more rapidly than the dominant nation, instability increases and so does the probability of conflict.” Within the context of superpower relations, the *expectation* of a power transition in the near future may have an effect on the likelihood of dispute initiation short of war. The expectation of a power transition is based on the growth rates of rivals:

The power-transition model postulates that the speed with which modernization occurs in big countries is also quite important in disturbing the equilibrium that existed theretofore. For if development is slow, the problems arising from one nation’s catching up with the dominant one may have a greater chance of being resolved. On the other hand, if growth takes place rapidly, both parties will be unprepared for the resulting shift. (Organski and Kugler 1980, 21)

This argument emphasizes rates of change in addition to power transitions themselves. This is also consistent with the power-cycle concept of a “critical point interval” as a predictor of dispute participation (cf. Spiezio 1993). In examining wars between major powers, Organski and Kugler (1980, 59) observed such wars only *after* a power transition. Linking their own work to power-transition theory but examining any war exceeding the one thousand battle-death threshold, Bueno de Mesquita and Lalman (1992, 205) found the probability of such wars to be highest when the initiator perceives its capabilities to be greater than half. Both of these findings take as given an already initiated dispute.

But wars do not simply occur in a vacuum. Rather, war is one end result of an escalatory process.³ Escalation in this process begins with some crisis or dispute. The

decision to begin a crisis rather than negotiating in good faith has been tied to the expectation of gain through coercion (Schelling 1966). It is through this link of escalation that the logic of power transition can help explain lower levels of conflict.

Following Geller (1992), I assume that the power-transition variables are associated with both dispute initiation and war. The challenger would expect to gain more in a dispute if its recent growth rate were high. In the short term, the challenger is more powerful than it has been in the past. In the long term, if the high growth rate can be maintained, the challenger could be expected to overtake and supplant the hegemon. Thus, the challenger might expect the acquiescence of the hegemon. At the same time, relative satisfaction would temper the challenger's dispute-initiation behavior. Dispute initiation always carries with it the risk of war. A relatively satisfied challenger with a high growth rate might be inclined to wait for tacit acquiescence rather than risk war in hopes of a forced acquiescence; therefore, a satisfied challenger is less likely to initiate a dispute. I add to this three other elements. First, I focus on year-to-year interactions within the one-superpower dyad. This allows me to examine subtle changes and their effects on dispute initiation. Second, I incorporate domestic-level data that have proved useful in other studies. These variables help explain the dispute initiation behavior that starts or prevents the escalatory process. Third, I use an empirical model that allows me to examine the degree to which the decisions of each actor are contingent on the decisions of the other actor.

Model and hypotheses

Examining dispute-initiation behavior requires incidents of initiation as well as non-initiation. The argument above stresses that dispute initiation is a decision made by one country directed at another. Thus, there are two decision streams over time *and* the decisions may be contingent upon one another. The method presented here stresses contingency of decisions. For example, when the Soviet leadership was considering whether to initiate a dispute against the United States, they were simultaneously influenced by their underlying gain/loss calculations as well as the likelihood that the United States would initiate a dispute against the Soviet Union. This potential contingency in the decision-making within each country can be modeled to estimate *jointly* the effects of the independent variables on *both* dependent variables.

Dependent variables

Each dependent variable is a binary variable representing a dispute between superpowers during a given year with the *directional* dyad-year as the basic unit of analysis.⁴ These data are derived from the Militarized Interstate Dispute data set (Gochman and Maoz 1984; Jones, Bremer, and Singer 1996). Only the initiation of disputes is considered in this examination, coding the originator on Side A as the initiator (thus excluding joining). This operationalization is consistent with existing usage in the literature (cf. Maoz 1982; Leeds and Davis 1997).

There were fifteen dispute episodes initiated by the United States against the Soviet Union. Eleven of these episodes were initiated solely by the United States. None of the disputes extended from one year to another. The average duration of these disputes was 52 days. Two disputes were initiated in 1967 and again in 1980. Thus, thirteen years are coded as American dispute initiation against the Soviet Union.

Table I. Years coded as dispute initiation

| USA vs. USSR | USSR vs. USA |
|-----------------|-----------------|
| 1960 | 1948 |
| 1961 | 1949 |
| 1962 | 1958 |
| 1964 | 1959 |
| 1965 | 1961 |
| 1967 | 1963 |
| 1970 | 1964 |
| 1972 | 1966 |
| 1977 | 1967 |
| 1980 | 1968 |
| 1981 | 1970 |
| 1985 | 1978 |
| 1986 | 1979 |
| | 1982 |
| | 1983 |
| | 1984 |
| | 1986 |

There were twenty dispute episodes initiated by the Soviet Union against the United States. Eighteen of these episodes were initiated solely by the Soviet Union. The average duration of these disputes was 58 days. Four of the disputes extended from one year to another (but never into yet another year). Two disputes were initiated in the years 1963, 1964, and 1979; three disputes were initiated in 1958. Thus, seventeen years are coded as Soviet dispute initiation against the United States. Table I lists the years of dispute initiation.

Model

The dependent variables as operationalized are dichotomous but the underlying assumption is that there is an unobservable, continuous variable associated with the probability of dispute initiation. This assumption is captured in the following empirical model in which y_{it} are the observed dependent variables and y_{it}^* are the unobservable continuous dependent variables.

$$\begin{aligned} y_{1t}^* &= X_{1t}\beta_1 + \varepsilon_{1t} \\ y_{2t}^* &= X_{2t}\beta_2 + \varepsilon_{2t} \end{aligned} \quad \text{where } y_{it} = \begin{cases} 1 & \text{if } y_{it}^* > 0 \\ 0 & \text{if } y_{it}^* \leq 0 \end{cases} \quad i = 1, 2$$

Given the arguments from the previous section, X_{it} has the following general form:

$$X_{it} = \{\text{Satisfaction, Rates of capability change, Domestic politics}\}$$

The errors, ε_{1t} and ε_{2t} , are assumed to be identically distributed according to a standard bivariate normal distribution with correlation ρ . The subscript t indicates the time period of the observation.

Estimation of separate equations is possible but carries with it two risks. At a minimum, the coefficients of two separate models will be inefficient. At worst, the coefficients will tell the wrong substantive story. Additionally, estimating separate models when there is potential for interdependence of choice assumes that the underlying framework is decision-theoretic rather than strategic. Specifically, an *individual* binary-choice model would assume that the actor is making decisions without taking into account the likely response of the rival. By contrast, a *joint* binary-choice model takes this additional information into account. The empirical model above manages all three of these problems.

Correlated errors, contingent decisions

The model above has a correlation *coefficient* (ρ) between the errors of the two equations. The implicit assumption when running separate analyses is that $\rho = 0$. A joint binary-choice model allows us to test this assumption rather than assuming it. Thus, ρ can be considered an additional variable. Excluding ρ (by conducting separate analyses) has the same potential problems as omitted-variable bias (cf. Yatchew and Griliches 1985).

In the present study, ρ can be used to assess the whether there was some kind of contingent decision-making between the superpowers. If ρ is positive, then the Cold War rivals may have been tacitly making decisions in the same direction (e.g., not to initiate disputes against one another in any given time period). If ρ is negative, the superpowers may have been acting in generally opposite directions (e.g., being less likely to initiate a dispute when the other side has a higher expectation of initiating a dispute). If ρ is indistinguishable from zero, then no clear contingency can be inferred and independent logit analyses would give us the same substantive findings. A final important point regarding ρ is that it is *not* the correlation between the dependent variables but is the correlation *coefficient* between the *errors* of two equations in a simultaneous model. Thus, we could observe a pairwise correlation of zero between the dependent variables and still have a ρ that is *not* zero. This would suggest that contingency of decision-making may be obscured when directly examining the data but can be recovered through appropriate modeling techniques. The possibility of correlated errors and contingent decisions presents the first hypothesis:

H1: There is contingency of decision-making.

As with any hypothesis concerning the structure of the errors, a number of caveats apply. The most important is that there are an unlimited number of omitted variables that are subsumed in the errors and, therefore, in Thus, I present this hypothesis as *strictly conditional*. If there is strategic behavior underlying the decisions, I expect to see a non-zero ρ .⁵

Dissatisfaction and influence

Dissatisfaction should increase the likelihood of dispute initiation. A country's dissatisfaction within the dyad is conceived of as the inverse of its rival's international influence. Thus, a country's dissatisfaction is an assessment of relative satisfaction within the dyad. The international influence of one's rival

should *increase* the likelihood of one's own dispute initiation against that rival. A great deal of debate has centered on the conceptualization and measurement of dissatisfaction. In the exchange between Lemke and Reed (1998) and Oneal, de Soysa, and Park (1998), the problem of separating power from satisfaction is made clear. Power is both a marker of a country's position in the international hierarchy *and* a means to restructure relationships with less powerful countries for greater benefit. A common criticism of Organski (1958) is that the two concepts were conflated. Kim's (1991) use of alliance-portfolio similarities with the hegemon was the first solid attempt to separate the concepts empirically. Even within this measure the hegemon is deemed as perfectly satisfied. I attempt to separate the concepts using a conceptualization of satisfaction that (1) is not *directly* related to power, (2) allows for variation in measurement for *both* challenger and hegemon, and (3) makes sense within the context of the Cold-War rivalry.

A superpower's dissatisfaction with the status quo is presumed to be linked to the international influence of its rival *to the extent that the two superpowers are rivals for international influence*. The hypothesis associated with dissatisfaction is:

H2: The international influence of the rival is positively related to a superpower's likelihood of initiating a dispute against its rival, *ceteris paribus*.

Rates of capability change

Rates of capability change reflect the speed-of-modernization argument made in Organski and Kugler (1980, 21). This argument can be applied without an actual power transition. When the challenger experiences rapid growth—or a large increase in capabilities—both sides are thrown off balance. This then increases the likelihood of dispute initiation. I also examine whether increases in the hegemon's capabilities has the intuitively converse effect of decreasing the likelihood of dispute initiation.

The power-transition framework—in the broader literature—places greater emphasis on the growth rate of the challenger than on the decline of the hegemon. In particular, Organski and Kugler stated, “if growth takes place rapidly, *both* parties will be unprepared for the resulting shift.” (1980, 21 emphasis added.) Given this argument, a sharp rise in Soviet capabilities is expected to produce more dispute initiation by *both* countries. Increases in challenger capabilities make the challenger more likely to press its short-term advantage while the same condition makes the hegemon more likely to attempt to keep the challenger at bay. Decreases in challenger capabilities make the challenger less of a threat to the

hegemon and removes any short-term advantage the challenger may have had. This result is expected to be monotonic with respect to dispute-initiation propensity. Large increases in challenger capabilities make both countries much more likely to initiate disputes compared to small increases.

H3: Increases in the challenger's capabilities are *positively* related to dispute initiation within a dyad, *ceteris paribus*.

A decrease in hegemon capabilities also gives the challenger a short-term advantage similar to the advantage it gets from an increase in its own capabilities. A decrease in hegemon capabilities could also make the hegemon desperate to hold onto its position. This is consistent with Organski's (1958) original argument, but greater emphasis and empirical research has been given to a rising challenger. In the Cold War context, as the United States declined or the Soviet Union grew stronger (each relative to the rest of the world), a power transition became more likely and—by implication—so did dispute initiation. Thus,

H4: Increases in the hegemon's capabilities are *negatively* related to dispute initiation within a dyad, *ceteris paribus*.

Taken by themselves, these hypotheses are only dyadic in nature (i.e., not *directed* dyadic). In principle, a change in capabilities may only push one actor over the threshold for dispute initiation depending on the values of the other variables at the time.

Domestic politics

The domestic environment component of X_{it} reflects control variables that either have been useful in past studies or present conceivable proxies for different domestic circumstances. The democratic nature of the United States provides a number of potential domestic explanatory factors. Two prominent political factors are the election cycle and national party politics. For the non-democratic Soviet Union, there are relatively few domestic variables that can be used consistently throughout the entire period under examination. Leadership periods, however, are proxies for different domestic environments.

Following Ostrom and Job (1986), I examine whether presidential election years are more or less likely to elicit dispute initiation by the United States. In addition, to the extent that the American election cycle affects the behavior of other countries, I would expect other countries to be less likely to engage in

dispute initiation against the United States during a presidential election year. The rationale behind this expectation is that negative action taken against the United States during an election year is more likely to engender an electorate hostile toward the action taker. The hostile electorate would then be more likely to select candidates that hold national-security interests antithetical to the initiating country. This expectation might be stronger for presidential election years since there is more at stake in terms of a foreign-policy shift.

H5: Presidential election years are *positively* related to American dispute initiation against the Soviet Union and *negatively* related to Soviet dispute initiation against the United States, *ceteris paribus*.

Party politics is another possible explanatory factor in dispute behavior involving the United States. The party of the president has been shown to be an indicator of general American foreign-policy stances (Holsti 1996). It is also possible that the party of the president serves as a signal of likely American responses to the actions of other countries. Specifically, Republicans are generally conceived as hawks while Democrats are generally conceived as doves (see also Fordham 1998). This has been considered to mean that the United States is more likely to get involved in disputes under Republican presidents.

H6: The presence of a Republican president is *negatively* related to Soviet dispute initiation against the United States, *ceteris paribus*.

Another party-based explanatory factor is the composition of Congress in relation to the party of the president. If the president faces a Congress in which the opposite party controls one or both chambers, it is more difficult for the president to get the (tacit) approval necessary for military action. This is part of the “structural explanation” for the democratic peace that is the focus of Palmer and Regan’s parliamentary work. This explanation “would lead one to expect that more complex coalitions should engage in less (or less serious) conflict than simpler governments” (Palmer and Regan 1999, 3). In the context of the United States, the “complex coalition” is a divided government. By the institutional reasoning above, it is expected that this variable be negatively related to dispute initiation by the United States against any other country.

H7: The existence of a divided government in the United States is negatively related to American dispute initiation against the Soviet Union, *ceteris paribus*.

Theoretically, Soviet leadership periods are conceived of here as proxies for different domestic environments. They could also reflect different leadership styles similar to the hawk-dove distinction of Republicans and Democrats. Additionally, they could represent different eras within Cold War history. Given these competing interpretations, it is difficult to point to clear predictions that are not historically informed. As the best available and most consistent indicators, however, it would be unwise not to examine the effects of Soviet leadership on dispute-initiation behavior within the dyad.

Measurement issues

International influence of the rival

As argued earlier, a country's dissatisfaction within the dyad is assumed to be directly related to its rival's international influence. In addition, a country's influence is hypothesized to have an independent effect on its own decision-making. Rather than assume that the United States (as hegemon) was always completely satisfied, I set out to measure the satisfaction of *both* the challenger and the hegemon. This assumption of relative satisfaction of the hegemon is supported by Lemke and Reed (1998, 513) where they argue that:

Power transition theory does not assume, argue, or suggest that the power a nation obtains or enjoys predetermines its evaluation of the status quo. According to power transition theory, there is no consistent relationship between power and status quo evaluations.

I use ambassadorial representation as a measure of a country's international influence. The additional benefit of using ambassadorial representation—as measured here—is that it is largely out of the hands to the actors under investigation. Thus, it is much closer to being an exogenous, environmental proxy for influence.

Diplomatic relations between countries are formally conducted through missions accredited to a country's capital. Foreign embassies in Washington and Moscow, for example, represent much of the formal diplomatic relations directed toward the United States and the Soviet Union from other countries in the world. By convention dating back to the end of the Napoleonic Wars, diplomats with the title of "ambassador" are the highest rank of diplomat; a diplomatic mission can

only have one ambassador. However, a diplomatic mission may not include an ambassador and may instead be headed by a lower-ranked diplomat. Ambassadors are generally political appointees while lower-ranked diplomats are generally civil servants.

No country has an embassy in *every* other country in the world; most countries have to be selective about where to have embassies due to the cost of maintaining a physical presence in another country. Similarly, heading an embassy with an ambassador has additional costs above simply letting civil servants run the mission. I assume that countries decide where to send ambassadors on the basis of the importance of their relationship with a potential receiving country (either by way of trade, foreign aid, or international politics generally). Thus, countries that are ranked as more important by more countries tend to have more ambassadors than less important, less influential countries.

Other researchers have keyed in on this aspect of international influence. The most prominent of these studies is Wallace (1972) in which he used Singer and Small's (1966) data on the number of diplomatic missions accredited to a country's capital. Unfortunately, the use of the number of diplomatic missions or of embassies is not very sensitive to smaller changes over time. Changes in personnel are more frequent than the drastic decisions to cut formal diplomatic relations altogether. For example, an ambassador can be recalled for a number of reasons, the most significant of which is a signal of displeasure to the government of the receiving country. Thus, a measure based on ambassadors rather than embassies has greater sensitivity.

I measure the influence of country i in year t as the number of foreign embassies in country i headed by ambassadors (A_{it}) controlling for the number of countries in the world (N_t)—that is, $(A_{it})/(N_t - 1)$.⁶ This creates a percentage measure of how many countries in the world are sending ambassadors to the United States and, separately, to the Soviet Union. The concept of influence is consistent with the concept of dyadic dissatisfaction within the context of the Cold-War rivalry. The very nature of the rivalry itself was a contest to see who could gain more influence over the bulk of countries in the international system. Thus, the influence of the rival is a measure of dissatisfaction within the contest of the Cold War.

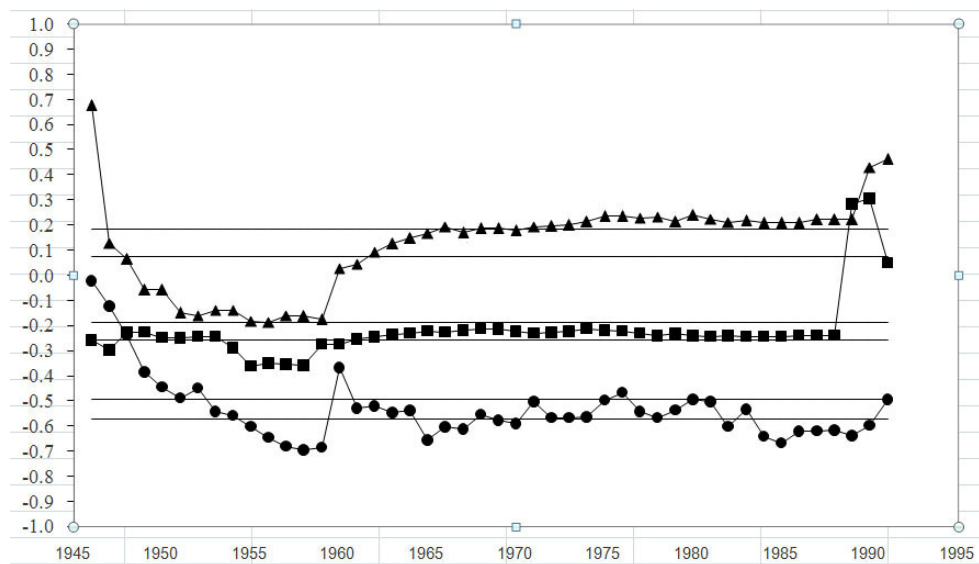
The main alternative measures for satisfaction to the one proposed above are based on Kim (1991). Kim suggested that the satisfaction of a country be measured by the similarity of its alliances compared to those of the "system

leader". This has been done using Bueno de Mesquita's (1979) τ_B measure and Signorino and Ritter's (1999) S-score of alliance portfolio similarity. For the time period analyzed in this study, the system leader is the United States.

One immediate drawback of these measures for the present study is that they are identical to unity for the United States and present no variation. Thus, the United States is deemed to be satisfied for the entire period *because of its presumed role as system leader*. Presuming instead that the United States marks its satisfaction against Soviet ambassadorial representation (as part of the Cold-War context) creates variation and allows for the United States to be relatively dissatisfied for periods of time.

On the Soviet side, the three measures are competitors. Figure 1 plots them against one another with American ambassadorial representation converted to match the logic of the alliance similarity measures.⁷ The 95% confidence intervals of each measure (within the sample) are also included to systematically compare the variability of each measure.

Figure 1. Comparison of satisfaction measures



All three measures show an initial high point for 1946. The S-score actually registers high initial satisfaction while the other two show mild dissatisfaction. All three measures then show a decline in satisfaction. For τ_B , the initial decline is

brief, stabilizes, and then continues to decline from 1955 to 1959. For ambassadorial representation and the S-score, the basic pattern of decline continues right through to 1959. All three register lower than average satisfaction from 1955 to 1959.

There is a spike in satisfaction from 1959 to 1960 that is picked up by all three measures. This is attributable to the increase in the number of sovereign countries in 1960 resulting from decolonization in Africa.⁸

From 1960 onwards, all three measures diverge from one another. Tau_B shows consistently average scores until 1990. The S-score shows a steady increase with a similar spike in 1990. Note also that the S-score registers the Soviet Union as mildly satisfied for this whole last thirty years of the Cold War. The ambassadorial representation measure picks up greater variation than either alliance similarity measure, sometimes below average and sometimes above average (though always in the “dissatisfied” range). All three also register an-end-of-period spike in 1991. The spikes in the three measures here are attributable to another large increase in the number of sovereign countries with a similar effect as in 1960.

Applicability and Limits of the Ambassadorial representation Measure

I am not suggesting that Kim’s measure is without merit. Within the Cold War context, however, we have the sense that the rivalry was as much about diplomacy as it was about security arrangements (if not more so). Focusing on alliances only captures one aspect of diplomatic activity. The comparison above suggests that the two types of diplomatic activity roughly correlated from 1946 to 1960. After the foundations of the Cold War alliance system were established, this area of diplomatic activity only changed at the margins while other diplomatic struggles continued. Additionally, ambassadorial representation allows us to examine the satisfaction of the hegemon as a variable rather than assuming that it was satisfied (and highly so) for the whole period.

Ambassadorial representation also has its limits as a general measure of satisfaction. First, it is not easy to collect before 1966. Second, it presumes a diplomatic struggle that may not exist in most rivalries. As an example, China may be more concerned with Taiwan’s ambassadorial representation than with that of the United States.

Rates of capability change

A hypothesis testing whether *rates of change* affects dispute-initiation behavior should reflect that *expectation* rather than *parity*. This emphasizes that parity itself is not the most important factor underlying dispute-initiation behavior. Instead, it is the expectation that parity *could be achieved sooner rather than later* that is most important (Organski and Kugler 1980, 21). This is also in keeping with power-cycle's focus on the "critical point interval" during which conflict is more likely (cf. Spiezio 1993). This hypothesis can be tested using Singer, Bremer, and Stuckey's (1972) Capability Composite Index to examine a country's proportion of global *capabilities*. This is an index measure from the Correlates of War Project that is an unweighted average of six system proportions: military expenditures, military personnel, energy consumption, iron and steel production, urban population, and total population.⁹ Changes in capabilities from year to year for each country are used to assess the rates-of-change argument.¹⁰

Although power-transition theorists have focused on economic power—mainly Gross National Product (starting with Organski and Kugler 1980), there are a number of problems with this focus given the particulars of the Cold War. The most fundamental problem is that the basis of each economy (i.e., open-market versus command economy) makes comparisons of the usual economic indicators virtually meaningless. Additionally, while more accurate measures of these indicators (and others) are becoming available with the opening of Soviet archives, it was the *perception* of power shifts that would have been important to contemporary decision-makers. It is apparent, for example, that both sides believed that a transition was possible—if not likely—and that the Soviets were pushing their economy to produce such a transition.¹¹ Finally, there was a certain tunnel vision concerning the health of the Soviet Union beyond its military might. As Gaddis puts it, "both sides had tacitly agreed to calculate their strengths in the particular category of power... in which the Soviet Union could still match the United States" (Gaddis 1997, 292). Given these factors, the Correlates of War measure of capabilities seems more appropriate than the traditional power-transition focus on strict economic power.

Domestic variables

The American domestic variables focus on the election cycle and national party politics. I coded a dummy variable for *presidential election* years that takes the value one in a presidential election year and zero otherwise. I coded another

dummy variable for *Republican president* that takes the value one when for years in which there is a Republican president and zero for Democratic presidents. Finally, I coded a dummy variable for *divided government* that takes on the value one if the party of the president does not control both chambers of Congress.

A methodological problem arises when trying to use *Republican president* and *divided government* in the same equation. The pairwise correlation between these two variables is very high (0.8333). Including both in one equation produces a near-colinearity problem (cf. Greene 1993). Theoretically, it makes sense to think about the president influencing Soviet behavior toward the United States while divided (or unified) government influences American behavior toward the Soviet Union. This simply implies that the Soviets concentrated on American leadership while the Americans were concerned with potential domestic problems.

Gaddis (1987, 16) emphasizes the Soviet part of this argument:

There was here a tendency, repeated more than once in the subsequent history of Soviet-American relations, for Moscow to attribute too much power to the president of the United States, and to neglect the domestic constraints under which he operates.

Thus, I use *Republican president* (but not *divided government*) when analyzing Soviet dispute initiation and use *divided government* (but not *Republican president*) when analyzing American dispute initiation. This takes care of a methodological malady by using a theoretical thesis and a historical hint.¹²

For the Soviet Union, I simply use dummy variables for individual leadership periods, coding the head of the Communist party as the leader. For each leader, I coded whether he was the head of the Communist party for a given year. As a matter of measurement, I required the leader to be in power for one-half year or more; otherwise, that leader-year was coded as a zero.¹³ No particular *ex ante* expectation is made for any of these leadership variables. Not considering them, however, could produce incorrect inferences if personal leadership is driving international relations.

One final methodological problem must be noted before moving on to the estimation section. The leadership variables *Stalin*, *Andropov*, and *Chernenko* produce perfect predictions with American dispute initiation. Including these variables makes the estimation highly inefficient. As an additional result, including all three other Soviet leadership variables in the estimation of American dispute initiation produces similar problems. As a partial remedy for this, I only

included *Khrushchev* and *Brezhnev* in that part of the analysis. On the Soviet side of the analysis, I only included *Gorbachev* for similar reasons.¹⁴

Results

Bivariate probit is the appropriate technique to estimate the empirical model.¹⁵ This estimation technique has most often been used in political science as a selection-effects model (cf. Berinsky 1999; Hojnacki 1997, 77n; Senese 1997; Reed 2000). When using bivariate probit to test for selection effects in escalation, for example, the unit of analysis is the non-directional dyad-year (e.g., Reed 2000). The selection question (i.e., the first dependent variable) is whether the two countries will get involved in a dispute with one another—regardless of who initiates the dispute. The escalation question (i.e., the second dependent variable) is whether two countries that *have become involved in a dispute* will escalate to violence or war. If a dyad does not become involved in a dispute in the first place, they do not show up in the analysis of the escalation question; they are censored. This is a reasonable way to examine the escalation of disputes since, theoretically, we would not expect escalation within a dyad that has not experienced onset.

The use of bivariate probit here differs from these earlier efforts. The onset question itself can be broken down into a simple strategic decision problem between the two countries that comprise the dyad. Each has a decision to initiate or not in each period of time; the decision by each country may or may not be predicated on the decision of the other. Bivariate probit is used here to capture some of this strategic decision analysis; hence, there are no censored values on either dependent variable in the present empirical analysis. This is not the first study to use bivariate probit in this way. Huffman and Lange (1989) used bivariate probit to examine the off-farm work choices of farming spouses. Huth and Allee (2002) used bivariate probit to examine concession making during rounds of negotiations. For both of these analyses—like mine—interdependent actors were modeled as making *individual* decisions (to seek wage employment or not; to make territorial concessions or not) in which the decision of one actor affected the other actor's decision.

The results of the bivariate estimation are reported in Table 2. The model correctly predicts 76.1% of American and 69.6% of Soviet dispute-initiation behavior. This corresponds to reductions in error of 6.1% and 10.3%,

respectively.¹⁶ The likelihood ratio index (LRI) for the model is 0.3507.¹⁷ The results support two of the three power-transition hypotheses. The results also support the hypothesis that there was contingency of decision-making.

Table II. Seemingly unrelated bivariate probit results

| | USA vs. USSR | | USSR vs. USA | |
|------------------------------------|------------------------------------|-----------------|----------------------------|-------|
| | Coefficient (Robust SE) | p | Coefficient (Robust SE) | p |
| American Influence | | | 22.38 (6.28) | 0.000 |
| Soviet Influence | 18.61 (6.75) | 0.006 | | |
| Change in American Capabilities | 10.17 (35.44) | 0.774 | -3.17 (21.12) | 0.881 |
| Change in Soviet Capabilities | 159.99 (48.69) | 0.001 | 129.24 (48.63) | 0.008 |
| Presidential Election Year | 0.67 (0.59) | 0.247 | 0.54 (0.52) | 0.307 |
| Divided Government | -0.88 (0.49) | 0.072 | | |
| Republican President | | | -1.61 (0.48) | 0.001 |
| Khrushchev | 3.33 (1.22) | 0.006 | | |
| Brezhnev | 1.01 (0.64) | 0.114 | | |
| Gorbachev | | | -1.22 (0.65) | 0.061 |
| Constant | -12.36 (4.49) | 0.006 | -16.93 (4.84) | 0.000 |
| ρ | | -0.66 (0.22) | | |
| N = 46 | LRI = 0.3507 | | | |
| LL = -37.950 | ROE% of American Initiation = 6.1% | | | |
| Wald $\chi^2(13) = 36.68$ | ROE% of Soviet Initiation = 10.3% | | | |
| $P > \chi^2 = 0.0005$ | | | | |

There is strong support that the international influence of a country's rival increases the likelihood of that country initiating a dispute against its rival. Soviet influence had a positive and significant effect on American dispute initiation, and

American influence had a positive and significant effect on Soviet dispute initiation. Thus, H2 finds support in the data. There is also strong support for the rates-of-change hypothesis. Increases in Soviet capabilities (as the challenger) had a positive and significant effect on *both* American and Soviet dispute propensities. Thus, H3 also finds support in the data. These results support the argument that the core power-transition concepts of dissatisfaction and rates-of-capability change can be used to explain conflict behavior short of war. The finding that dissatisfaction is a positive indicator of dispute initiation is consistent with power-transition theory. The strong mirror relationship in which one's rival's international influence pushes a country closer to dispute initiation validates the assertion that this variable is measuring dyadic dissatisfaction. The observed mirror relationship also suggests that the relative satisfaction of the hegemon may be more important than previously believed.

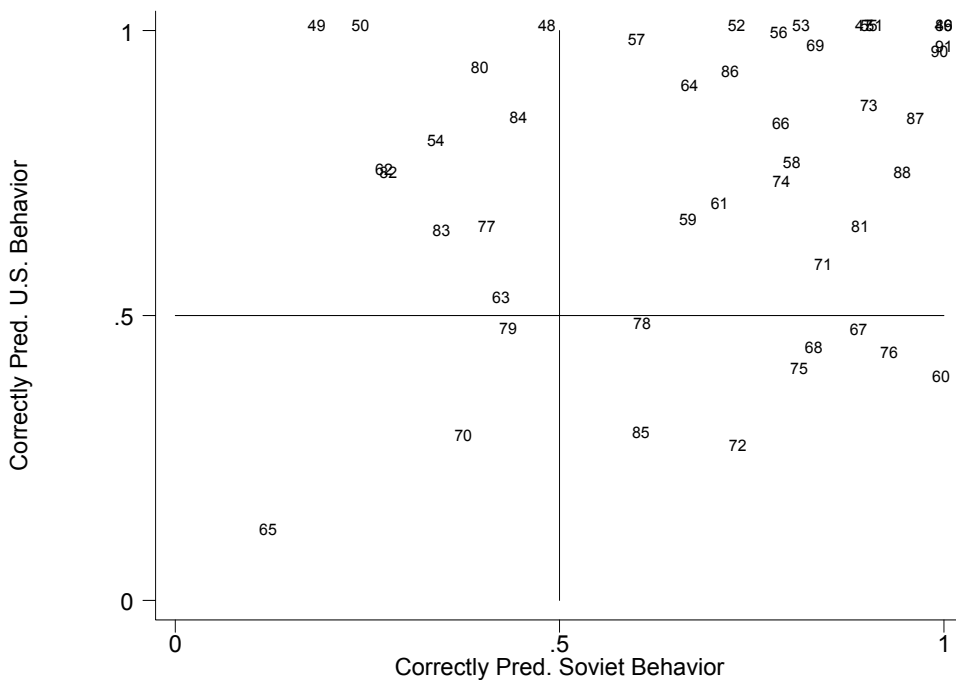
H4 must be rejected. Changes in American capabilities had no significant effect on either American or Soviet dispute propensities. Recall that this hypothesis is consistent with power-transition arguments but greater emphasis has previously been given to examining the effects of a rising challenger rather than testing the effects of a declining hegemon. Although H4 is an implication following the logic of H3 and statements by Organski, there is an expectation among all parties that the dominant power will eventually decline. This is clearly present—in capability terms—in the Cold War context. Since this expectation is common knowledge, the general decline of American capabilities should not be expected to cause unexpected behavior. Rather, it is the unexpected bursts of Soviet capabilities that put both sides off balance and produce more conflictual behavior. This is an important null finding, however, since it was a previously untested but logical implication of power-transition theory.

The correlation coefficient clearly indicates a negative relationship between the errors in the two equations supporting H1. A Wald test on the hypothesis $\rho = 0$ also rejects the notion that the choices are being made independently ($\chi^2(1) = 3.97$, $P > \chi^2 = 0.046$). This is despite the fact that the pairwise correlation between the two dependent variables is only 0.0196. As suggested earlier, we do not directly observe the contingent behavior of the superpowers. But the results seem to indicate that when one superpower was *likely* to initiate a dispute (whether or not it did), the other superpower was simultaneously *less* likely to do so.

This finding by itself can be interpreted in a number of ways, each with caution. It could indicate an awareness, for example, that restraint was perceived

as necessary within the relationship. This feeling of restraint is consistent with Gaddis’s (1987, 1997) historical arguments regarding the nuclear aspect of the rivalry. It is also consistent with Vasquez’s (1996) argument that non-territorial rivalries—like that between the United States and the Soviet Union—require third-party contagion in order to escalate to war. The negative correlation could also indicate that initiator advantage was often one sided. If circumstances favored one side in a given year *and* the other side realized this, then the advantaged side would be more likely to initiate while the other would be less likely to do so. Regardless of the underlying mechanism, the decisions of the actors were contingent upon one another. Figure 2 plots the probability of *correct prediction* for the two dependent variables as estimated from the bivariate probit (with each data point denoted by its two-digit year).¹⁸ From this figure we see that the model made incorrect predictions *on both* dependent variables in only three cases.¹⁹ We also see that there were a number of instances in which the model correctly predicted the behavior of one country but not the other.

Figure 2. Scatterplot of correct prediction probabilities



The American domestic control variables also exhibited most of the predicted effects. Presidential election year had a positive but moderate effect on American dispute initiation. This finding is consistent with the results in Ostrom and Job (1986, 555). The same variable had no significant effect on Soviet dispute initiation. Divided government exhibited the expected negative effect on American dispute initiation. Likewise, Republican presidents reduced the propensity of the Soviet Union initiating disputes against the United States.

Conclusion

The preceding results lend support to the two hypotheses that were most closely derived from the logic of power-transition theory. The same results rejected the hypothesis that was previously untested but a logical derivative of the theory. This suggests that the main arguments of power-transition theory—and hegemonic theories generally—can be usefully applied to lower levels of conflict between a hegemon and its principal challenger. Specifically, the international influence of one's rival translated into one's own dissatisfaction. This dissatisfaction then increased the likelihood of dispute initiation without necessarily producing war. In addition, the growth rate of the challenger—*not* the decline of the hegemon—was very important in explaining the dispute-initiation behavior of *both* countries. Thus, the logic of power-transition theory can be linked theoretically and empirically to lower levels of conflict behavior than war.

Beyond these main findings, two other results bear reiteration. First, the relative satisfaction of the hegemon vis-à-vis the challenger was shown to be important in explaining the dispute-initiation behavior of the hegemon. This finding fits *theoretically* with notions of power transition, but the literature collectively *assumes* that the hegemon is satisfied. I would not contest that the hegemon is more likely to be satisfied than dissatisfied and is likely to be more satisfied than all other countries. Indeed, my data on international influence suggest that this is the case for the United States during the period under examination. But this contrasts with Kim's (1991) measure of a challenger's dissatisfaction in which the hegemon's satisfaction is fixed at one (i.e., the most satisfied that it can be). My results suggest that more emphasis should be placed on measuring the hegemon's satisfaction rather than simply assuming it.

Second and more importantly, the methodology employed here presents a technique for examining contingent decision-making in international relations within a unified model. The particular estimation technique—bivariate probit—also allows the researcher to parse out whether the decisions are in fact independent and, if they are not, the general direction of contingency. In the present study, I found that the decisions were not independent.

The approach and findings of this paper suggest several areas of future research. In keeping with Lemke (1995), the dispute-initiation behavior between regional rivals could be examined. Looking backward, bivariate probit estimation could be applied to the dispute-initiation behavior between Great Britain and the United States or Germany. Similarly, one could examine American and Soviet military interventions in third-party disputes within the Cold-War context as decisions contingent on the likely reaction of the rival. Looking forward, one could examine conflict patterns between the United States and its most likely challenger—China. Such a project could also have policy implications that may help mitigate the possibility of escalation within this emerging rivalry. In all of these projects it would be important to consider the meaning of “dissatisfaction.” Indeed, Chan (2008) suggests that the United States may be more dissatisfied than China where the issue of Taiwan is concerned. A rising China, whether quickly or slowly, can wait patiently for Taiwan to be reintegrated into the Chinese political and economic sphere. While perhaps inevitable, the United States will see this as an ever diminishing status quo.

The rival’s ambassadorial representation makes sense as a measure of dissatisfaction in the superpower rivalry because their main competition was over the loyalties of the other countries in the system. The same measure may not translate into dissatisfaction in other contexts. The findings clearly show, however, that measuring the dissatisfaction of *both* the challenger *and* the hegemon is fundamental to understanding dispute initiation.

Notes

¹ Empiricists simply assume that preferences change over time according to measures of independent variables. But see Clark (1998) and Frieden (1999) for how rational-choice theory might predict changes in preferences.

² Reed et al. (2008) also examine power-transition theory with inter-state conflict short of war but compare it against bargaining theory's predictions regarding power and the status quo. They find that bargaining theory has greater empirical support.

³ See Carlson (1995) for an exposition on escalation as a process as well as an excellent literature review of previous studies on escalation.

⁴ The annual periodization is a result of several independent variables only being available for the annual level.

⁵ Unlike OLS regression, no tests yet exist for omitted-variable bias for probit models.

⁶ The data for A_{it} for the United States was collected from the *Diplomatic List*, a periodic publication of the United States Department of State. The data for A_{it} for the Soviet Union was collected from two sources. Data for the period 1946 to 1966 is from Edward L. Crowley's (1970) *The Soviet Diplomatic Corps, 1917–1967*; data for the period 1967 to 1993 is from the *Europa World Factbook*. The data for N_t is from the Interstate System Membership data set from the Correlates of War Project at the University of Michigan (cf. Singer and Small 1982).

⁷ That is, $Soviet\ Satisfaction = -2 \times (American\ Ambassadorial\ representation - 0.5) \in [-1, 1]$.

⁸ For ambassadorial representation, the spike is easily explained by an increase in the denominator without a corresponding increase in the numerator (that is, the number of countries sending ambassadors to the United States). For τ_B and the S-score, the explanation is not so simple but has the same fundamental reason. In measuring alliance portfolio similarity, the alliances two countries have with other countries can be depicted as a four-by-four table showing the number of countries that fit in each cell. The more elements that are along the main diagonal, the higher the similarity score (whether τ_B or the S-score). Conversely, the more elements that are along the other diagonal, the lower the similarity score. Because (1) alliances do not change much from year to year and (2) newly sovereign countries are unlikely to have any alliance ties when they gain independence, a large increase in the number of countries in a given year will result in an increase in the "no alliances" cell while leaving the rest of the table unchanged. This increase in the number of elements along the main diagonal thus increase the similarity score even though there has been no substantive change in the global alliance system. None of the new countries in 1960 joined an alliance with either the United States or the Soviet Union in that year.

⁹ The updated Correlates of War data were used for this study. de Soysa, Oneal, and Park (1997) compared power-transition results between Correlates of War and GDP measures of power and found them to be generally consistent.

¹⁰ Lemke and Werner (1996) examined military build up relative to the dominant country using the Correlates of War military expenditure component only. That measure is similar to the rates-of-change measure employed here in that it focuses on changes in capabilities.

¹¹ For example, Defense Secretary Schlesinger raised alarm flags in December 1974 that the United States could become a "second-class power" with respect to the Soviet Union if the present budget trend coupled with inflation continued (Finney 1974).

¹² The results are, however, robust to altering the model specification with respect to these two variables.

¹³ This coding rule produced one year for the Soviet Union—1953—for which no leader was coded as being in power. Stalin was the leader until his death in March, but Khrushchev did not assume the role of party chairman until October. All other years are coded as having one and only one leader.

¹⁴ The results of satisfaction, capability change, and the American domestic variables are robust to the different specifications of Soviet leadership variables in the model to the extent that the inclusion does not produce inefficiencies. For example, if *Gorbachev* is estimated on the American side of the analysis while *Khrushchev* and *Brezhnev* are estimated on the Soviet side of the analysis, the results regarding the main hypotheses do not change but the Soviet leadership variables become insignificant.

¹⁵ See Meng and Schmidt (1983) and Greene (1990, 660-663) for a technical discussion of bivariate probit and its properties.

¹⁶ The reduction-in-error (ROE) measure used here is the same as that used in Brenner, Hagle, and Spaeth (1990). $ROE\% = (\% \text{ Correct} - \% \text{ in modal category}) / (\% \text{ in modal category})$. The modal category for each dependent variable is "no initiation"; the percent in the modal category for each variable is 71.7% and 63.0%, respectively.

¹⁷ $LRI = 1 - \ln L / \ln L_0$, where $\ln L_0$ is log likelihood of the null model. $\ln L_0 = -58.45$ for this model. See Greene (1993, 651).

¹⁸ The "probability of correct prediction" for an observation is the marginal probability (e.g., pmarg1 in Stata®) of

dispute initiation *if* there was a dispute initiated by the subject country in that year and the probability inverse of the marginal probability (i.e., $1 - pmarg1$) *if* there was *no* dispute initiated by the subject country in that year.

¹⁹ For the three years that the model gives incorrect predictions on both dependent variables, the actual behavior was as follows: 1965, the United States initiated a dispute but the Soviet Union did not; 1970, both sides initiated disputes; 1979, the Soviet Union initiated a dispute but the United States did not.

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