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Determinants of the Success of Economic Sanctions: An Empirical Analysis*

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Do economic sanctions against target countries work as sender countries intend? If so, what factors make the positive outcomes possible in economic sanctions? Using quantitative methods with the extensive data collection on economic sanctions cases, this study tests a set of hypotheses derived from previous research on the topic and from other theories in the field of international relations. The empirical analyses of this study provide some new findings that were not revealed through previous research on the subject. First, economic sanctions imposed by the United Kingdom were more likely to succeed. Second, economic sanctions imposed in response to human rights abuses in target countries were less likely to succeed. Finally, the results of this study provide evidence to support the "democratic peace theory": the democratic regime type of the sender nation had a positive impact on the success of economic sanctions.

Keywords: economic sanctions, sanctions success, logistic analysis, marginal effect analysis

1. INTRODUCTION

As Bergeijk points out, "[the] end of the Cold War served as a starting point for a true proliferation in the use of economic sanctions as an instrument of foreign policy" (1995, 443). With this proliferation of economic sanctions, the question of "Do economic sanctions work?" has been of increasing interest for both policy makers and researchers in the field of international relations. Do economic sanctions against target countries work as sender countries intend? If so, what factors make the positive outcomes possible in economic sanctions? Dashti-Gibson, Davis, and Radcliff are correct when they argue that "[although] the literature on economic sanctions is voluminous, there is a virtual absence of systemic empirical studies of the conditions that render sanctions likely to success" (1997, 608; see also Bergejik 1995). As they point out, previous research on this topic has been focused primarily on either qualitative case studies or purely theoretical, deductive models.

This lack of empirical research to test the presumed hypotheses using large *N*s is one important gap to be filled in the study of economic sanctions. This study attempts to test a set of hypotheses with quantitative methods using the extensive data collection on economic sanctions cases assembled by Hufbauer, Schott, and Elliot (hereafter HSE, 1985, 1990, 2007). This study consists of four parts. First, I review the existing literature on this topic. Second, I present the hypotheses to be tested and the operationalization of the variables in my model of economic sanctions. Third, I present the essential results revealed from the logistic estimation method and the marginal impact analysis. Finally, I summarize the major findings and the contribution they make to the existing research on this topic.

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2. LITERATURE REVIEW

As Dashti-Gibson, Davis, and Radcliff points out (1997), the previous literature on economic sanctions relied primarily on case studies or formal models. One of the most influential examples of research on this topic must be *Economic Sanctions Reconsidered* by HSE. The lack of extensive data collection on sanctions cases posed a serious problem for researchers oriented on quantitative analysis using large *N*s in the study of economic sanctions. Referencing the government documents of both sender and target countries, well-known sources of economic data, such as the International Monetary Fund's *Direction of Trade* and *International Financial Statistics*, and historical reviews, such as Keesing's *Contemporary Archives*, these three economists have collected data on 20th century sanctions cases. For each sanctions case, they list the chronology of key events, goals of sender country, response by target country, attitudes of other countries, economic impact of the sanctions case, and their assessment of overall success.

> [The data from HSE are] surely the most comprehensive and sophisticated data collection on sanctions available—indeed, to our knowledge the only existing data base appropriate for numeric analysis.... (Dashti-Gibson, Davis, and Radcliff 1997: 611)

By using the HSE data of 103 sanctions cases, Bergeijk (1989) tests the factors that affect the success of economic sanctions. He uses the logistic estimation method with the binary dependent variable: he codes 1 if the HSE "success score" in each sanction case equals or exceeds 9, otherwise 0. Using five independent variables from HSE (1985) and his own "sender reputation" variable measured by the number of the sender's previous sanctions in a period of 10 years, he finds that three of the HSE variables ("pre-sanction relations between sender and target," "sanction length," and "target conditions") along with his "sender reputation" variable reached statistical significance in his logistic model. Dashti-Gibson, Davis, and Radcliff (1997) use the dichotomous "policy result" variable as the dependent variable in their logistic models by taking the value 1 when the policy result has a successful outcome (3 and 4 of HSE values), otherwise 0.[1] They argue that the factors affecting the success of economic sanctions are dependent on the goals of the sender country; therefore, they run different logit models with the sender's different goals: destabilization and all other goals of the sender country, respectively. They summarize their findings as follows: first, when the sender's goal is simply destabilization, the main determinant of success is the target conditions. Second, for all other goals, the use of financial sanctions is the most effective, while there is a modest downward trend over time in the effectiveness of sanctions of this category.

Three other influential cases of research on this topic are *Coercive Cooperation: Explaining Multilateral Economic Sanctions* by Martin (1992), *Economic Statecraft* by Baldwin (1985), and *Revisiting Economic Sanctions Reconsidered* by Drury (1998). First of all, Martin seeks to answer the question regarding the cooperation among senders while imposing economic sanctions. She argues that such cooperation in sanctions cases has two

[1] Their dependent variable (the dichotomous "policy result" variable) is different from that of HSE (the continuous "success score" variable) and that of Bergeijk (1989, the dichotomous "success score" variable).

links to the question of the sanctions' effectiveness: "a successful sanctions effort usually requires cooperation among the target state's trading partners" and "governments take into account the probability that sanctions will be effective when deciding whether to impose them" (1992, 6). She tests her hypotheses using three different statistical methods with three different dependent variables of the cooperation among senders. First, she uses the OLS regression method with the continuous dependent variable that measures the level of cooperation among senders; second, she uses the ordered-probit estimation method with the ordinal dependent variable that measures cooperation on a four-point scale; finally, she uses an event-count analysis with the dependent variable that is measured by the number of countries imposing a sanction. Her general findings using the quantitative models are the statistical significance of such independent variables as "target condition," "international assistance to target," "cost to sender," and "participation of institution" in the assessment of the cooperation in each sanctions case. In his book *Economic Statecraft*, Baldwin argues that economic sanctions cannot be analyzed in isolation but must be compared to the costs and benefits of other potential state actions (1985). In spite of the usual high cost of the sender country, he argues that sanctions appear to have more usefulness than is commonly attributed to them. Finally, Drury (1998) revisits the analysis in HSE's *Economic Sanctions Reconsidered* and argues that there are problems with their empirical analysis that significantly affect HSE's recommendations. Using the ordered-logit method with the dichotomous "policy result" dependent variable, he finds that cooperation has only a negative effect on success when international organizations are not involved, and that nations trying to subvert the sanctions only succeed when the target is originally dependent on the sender for its imports.

As Martin (1992) correctly points out, a substantial amount of research has been focused on a few important sanction cases regarding this topic using case studies. Among others, the League of Nations' sanctions against Italy in 1935-36, the sanctions against both Rhodesia (1965-79) and South Africa (1962-), and the US grain embargo against the USSR in 1980 are some of the cases that have generated researchers' interest (Galtung 1967; Nossal 1989). Recently, more interesting research has been conducted on this topic. By examining the sanctions cases in the 1990s, Bergeijk argues, "[the] fact that the role of the UN and the other international organizations has become more important, increases the potential scope of non-violent approaches to diplomatic conflict resolution, such as sanctions, arbitrage, and financial compensation" (1995, 443-444). In his interesting article, titled "Sanctions at Bay," Rodman (1995) argues that his historical case studies of the US sanctions against Nicaragua (1981-), Libya (1978-), South Africa (1985-), confirm the hegemonic decline model. He asserts that since the failure of the US sanctions effort against the Soviet-European gas pipeline (1980), the decline of the US hegemony has led to the general ineffectiveness of economic sanctions.

3. ANALYSIS OF THE SUCCESS OF ECONOMIC SANCTIONS

3.1. General Approach

Even though there have been several empirical analyses focused on sanctions success, HSE (1990) provide the benchmark for data analyses on sanctions success. My sanctions success model setup focuses on the original HSE analyses and the Drury (1998) revised

model (see also Cox and Drury 2006), which have been regarded as fully specified models on sanctions success. I base my analysis on their sanctions success model to facilitate comparison with previous research. However, I performed a set of sensitivity analyses to determine the robustness of the results (e.g., varying the models by adding or dropping some of the control variables), and the overall pattern with this sensitivity test confirms my findings. Equation 1 summarizes the set of hypotheses on the success of economic sanctions that are tested below:

$$\text{Success of Economic Sanctions}_t = ß0 + ß1*\text{Sanction against Human Rights}_t + ß2*\text{US as a Leading Sender}_t + ß3*\text{US Hegemony}_t + ß4*\text{US as a Leading Sender*US Hegemony}_t + ß5*\text{UK as a Leading Sender}_t + ß6*\text{Democracy Level of Sender}_t + ß7*\text{Democracy Level of Target}_t + ß8*\text{Democracy Level of Sender*Democracy Level of Target}_t + ß9\sim ß19*\text{Other Control Variables}_t + e \quad \text{(Equation 1)}$$

3.2. Hypotheses

Now, I turn to the list of hypotheses to be tested in this study, which is sorted into six categories, namely the hypotheses related with "time," "type," "hegemonic decline theory," "sender," "target," "relationships between sender and target," and "democratic peace theory." This section provides details on the main hypotheses tested in this study, while the details of the other control variables in the model are explained in Appendix A (see also Kim 2007).

The first hypothesis is related to the "type" of economic sanction.

Hypothesis (type) 1. *Sanctions against human rights violations in the target have a lower probability of success.*

An important hypothesis missing from previous research on the topic would be whether sanctions against the target's violations of human rights are less successful. My hypothesis is important because this type of sanction has been imposed more frequently in recent years; in fact, the data from HSE show that 17 out of 18 sanction cases of this type have been imposed since 1973 (some of the recent cases are the US and UK against Somalia in 1988, the US against Sudan in 1989, and the US against China in 1989). The theoretical reasons for the relative ineffectiveness of this sanction type must be twofold. First, the goals of the sender in this type of sanction tend to be more symbolic than others; for example, in response to its citizens' moral concerns, the US frequently tends to impose symbolic economic sanctions against human rights violations by small Third World countries, such as Sudan, Somalia, Burma, and Haiti. Second, challenges to the target's internal behavior (e.g., human rights abuses) compared to those of its external behavior (e.g., attacking a neighbor) are more likely to be viewed as attacks on the target's sovereignty.

The next three hypotheses are related to the "hegemonic decline theory," which has not been applied to the empirical research on economic sanctions.

Hypothesis (hegemonic decline model) 2. *Sanctions by the US as a leading sender have a higher probability of success.*

Even though there has been no previous research that tests this theory on this topic, it remains an important question regarding the success of sanctions because the US has imposed the largest proportion of sanctions cases. Bergeijk (1989) seems to have this hypothesis in mind when he tries to determine the effect of the sender's reputation on the success of sanctions cases as measured by the sender's previous sanctions over a period of 10 years. The result of a positive coefficient and the statistical significance of this variable in his model implies that US sanctions should have the higher probability of success. According to the next hypothesis, however, there should be mixed results between the US sanctions before the US decline of hegemony and those after.

Hypothesis (hegemonic decline model) 3*. There is a downward trend in the success of sanctions after the decline of the US hegemony.*

Some have argued in support of this hypothesis (HSE 1990; Rodman 1995); however, the reasoning used in arguments is somewhat different from this study. By splitting sample cases into those initiated before 1973 and those after 1973, HSE (1990) find that the success rate of the pre-1973 cases was higher than that of the post-1973 cases. They explain this result relative to declining hegemony of the US—the "Nixon shock" and the end of Bretton Woods system in 1973—which has been the leading sender in many sanctions cases. However, I argue that simply comparing the two rates of success without accounting for other control variables in a multivariate setting cannot show any significant evidence to support their argument. Rodman also argues that the US hegemonic decline regarding the success of sanctions cases has been shown more clearly after the failure of the US sanctions against the Soviet-European gas pipeline in 1980.

Hypothesis (hegemonic decline model) 4*. Sanctions by the US as a leading sender after the decline of its hegemony have a lower probability of success.*

This hypothesis is introduced to test the interaction effect of hypotheses 2 and 3 above. I argue that sanctions imposed after 1973 are less likely to succeed because of the declining power of the US, which has been the leading sender of many economic sanctions. This argument derives essentially from the previous research on the "hegemonic decline theory" in the field of international relations.

The next hypothesis is related to the "sender" perspective in economic sanctions.

Hypothesis (sender) 5. *Sanctions by the UK as a leading sender have a higher probability of success.*

Besides the US (78 cases), the UK has been another leading sender of economic sanctions throughout history. Except for the USSR (7 cases), no leading sender has imposed sanctions more than 5 times. Notably, as a leading sender, the UK has imposed 13 cases of economic sanctions. Therefore, it is an interesting question to ask whether sanctions sponsored by the UK have met with different results in terms of their success and, if so, what the reasoning is for the success. Martin (1992) argues that the leading sender must demonstrate a credible commitment to the threats for the success of its sanction. Bergeijk (1989) and Dashti-Gibson, Davis, and Radcliff (1997) argue that the more often the same state imposes sanctions, the less credible that country's commitment or seriousness appears

to the target nations. I argue that this leads to the relative effectiveness of sanctions imposed by the UK compared to those by the US (the two leading sanction imposers). The UK, which not only has sufficient power to impose effective sanctions (like the US) but also can demonstrate credibility for the sanctions by sending a clear message to the target countries (unlike the US), can make its sanctions more effective. The argument is also substantiated by five principles in practicing UK sanctions (the Authority of the House of Lords 2007): hit the regime rather than people; have exemptions that minimize the humanitarian impact on civilians; have clear objectives and exit strategies; have an effective arrangement for implementation and enforcement; avoid unnecessary impact on UK economic interests. The sufficient power to impose sanctions with credible commitments combined with careful selection of issues and policies over which to implement sanctions leads to the relative effectiveness of UK-led sanctions compared to sanctions imposed by other states (including the US).

The final set of three hypotheses is related to the "democratic peace theory," which has not been applied to empirical research on economic sanctions.

Hypothesis (democratic peace theory) 6*. The more democratic the sender, the higher the probability of success.*

Hypothesis (democratic peace theory) 7*. The more democratic the target, the higher the probability of success.*

Hypothesis (democratic peace theory) 8. *Sanctions by democratic senders against democratic targets are more likely to succeed than otherwise.*

As HSE argues, a democratic state is "far more susceptible to sanction than authoritarian countries isolated from world opinion" because "the elite [in a democratic state] cares what the rest of the world thinks" (1998, 4). Following the "perpetual peace" argument by Immanuel Kant (1970), scholars in the camp of "democratic peace" have examined the relationship between democracy and peace. The main research topics in this camp have been the role of democratic norms and institutions on militarized conflicts; however, that focus has been expanded to include the economic conflicts among countries. For example, Reinhardt (1999) and Bush (2000) posit that the arguments of "democratic peace" can be applied to the economic disputes between states to study empirically the impact of democracy on GATT disputes and trade disputes, respectively. There will be two theoretical arguments in which the arguments of "democratic peace" apply to the outcomes of economic sanctions. First, the institutional argument of "democratic peace" can be applied to the success of economic sanctions initiated by democratic countries. Economic sanctions impose political costs on a leader's winning coalition. Desiring to retain political office, leaders in democratic states, unlike those in nondemocratic states, respond to the demands of their relatively large winning coalitions. This greater accountability means that democratic leaders place a higher priority on successful public policies, including policies regarding economic sanctions (Hart 2000; Lektzian and Souva 2007). Because of this, leaders in democracies are very careful when pursuing policies regarding economic sanctions, which leads to the relative effectiveness of the sanctions imposed by democratic states (see also Siverson 1996). Second, the audience cost argument of "democratic peace" can be applied to the successful outcome of sanctions initiated by democracies. Economic sanctions by democratic states will be more successful than those by nondemocratic senders because they generate potential audience costs (Hart 2000; Lektzian and Souva 2007). The audience cost plays a role in

conveying a state's intention to the other party in an economic dispute. Democracies that usually have stronger audience costs due to their higher structural (i.e., institutional) constraints compared to nondemocracies, are able to signal their true intentions concerning their policies on economic sanctions more credibly and clearly than nondemocracies (see Bueno de Mesquita and Lalman 1992, Fearon 1994). In other words, democracies are very credible in their threats related to economic sanctions, and this credible signal of resolve leads to more successful outcomes of sanctions imposed by democratic states compared to those instituted by nondemocracies. Therefore, I hypothesize that a sanction aimed at a democratic target is more likely to succeed than one aimed toward an autocratic state. I also hypothesize that a sanction by a democratic sender is more likely to succeed and that there is an interaction effect among the two factors—a sanction by a democratic sender against a democratic target is more likely to succeed than otherwise.

3.3. Research Design

The data to be used in this empirical chapter are from international economic sanctions cases from HSE's collection of each sanction's episodes[2]. Even though there has been some criticism about the data they collected, not only has this data collection been used widely in the study of this topic to date but it is "the only existing data base" for the quantitative study of economic sanctions (Dashti-Gibson, Davis, and Radcliff 1997). I test a large set of hypotheses using the logistic estimation. I also try to determine the marginal effects of each independent variable in my empirical model to derive the substantive meanings of each hypothesis.

3.4. Dependent Variable: "Policy Result"

I use a dichotomous dependent variable to indicate the policy result. HSE (1990) assessed both the "policy result" (that measures "the extent to which the outcome sought by the sender was in fact achieved") and the "sanctions contribution" (that measures "the extent to which the sanctions contributed to a positive result," 1990, 41). Then, the two measurements, which have ordinal values between 1 and 4, are multiplied to obtain their "success score" dependent variable. However, some problems have been noticed with this procedure. As Dashti-Gibson,

[2] The sanction episodes by HSE (1990, 2) are described as "the deliberate, government inspired withdrawal, or threat of withdrawal, of customary trade or financial resources," where foreign policy goals "encompass changes expressly and purportedly sought by the sender state in the political behavior of the target state." For the participants in a sanction episode, the term "sender" designates the country (or international organization) that is "the principal author of the sanction episode" (35) and "target" designates the country that is "the immediate object of the episode" (36). However, some scholars use different definitions of sanctions in their studies: Miers and Morgan (2002) define sanction as an "action that one or more countries take to limit or end their economic relations with a target country in an effort to persuade that country to change its policies" (117); Blanchard, Mansfield, and Ripsman (2000, 3) define sanction as an action "taken by one state—the sender—to interfere with the economy of another state—the target—for the purpose of coercing its compliance with the sender's wishes." Drezner (2003) uses the terms "economic sanctions," "economic coercion," and "economic statecraft" interchangeably, but Baldwin (1985) provides the rationale to differentiate among those terms.

Davis, and Radcliff (1997, 611) point out, there is a reliability problem with the HSE measurements of both "policy result" and "sanctions contribution". In addition, Dashti-Gibson, Davis, and Radcliff (1997, 611) and Bergeijk (1989) argue that there is "no theoretical, empirical, or statistical reason for the policy outcome to be multiplied by another variable designed to assess the contribution of sanctions to the observed result." To overcome some of these problems, following the convention of empirical studies on sanctions, I dichotomize the "policy result" variable of HSE by taking the value of 1 (success) when there is a successful outcome (the values of 3 and 4 from HSE) and of 0 (failure) otherwise.[3] By using the dichotomous dependent variables, I expect to avoid some of the unreliability and ambiguity of the HSE data.

3.5. Independent Variables[4]

Sanction against Human Rights. Sometimes, the sender country imposes economic sanctions against the target country's human rights violations. By using the HSE categorization of each sanction case and adding the three sanctions cases against South Africa in 1962 and 1985 and against China in 1989, if this type of sanction is imposed, it is coded 1, otherwise 0. According to my data set (see Appendix B: frequency distribution of each dichotomous variable), there have been 18 sanctions of this type.

US as a Leading Sender. The US has been the primary sender in the history of economic sanctions: it has imposed 78 unilateral or joint sanctions since 1914. This variable is coded 1 if the US initiated the sanctions either unilaterally or jointly with other countries or an international institution, otherwise 0. However, the unilateral sanctions by an international institution are not counted as 1 for this variable even though the US is one of the participants in that institution, such as the UN.

US Hegemony. This variable measures whether the sanctions are imposed before or after the decline of the US hegemony. Sanctions imposed before 1973—the Nixon shock and the end of Bretton Woods system—are coded as 0, otherwise 1. Among my 116 cases, 68 sanctions are coded 0 (before 1973) and 48 sanctions are coded 1 (after 1973).

*US as a Leading Sender * US Hegemony*. This interaction variable takes the value of 1 if the US initiated the sanctions either unilaterally or jointly with other countries or an

[3] The conventional wisdom in the sanctions success study centers on the use of a "policy result" dependent variable by dichotomizing the four-point scale variable by HSE; in fact, HSE define economic sanctions as financial or trade restrictions used by a state in order to change another nation's policies in some pre-specified manner (see also Drury 1998: 500). Drury (1998) argues that using a "sanctions contribution" (or its interaction with "policy result") dependent variable causes redundancy and endogenous problems (contribution affecting some of the conventional independent variables). Drezner (1999) argues that "using a dependent variable that consists partially of whether sanctions contributed to the outcome is tautological in the extreme. The goal of the research effort is to determine if the dependent variables have an effect on the policy outcome. Their contribution is determined by the sign and significance of their coefficients in a multivariate regression. Including the contribution part of the dependent variable distorts the results"(68, footnote 21). Dashti-Gibson, Davis, and Radcliff (1997) and many others emphasize the ambiguity in the four-point scales of the HSE "policy result" variable and recommend using the binary version of the variable.

[4] The measurements on other control variables are presented in detail in Appendix A.

international institution when it was in the position of hegemony (before 1973); otherwise, 0. 87 sanctions are coded 0 and 29 sanctions are coded 1 in my data set.

UK as a Leading Sender. This variable is coded 1 if the UK is a leading sender either unilaterally or jointly, otherwise 0. The same logic regarding the UK's participation in international institutions' sanctions is applied to the coding rule of this variable. There have been 13 sanction cases of this type.

Democracy Level of Sender, *Democracy Level of Target*, and *Democracy Level of Sender * Dummy Democracy Level of Target.* These variables are obtained by using the *Polity III* dataset (Gurr, Jaggers, and Moore 1996). First, I constructed the index by subtracting the autocracy index for each country in the data set from its democracy index—the final index ranges from -10 to 10—and this final index was rescaled from 0 to 20 for ease of interpretation of the statistical result (Rousseau et al. 1996, 510). The interaction term is composed of the sender democracy score multiplied by a dummy version of the target democracy score. If the latter is 17 or greater on the democracy scale, the dummy variable is coded 1; otherwise, it is coded 0 (Rousseau et al., 1996). Therefore, in the US sanction case against China in 1989, the value on the first variable (democracy level of sender: the US) is 20, that on the second variable (democracy level of target, China) is 3, and the interaction term is 0 (see Appendix C: descriptive statistics of each variable).

4. RESULTS AND DISCUSSION

My empirical analysis of sanctions success is based primarily on two statistical procedures. First, with the "policy result" dichotomous dependent variables,[5] I provide the results from my logit estimation[6] to show the statistical meanings of each of my hypotheses (see Table 1). Then, I pay close attention to the substantive meanings of each of my hypotheses by calculating the marginal effects of each independent variable in my model (see Table 2). This is because the statistical results can have more reasonable significance when they are combined with the substantive consideration. The results in Table 2 of marginal effects show the probability of success of economic sanctions and the change in probability related to each of my independent variables, holding all other variables in their means or modes.

The first set of results to be discussed is those for the variables related with "time" and "type." The hypothesis on *Sanction Duration* predicts that the coefficient on this variable will be positive, and the result shows that it has the expected sign (0.0205) but fails to reach statistical significance in my sanction success model (p-value 0.7873). The next two hypotheses are related to the "type" of economic sanctions. The hypothesis on *Sanction of*

[5] HSE (1990) use the "success score" dependent variable that results from multiplying their "policy result" variable by the "sanction contribution" variable. However, as I mentioned previously, there has been some criticism of their dependent variable. In my study, I use the dichotomized "policy result" variable as my dependent variable. I have tried to create a new kind of "success score" variable by adding their "policy result" and "sanction contribution" variables together; however, the Cronbach's alpha of 0.577 (with the inter-item correlation of 0.895) shows that the new scale adding those two variables is quite unreliable.

[6] The results from my logit estimation are almost identical to those from the ordered-logit estimation using the same set of independent variables.

Table 1. Multivariate Analysis of Success of Economic Sanctions

Independent Variables	Coefficients (Standard Error)
Sanction Duration	0.0205 (0.0377)
Sanction of Financial Type	0.8213 (0.7012)
Sanction against Human Rights	-1.7233* (0.8635)
US as a Leading Sender	-1.1211 (0.9875)
US Hegemony	1.0987 (1.3734)
US as a Leading Sender * US Hegemony	-1.1053 (1.5644)
UK as a Leading Sender	1.3246 (0.9649)
International Institution as a Leading Sender	0.6039 (0.9956)
International Cooperation for Sender	-0.8951* (0.4331)
International Institution as a Leading Sender * International Cooperation for Sender	0.5278 (0.3600)
Cost to Sender	-0.8565^{+} (0.4527)
International Assistance to Target	0.5849 (0.7786)
Target Conditions	-0.2256 (0.4670)
Cost to Target	0.4410^{+} (0.2421)
Presanction Relations between Sender and Target	0.8093 (0.5003)
Economic Difference	-0.0010 (0.0010)
Democracy Level of Sender	0.1458^{+} (0.0828)
Democracy Level of Target	0.0437 (0.0616)
Democracy Level of Sender * Dummy Democracy Level of Target	-0.0758 (0.0689)
Constant	-1.4549 (2.6913)
N	100
-2 Log Likelihood	102.191
Chi-Square	36.279
% Correct	73.00%

Note: All significance tests are one-tailed; $^{+}$p <= .10, *p <= .05, **p <= .01

Financial Type predicts that the coefficient on this variable will be positive and the result shows that it has the expected sign (0.8231) but fails to reach statistical significance in my model. Next, my hypothesis on *Sanction against Human Rights* predicts that the coefficient on this variable will be negative, and my result shows that it is strongly negative (-1.7233) and statistically significant at better than the 0.05 level. The results from marginal effects also illustrate the relative importance of this variable: the predicted probability of success decreases 29 percentage points by changing the value of this variable from 0 (a sanction not related with human rights) to 1 (a sanction against human rights). These results, with both logit estimation and marginal effects analyses, show that sanctions against the target country's human rights violations clearly have more difficulty succeeding than otherwise.

The next three of my hypotheses are related to the "hegemonic decline theory." These hypotheses argue that sanctions by the US after its declining hegemony will be less likely to succeed than otherwise. The results do not support this argument: any of all three coefficients on their variables fails to achieve statistical significance and, more importantly, the interaction term has the unexpected sign (-1.1053).[7] The result from the marginal effects

[7] Accepting Wallerstein's (1983) argument that US hegemony ended in 1967 instead of 1973 does not change any of the results in my analysis.

Table 2. Marginal Effects on Success of Economic Sanctions

	Probability	Percentage Point Change from Value Above
Sanction against Human Rights		
No	39	
Yes	10	-29
US as a Leading Sender		
No	68	
Yes	39	-29
US Hegemony		
No	39	
Yes	55	16
US as a Leading Sender * US Hegemony		
0	68	
1	55	-13
UK as a Leading Sender		
No	39	
Yes	66	27
International Cooperation for Sender		
1.97 (Mean)	39	
3.05 (One Standard Deviation)	20	-19
4.00 (Maximum)	9	-11
Total Change		-28
International Institution as a Leading Sender * International Cooperation for Sender		
0.90 (Mean)	39	
2.32 (One Standard Deviation)	55	16
3.74 (Two Standard Deviations)	70	15
Total Change		31
Cost to Sender		
1.90 (Mean)	39	
2.73 (One Standard Deviation)	24	-15
3.56 (Two Standard Deviations)	14	-10
Total Change		-25
Cost to Target		
1.83 (Mean)	39	
6.96 (One Standard Deviation)	80	31
12.09 (Two Standard Deviations)	98	18
Total Change		49
Presanction Relations between Sender and Target		
2.13 (Mean)	39	
2.85 (One Standard Deviation)	51	12
3.00 (Maximum)	54	3
Total Change		15
Economic Difference		
568.64 (Mean)	39	
3658.90 (One Standard Deviation)	2	-37

6749.16 (Two Standard Deviations)	0	-2
Total Change		-39
Democracy Level of Sender		
1 (Minimum)	7	
10	21	14
20 (Maximum)	48	27
Total Change		41
Democracy Level of Target		
1 (Minimum)	32	
10	42	10
20 (Maximum)	53	11
Total Change		21
Democracy Level of Sender *		
Dummy Democracy Level of Target		
0 (Minimum)	43	
10	26	-17
20 (Maximum)	13	-13
Total Change		-30

Note: The marginal analysis calculates the change in the predicted probability of sanctions success for an *X* unit change in the independent variable of interest (while holding all other independent variables at their means or modes).

analysis also confirms those from the logit estimation: the predicted probability of success decreases 13 percentage points by changing the value of the interaction variable from 0 (a sanction by the US after its hegemonic decline) to 1 (a sanction by the US when it was in the hegemonic position). Next, the results regarding my own hypothesis on *UK as a Leading Sender* show that sanctions enacted by the UK are indeed more likely to succeed than otherwise. Even though it falls short of the conventional thresholds of statistical significance (p-value 0.1698), the result from the marginal effects analysis shows that the predicted probability of success increases 27 percentage points by changing the value of this variable from 0 (a sanction not by the UK as a leading sender) to 1 (a sanction by the UK as a leading sender).

The next three hypotheses are tested to replicate Drury's (1998) findings. Based on his observations that international cooperation with the sender has only a negative effect on success when international institutions are not involved, these hypotheses predict that the coefficient on *International Cooperation to Sender* will be negative (and statistically significant) and that on the interaction term will be positive (and statistically significant). My results from the logit model support his findings: the coefficient on the cooperation variable is solidly negative (-0.8951) and statistically significant at better than the 0.05 level, and that on the interaction term is slightly positive and falls just short of conventional thresholds of statistical significance (p-value 0.1426). The results from the marginal effects analysis also confirm his findings: changing the value of the cooperation variable from its mean (1.97) to its maximum (4.00) decreases the predicted probability of success by 28 percentage points, and changing the value of the interaction term from its mean (0.90) to two standard deviations above its mean (3.74) increases the predicted probability by 31 percentage points. Another hypothesis related with "sender" is that on *Cost to Sender*. This hypothesis predicts

that the coefficient on this variable will be negative, and my results support this hypothesis. The coefficient on this variable is solidly negative (-0.8565) and statistically significant at the 0.10 level (p-value 0.0585).[8] Changing the value of this variable from its mean (1.90) to two standard deviations above its mean (3.56) decreases its predicted probability of success by 25 percentage points. The results from these four hypotheses show that sanctions are less likely to succeed than otherwise when international cooperation increases in the absence of the participation of international institutions and when cost to sender is relatively large.

Three hypotheses related with "target" predict that the coefficients on both *International Assistance to Target* and *Target Conditions* will be negative, and that the coefficient on *Cost to Target* will be positive. First, the coefficient on the international assistance variable has the unexpected positive sign (0.5849) and that on the target condition variable has the expected negative sign (-0.2256); however, both of them fail to achieve statistical significance (p-values 0.4525 and 0.6289, respectively), which makes the results received from the logit model somewhat dubious. Second, the coefficient on the target cost variable is slightly positive (0.4410) and statistically significant at better than the 0.10 level. The result from the marginal effects analysis also confirms the significance of this last factor: the predicted probability of success increased by 49 percentage points by changing its value from 1.83 (mean) to 12.09 (two standard deviations above its mean). These results show that the only important factor related with "target" is the cost to target: the higher the cost to target, the higher the probability of success. The next two factors are related with the "relationships between sender and target." Both hypotheses on *Presanction Relations between Sender and Target* and *Economic Difference* predict the positive sign of its coefficient. First, the coefficient on the presanction relations variable has the expected positive sign (0.8093) and falls just short of the conventional thresholds of statistical significance, and the result from marginal effects also shows the significance of this factor: slightly changing its value from 2.13 (mean) to 3.00 (maximum) increases the predicted probability of success by 15 percentage points. These results confirm the argument that sanctions are more likely to succeed when the sender has a cordial relationship with the target. Next, the coefficient on *Economic Difference* is unexpectedly negative (-0.0010) but fails to achieve statistical significance.[9]

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[8] I transformed all of my categorical independent variables into dichotomous variables and ran my logit model again. The dichotomous *Cost to Sender* variable takes the new values of 0, when a sanction was "net gain to sender" (HSE value of 1) and 1, when a sanction was either "little effect on sender" or "modest or major loss to sender" (the original values of 2, 3, and 4). The dichotomous *International Cooperation for Sender* variable takes the new values of 0, when there was "no or minor cooperation" (the original values of 1 and 2) and of 1, when there was "modest or significant cooperation" (the original values of 3 and 4). The dichotomous *Target Conditions* variable takes the new values of 0, when either target was "distressful" or had "significant problems" (the original values of 1 and 2, respectively) and of 1, when it was "strong and stable" (the original value of 3). Finally, the dichotomous *Presanction Relations between Sender and Target* variable takes the new values of 0, when the prior relations were "antagonistic" or "neutral" (the original values of 1 and 2, respectively) and of 1, when they were "cordial" (the original value of 3). Using these dummy variables instead of the original categorical variables does not change any results in my analysis.

[9] The normality tests of this and five other independent variables—Sanction Duration, Cost to Target, Democracy Level of Sender, Democracy Level of Target, and Democracy Level of Sender * Dummy Democracy Level of Target—show that the ratios of both skewness and kurtosis to its standard error

Finally, the next three of my hypotheses are related with the "democratic peace theory." These hypotheses predict that the coefficients on all of their variables will be positive. My results support only part of the argument from those hypotheses. The coefficients on both *Democracy Level of Sender* and *Democracy Level of Target* have the expected positive signs (0.1458 and 0.0437, respectively) and that on the former variable is statistically significant at the 0.10 level. The result from marginal effects also supports the significance of this factor: by changing its value from 1 (a fully autocratic sender) to 20 (a fully democratic sender), the predicted probability of success increases by 41 percentage points. However, not only does the coefficient on the latter variable fail to achieve statistical significance (p-value 0.4785), but that on *Democracy Level of Sender* * *Dummy Democracy Level of Target* is unexpectedly negative (-0.0758) and statistically insignificant (p-value 0.2712). Given this set of findings, I conclude that the democratic regime type of sender has a positive impact on the success of sanctions, but that of the target does not have any clear impact on the success of economic sanctions.

5. CONCLUSION

My empirical investigation identifies a number of explanatory variables as determinants of the success and failure of international economic sanctions. These general findings are derived by using both the logistic estimation method and the marginal effects analysis of the dichotomous "policy result" dependent variable. The bivariate analysis also generally confirms my findings (see Appendix D). My investigation of the violations of assumptions of the statistical model shows that there are no cases of multicollinearity, heteroskedasticity, and autocorrelation in my model, which therefore confirms the robustness of my empirical findings (see Appendix E-1, E-2, & E-3). Finally, my use of dichotomous independent variables rather than ordinal variables also generally confirms my findings (see footnote 6).

My findings related with the "time," "type," and "hegemonic decline model" suggest three important arguments. First of all, unlike the arguments posited by many researchers, sanction duration and financial type do not have much impact on the success of economic sanctions; rather, the important finding is the relative ineffectiveness of sanctions imposed as a result of the human rights abuses of the target country. This has been one of the missing parts in the study of economic sanctions. This finding was revealed clearly by using both the logistic estimation method and a marginal effects analysis: the statistical significance of this variable is at better than the 0.05 level, and there is a decline of the predicted probability by 29 percentage points when this type of sanction is imposed. Sender countries of this sanction type usually have imprecise symbolic goals regarding its imposed sanctions while target countries of this type are more antagonistic against imposed sanctions because they feel the

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are less than –2 or greater than 2 in those variables. These results show the skewness of the distribution of these independent variables. In order to induce the normal distribution of these variables, I transformed the variables into the logarithmic forms of variables by taking their natural logs. All results in my analysis were held except that on Economic Difference. The logarithmic form of this variable has reached statistical significance at the 0.05 level. The original result from marginal effects also supports this new finding: changing its value from 568.64 (mean) to 6749.16 (two standard deviations above its mean) yields a 39 percentage point decrease in the predicted probability of success.

senders are interfering with their sovereignty. Clearly, Dashti-Gibson, Davis, and Radcliff (1997) are right when they argue that sanctions are not always designed specifically to succeed and that, if the actual goals are purely symbolic or expressive, they can hardly succeed in their true goals. However the hypothesis that economic sanctions have become less effective after the US hegemonic decline fails to achieve any statistical confirmation.

Next, relative to the "sender" of sanctions, I first confirm the findings of Drury (1998) that international cooperation with the sender only has a negative impact on success when international institutions are not involved. Two other important findings related with the "sender" are, first, a sanction is more likely to succeed when it is imposed by the UK. The relative effectiveness of sanctions imposed by the UK is related primarily with the credibility of the sender country. As both Bergeijk (1989) and Dashti-Gibson, Davis, and Radcliff (1997) argue correctly, the more often the same state imposes sanctions, the less credible that country's commitment or seriousness appears to the target nations. The UK, which not only has sufficient power to impose effective sanctions (like the US) but can also demonstrate credibility for the sanctions by sending a clear message to the target countries (unlike the US), can make its sanctions more effective. The sufficient power to impose sanctions with credible commitments combined with careful selection of issues and policies over which to implement sanctions leads to the relative effectiveness of UK-led sanctions compared to sanctions imposed by other states (including the US). This finding shows the importance of the UK as a leading sender, which has been paid little attention to by previous researchers on this topic. Second, the findings show that sanctions are more likely to succeed when cost to the sender country is relatively large − this confirms the empirical findings of most of the previous research. With regard to the "target" and the "regime type" of sender and target of sanctions, first, my findings confirm the previous research regarding the cost to target: the higher the probability that an economic sanction succeeds, the higher the cost is to the target. Finally, my findings related with the regime type provide evidence to support the "democratic peace theory": the democratic regime type of sender has a positive impact, but that of the target does not have any clear impact. Leaders in democracies are very careful when pursuing policies regarding economic sanctions, which leads to the relative effectiveness of the sanctions imposed by democratic states. Democracies are also very credible in their threats related to economic sanctions, and this credible signal of resolve leads to more successful outcomes of sanctions imposed by democratic states compared to those instituted by nondemocracies.

There has been a lack of systemic empirical studies on conditions that consider which type of economic sanctions are most likely to succeed, compared to the large volume of research devoted to qualitative case studies or purely theoretical, deductive models for the study of economic sanctions. The main purpose of this study is to rigorously test a set of hypotheses regarding the conditions for the success of economic sanctions. The set of generalizable findings revealed from this study will be useful for researchers, whose main objective is to find the determinants of success of economic sanctions, and policy makers, whose main policy objective is to increase the effectiveness of their sanctions policies. For researchers, my findings will show the usefulness of quantitative methods on this topic, which have not been used frequently, while for policy makers, the findings will illustrate the conditions necessary to increase the probability of success for the imposed sanctions as one of their important foreign policy tools.

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Appendix A. Additional Hypotheses and Measurements for the Sanctions Success Analysis

1. Hypotheses

The Hypotheses Regarding the Time and Type of Sanction

The first two hypotheses are related to the "time" and "type" of economic sanctions.

Hypothesis (Time) 9. *The longer the duration of sanctions, the higher the probability of success.*

There has been some controversy regarding the duration of sanctions and their success. Some argue that lengthier sanctions increase the probability of success because "sanctions may take time to take effect, and, therefore, the longer they are in force, the greater the disutility experienced by the target" (Dashti-Gibson, Davis, and Radcliff 1997: 609). However, others argue that extended sanctions appear less successful because if sanctions have been successful, they do not need to be continued; senders are reluctant to give up their sanctions even after noticing their failure; and "sending states are not capable of maintaining indefinitely the necessary international solidarity" (609-610). This latter argument has been proven empirically in some analyses: both Bergeijk (1989) and Dashti-Gibson, Davis, and Radcliff (1997) find the negative sign and statistical significance of the duration variable in their models, and HSE (1985) also find the negative sign, but not significance in their model.

Hypothesis (Type) 10. *Compared to the common import/export restrictions, financial sanctions (e.g., freezing assets in the target) have a higher probability of success.*

Unlike the sanctions to use import/export restrictions that often affect the general population but leave the elites untouched, the financial sanctions, by making "a more direct and immediate impact on ruling elites by limiting their access to foreign currency," appear more successful in general (Dashti-Gibson, Davis, and Radcliff 1997: 610). However, HSE (1985) do not find any evidence for this hypothesis: all dummy variables of import, export, and financial types do not achieve statistical significance in their model, and, furthermore, the variable of the financial type has the negative sign in their model, which means that financial sanctions tend to be less rather than more successful.

The Hypotheses Regarding the Sender of Sanctions

The next four hypotheses are related to the "sender" of economic sanctions.

Hypothesis (Sender) 11. *Sanctions by an international institution as a leading sender have a higher probability of success.*

Hypothesis (Sender) 12. *The greater the international cooperation with the sender, the lower the probability of success.*

Hypothesis (Sender) 13. *The greater the international cooperation for sanctions by international institutions, the lower the probability of success.*

This set of hypotheses is one of the main controversies in the determinants of sanction success (the effectiveness of multilateral sanctions vs. unilateral sanctions, as well as that of

sanctions by international institutions). First, policy makers believe generally that multilateral sanctions are more likely to be effective; however, empirical research on sanctions success has found otherwise. HSE argue that sanctions are less likely to be effective if a greater number of states is needed to implement the denial measures (1990, 89). However, for Martin (1992) and other researchers, international cooperation to impose sanctions is the most important factor in determining the effectiveness of such sanctions. For example, Martin argues that "sanctions cannot work if they are unilateral" and that "cooperation is one step removed from success, a necessary if not sufficient precondition" (1992, 6). Another important determinant of sanction success would be sanctions by international institutions, such as the League of Nations, the Arab League, and the UN, and there have been 24 cases of this type so far. Martin (1992) argues that "the leading sender has to demonstrate a credible commitment to the threats [for the success of its sanction]" and that one of the important mechanisms that accompany such credible commitments is the use of international institutions (413). By making the cooperation among other possible sanctioners easier and the free ride enjoyed by those countries more difficult, sanctions by international institutions have a higher probability of success. Drezner (2000) finds that without support from international institutions, the increased levels of cooperation from other states leads to significantly fewer concessions from the target; when there is support from international institutions, cooperation from other states has a positive effect on the target's concessions. Drury (1998) also finds that international cooperation has a negative effect on sanctions success only when international institutions are not involved.

Hypothesis (Sender) 14. *The higher the cost to the sender, the lower the probability of success.*

HSE find that "the costs imposed on domestic firms in the sender country are generally higher in cases that fail than those that succeed," and they give us one of their commandments regarding economic sanctions: "if you need to ask the price, you can't afford the yacht" (1990, 87–8). However, as other researchers including Martin (1992) assert, because high-cost sanctions are related to the high credibility of the sender, they are more likely to succeed. By communicating the clear message to impose and continue its sanctions in spite of their high cost, the sender country can obtain the target country's surrender more easily.

The Hypotheses Regarding the Target of Sanction

The next three hypotheses are related to the "target" of economic sanctions.

Hypothesis (Target) 15. *The more international assistance the target has, the lower the probability of success.*

Hypothesis (Target) 16. *The higher the political and economic stability of the target before sanctions, the lower the probability of success.*

Hypothesis (Target) 17. *The higher the cost to the target, the higher the probability of success.*

If the target can get international assistance, it can easily diminish the damage caused by the sanctions imposed. For example, if the target has an alternative source to overcome the export and import restrictions imposed by the sanction, the goals of senders in sanction cases

to dampen the target cannot easily be accomplished. For example, the US sanctions against Cuba—since 1960—has been understood as a failure, and many people argue that one important reason is the USSR's support for the target country—"[in] 1960, the USSR [began] extensive program of shipping goods, extending credits to Cuba; program lasts into 1980s" (HSE 1990: 318). HSE point out that "countries in distress or experiencing significant problems are far more likely to succumb to the policy objectives of the sender country. When specific goals are at issue, the health and stability of the target country is usually an important determinant in the success of the episode" (1990, 83). This is somewhat proved by the failures of such episodes as the US sanctions against France in 1983 over its nuclear weapons testing and against the USSR over its downing of a Korean Airlines plane. In general, a sanction tends to work if it is imposed on both politically and economically unstable, small target countries in the Third World. HSE also find that sanctions that put a heavy cost on the target are generally successful: "Sanctions that bite are sanctions that work" (102).

The Hypotheses Regarding the Sender/Target Relationship of Sanction

The next two hypotheses are related to the "relationships between sender and target" of economic sanctions.

Hypothesis (Relationship) 18. *The more cordial the relationship between sender and target before the sanction is imposed, the higher the probability of success.*

Hypothesis (Relationship) 19. *The closer the prior trade relationship between the sender and the target, the higher the probability of success.*

"Attack your allies, not your adversaries" is one of the HSE (1990) commandments. A sanction against the target country that has long been an adversary of the sender, or has little trade with the sender, is generally less successful (HSE 1990: 84–86). This is because "[the] higher compliance with sanctions by allies and trading partners reflects their willingness to bend on specific issues in deference to an overall relationship with the sender country" (84). Bergeijk (1989) finds in his models that the trade linkage variable—defined as the sender's trade flows to the target as a percentage of the target's GNP in the year prior to the sanction—has the expected negative coefficient and statistical significance. Drury (1998, 502) argues that higher trade levels lead to higher costs to the target (i.e., more damage to target), and this in turn leads to more effective imposed sanctions. He also argues, however, that when there is international assistance to a target, the positive effect of presanction levels will be mitigated (503).

2. Measurements

The Variables Regarding Time and Type of Sanction

Sanction Duration. To assess the impacts of the duration on the effectiveness of sanctions, I simply use HSE's calculation of the sanction duration by "rounding to the nearest whole year, disregarding the beginning and ending month"; therefore, India's sanctions against Nepal that began in March 1989 and ended in June 1990 is counted as having lasted one year. In the period of my study from 1914 to 1990, the mean duration of the useable 116 cases is 6.25 years with a minimum of 1 year—e.g., the US sanctions against El Salvador in 1987—and a maximum of 44 years—the Arab League's sanctions against Israel since 1946.

Sanctions of Financial Type. When the sender imposes this type of financial sanction, the variable is coded 1; otherwise, 0. There are 86 cases of this type in my database: these cases include financial only as well as financial and export/import.

The Variables Regarding the Sender of Sanction

International Institution as a leading Sender. There have been many sanctions imposed by diverse international institutions, such as the League of Nations, the Arab League, Coordinating Committee on Export Controls (COCOM), China Committee of the Paris Consultative Group (CHINCOM), Organization of African Unity, OECD, and the UN. In these cases, the variable is coded 1; otherwise, 0. There have been 24 cases of this type.

International Cooperation for Sender. This variable measures the degree of cooperation for the leading sender in the sanctions episode. HSE (1990, 34–36) measure this variable using values of 1 ("no cooperation: a single sender country imposes sanctions and usually seeks no cooperation"; e.g., the US sanctions against Brazil in 1962), 2 ("minor cooperation: the sender country enlists verbal support and possibly token restraints from other countries"; e.g., the US sanctions against the USSR in 1981), 3 ("modest cooperation: the sender country obtains meaningful restraints—but limited in time and coverage—from some but not all the important trading partners of the target country"; e.g., the US sanctions against Cuba in 1960), and 4 ("significant cooperation: the important trading partners make a major effort to limit trade, although linkages may still exist through neutral countries"; e.g., sanctions related to World Wars I and II). There have been 53, 28, 20, and 15 sanction cases, respectively (based on the HSE data collection).

*International Institution as a Leading Sender * International Cooperation for Sender.* This interaction variable takes the value of 0 when international institutions were not involved and the values on *Sender Cooperation* when international institutions were involved.

Cost to Sender. HSE (1990, 38–39) attempt to measure the cost to the sender in each sanctions episode. They code the sender cost using four values: 1 for "net gain to sender: usually cases where aid is withheld" (e.g., US sanctions against Sudan in 1989), 2 for "little effect on sender: cases where a trivial dislocation occurs" (e.g., US sanctions against China in 1989), 3 for "modest loss to sender: some trade is lost, but neither the size nor concentration of the loss is substantial" (e.g., US sanctions against Panama in 1987), and 4 for "major loss to sender: large volumes of trade are adversely affected" (e.g., the US and UN joint sanctions against Iraq in 1990). There have been 40 "net gain," 54 "little effect," 16 "modest loss," and 6 "major loss" cases for each value, respectively.

The Variables Regarding the Target of Sanction

International Assistance to Target. This variable is dichotomous. If there was international assistance (overt military or economic aid) to the target, it is coded as 1; otherwise, 0. Among 116 sanction cases, the target could receive international assistance in 27 cases. Recent examples are Libya's assistance to the target in the US sanctions against Panama in 1987 and the USSR's assistance in the US sanctions against Poland in 1981.

Target Conditions. This variable is measured by assessing the overall economic health and political stability of the target country throughout the period of the sanctions case (HSE 1990, 36–7). This variable has three values: 1 for "distress: a country with acute economic problems, exemplified by high unemployment and rampant inflation, coupled with political turmoil bordering on chaos" (e.g., Sudan in the US sanctions of 1989), 2 for "significant problems: a country with severe economic problems, such as a foreign exchange crisis,

coupled with substantial internal dissent" (e.g., Iraq in the US and UN joint sanctions of 1990), and 3 for "strong and stable: a country with the government in firm control and an economy experiencing only the normal range of inflation, unemployment, and small ills" (e.g., China in the US sanctions of 1989). There have been 24 "distress," 52 "significant problems," and 40 "strong and stable" cases of each type, respectively.

Cost to Target. This variable is measured by the annual cost of sanctions to the target as a percentage of its GNP. Based on the HSE collection, the mean of this variable is 1.8%; the minimum is -5.5% (e.g., the US sanctions against Ethiopia in 1976 where Ethiopia gained much more aid and loans from the USSR than it lost from the suspension of US aid and loans). The maximum is 48.0% (the US and U.N. joint sanctions against Iraq in 1990).

The Variables Regarding the Sender/Target Relationship of Sanction

Presanction Relations between Sender and Target. HSE (1990, 37–38) measure this variable of presanction relationship with three values: 1 for "antagonistic: the sender and target countries are in opposing camps" (e.g., the US with Syria in the 1986 sanctions episode); 2 for "neutral: the sender country does not have strong ties to the target," (e.g., the US with Haiti in the 1987 sanctions episode); and 3 for "cordial: the sender and target countries are close friends and allies" (e.g., the US and the United Kingdom with Somalia in the 1988 sanctions episode). There have been 23, 55, and 38 of these sanction cases, respectively.

Economic Difference. This variable is measured as the target's total bilateral trade (exports to and imports from the sender) as a percentage of the target's total world trade.

Appendix B. Frequency Distribution of Each Dichotomous Variable

Variable	Value of 0	Value of 1
Policy Result Dichotomy	59 (50.9%)	57 (49.1%)
Sanction of Financial Type	30 (25.9%)	86 (74.1%)
Sanction against Human Rights	98 (84.5%)	18 (15.5%)
US as a Leading Sender	38 (32.8%)	78 (67.2%)
US Hegemony	68 (58.6%)	48 (41.4%)
US as a Leading Sender * US Hegemony	87 (75.0%)	29 (25.0%)
UK as a Leading Sender	103 (88.8%)	13 (11.2%)
International Institution as a Leading Sender	92 (79.3%)	24 (20.7%)
International Assistance to Target	89 (76.7%)	27 (23.3%)

Appendix C. Descriptive Statistics of Each Variable

Variable	Mean	Standard Deviation	Min	Max
Policy Result	2.58	1.17	1	4
Sanction Duration	6.25	8.78	1	44
International Cooperation for Sender	1.97	1.08	1	4
International Institution as a Leading Sender * International Cooperation for Sender	0.90	1.42	0	4
Cost to Sender	1.90	0.83	1	4
Target Conditions	2.14	0.73	1	3
Cost to Target	1.83	5.13	-5.50	48.00
Presanction Relations between Sender and Target	2.13	0.72	1	3
Economic Difference	568.64	3090.26	0.10	32900.00
Democracy Level of Sender	16.99	6.10	1	20
Democracy Level of Target	7.27	6.66	1	20
Democracy Level of Sender * Dummy Democracy Level of Target	2.01	5.71	0	20

Appendix D. Bivariate Analysis: Statistics for the Differences of Failure and Success Cases with Each Independent Variable (Excluding the Dichotomous Independent Variables)

		N	Mean	Standard Deviation	Standard Error Mean	Test of Mean Difference
Sanction Duration	Failure	59	7.56	10.43	1.36	T: 1.659
	Success	57	4.89	6.47	0.86	Significance: 0.100
International Cooperation for Sender	Failure	59	2.08	1.04	0.14	T: 1.127
	Success	57	1.86	1.11	0.15	Significance: 0.262
International Institution as a Leading Sender * International Cooperation for Sender	Failure	59	0.88	1.39	0.18	T: -0.117
	Success	57	0.91	1.46	0.19	Significance: 0.907
Cost to Sender	Failure	59	1.98	0.84	0.11	T: 1.148
	Success	57	1.81	0.81	0.11	Significance: 0.254
Target Conditions	Failure	59	2.29	0.72	0.094	T: 0.024
	Success	57	1.98	0.72	0.095	Significance: 0.024
Cost to Target	Failure	59	0.79	1.68	0.22	T: -2.226
	Success	57	2.90	6.98	0.92	Significance: 0.030
Presanction Relations between Sender and Target	Failure	59	1.98	0.75	0.098	T: -2.283
	Success	57	2.28	0.65	0.086	Significance: 0.024
Economic Difference	Failure	59	248.27	500.02	65.10	T: -1.118
	Success	57	900.25	4374.02	579.35	Significance: 0.268
Democracy Level of Sender	Failure	57	16.44	6.76	0.89	T: -0.980
	Success	55	17.56	5.33	0.72	Significance: 0.329
Democracy Level of Target	Failure	54	7.14	6.71	0.91	T: -0.195
	Success	49	7.40	6.67	0.95	Significance: 0.846
Democracy Level of Sender * Dummy Democracy Level of Target	Failure	54	2.07	5.85	0.80	T: 0.116
	Success	49	1.94	5.61	0.80	Significance: 0.908

Note: The test of mean differences of two categories (success and failure) was conducted by using the Independent Samples T-Test procedure. If the test result shows significance (say, at the 0.05 level), it means that there is a statistically significant mean difference between two categories.

Appendix E-1. Test Results of Multicollinearity

Multicollinearity refers to "the situation where there is either an exact or approximately exact linear relationship among the *X* variables" (Gujarati 1995: 345). The consequences of multicollinearity are as follows: "If multicollinearity is perfect…, the regression coefficients of the *X* variables are indeterminate and their standard errors are infinite. If multicollinearity is less than perfect…, the regression coefficients, although determinate, possess large errors (in relation to the coefficients themselves), which means the coefficients cannot be estimated with great precision or accuracy" (322). To test whether any serious multicollinearity is present in my equation, I ran auxiliary regressions of my each *X* variables on the remaining *X* variables. The results show that none of R-squares obtained from auxiliary regressions is more than 0.745 (i.e., none of the variation inflation factors is more than 3.922). Therefore, I conclude that there is no serious multicollinearity in my equation and that, consequently, multicollinearity cannot explain the insignificant results in any part of my analysis.

Appendix E-2. Test Results of Heteroskedasticity

Heteroskedasticity is a violation of the important assumption of the classical regression model, homoskedasticity, which refers to "the variation of each disturbance term *ui*, conditional on the chosen values of the explanatory variables, is some constant number equal to [σ-squared]" (Gujarati 1995: 355-356). In the presence of heteroskedasticity, the estimators are not BLUE: even though they can be unbiased and consistent, they are no longer of minimum variance or efficient (389). By inflating the standard errors of regression coefficients, heteroskedasticity can produce a situation in which it is hard to find coefficients that are statistically significant. Given the fact that 14 out of 19 independent variables are statistically insignificant, we can suspect the presence of heteroskedasticity in my equation; however, my test results prove this is not the case. To test whether heteroskedasticity is present in my equation, I used Spearman's rank correlation test. My test results show that there is no sign of heteroskedasticity in my equation (t-statistic is 1.090 with 98 degrees of freedom from the Spearman's rank correlation coefficient of 0.109; see the detailed procedures of applying for this test in Gujarati 1995, 372-374). Therefore, I conclude that there is no heteroskedasticity in my equation and that, as a consequence, heteroskedasticity cannot explain the insignificant results in any element in my analysis.

Appendix E-3. Test Results of Autocorrelation

Autocorrelation (or serious correlation) is a violation of another important assumption of the classical regression model that "the errors or disturbances *ut* entering into the population regression model are random or uncorrelated" (Gujarati 1995: 439). Quite similar to the case of heteroskedasticity, in the presence of autocorrelation, the estimators are not BLUE; even though they can be unbiased and consistent, they are no longer of minimum variance or efficient. Inflating and deflating the standard errors of regression coefficients (negative and positive autocorrelations, respectively) can yield the situation in which the usual t tests of significance of our independent variables are no longer legitimate (439). To test whether autocorrelation is present in my equation, I first took looked at the plot of residuals against a

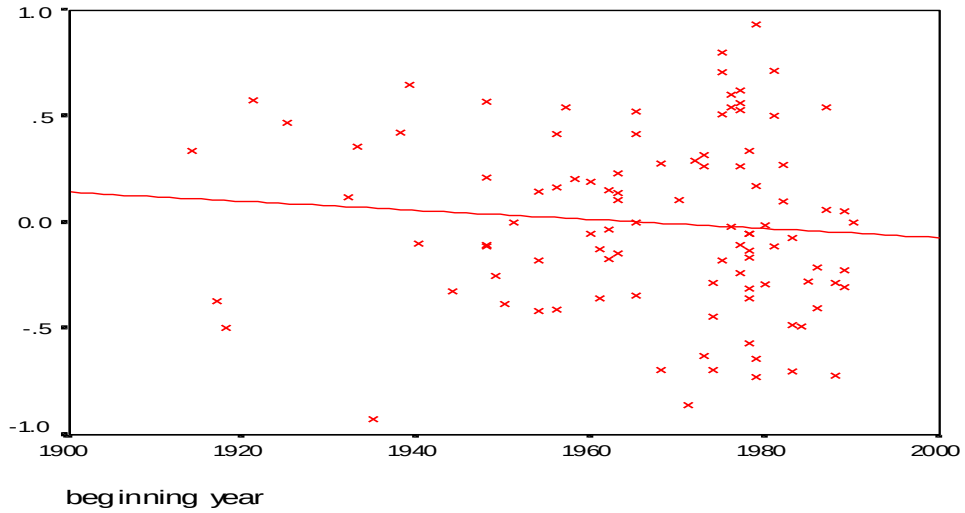

Figure 1. Plot of Residuals against Sanction Beginning Year Variable: No Evidence of Autocorrelation

time variable (the sanction beginning year variable). The plot does not show any systematic pattern, which means that there might be no autocorrelation in my equation (see the below Figure 1).

I conducted the so-called runs test (the Geary test) to ensure the graphical evidence of no autocorrelation. My test results show that I cannot reject the null hypothesis of randomness (i.e., the absence of autocorrelation) with 99% confidence (with total number of observations of 100, number of + residuals of 48, number of - residuals of 52, and the number of runs of 51; see the detailed procedures for applying this test in Gujarati 1995, 419-420). Therefore, I conclude that there is no autocorrelation in my equation; consequently, autocorrelation cannot explain any significant or insignificant results in my analysis.

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