The United States and International Commitments:

Treaties as Signaling Devices

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Rough first draft; comments welcome.

Abstract

Treaties can serve as a costly signal of states’ intent to comply with the terms of international agreements. The choice between treaties and informal executive agreements is therefore a strategic governmental decision. This paper presents a signaling model of treaties. The model implies that high-benefit agreements should more likely take the form of treaties, but that there should not be a consistent relationship between the likelihood that a government is reliable and the chance of a treaty. These propositions are tested on a large dataset of U.S. international agreements between 1980 and 1999. The signaling model receives strong support, while models that do not take into account international strategic interaction do not.
The agreements that states reach with one another can take many different forms. They can be very informal understandings, more formal agreements that require domestic approval, treaties that require explicit legislative ratification, or they may create new organizations. This paper explores a basic distinction, that between informal agreements and treaties. In the United States, informal agreements are generally known as executive agreements. Few explicit rules govern the choice of agreements’ form, so the form that any particular agreement takes is the result of strategic considerations.

Scholars of both international relations (Abbot and Snidal 1998, Lipson 1991) and of American politics (King and Ragsdale 1988, Margolis 1986) have considered why some agreements become formalized. However, the theorizing about this choice has been largely ad hoc, not grounded in any particular theoretical framework or model. Empirical studies have likewise been limited, in particular because the data have been analyzed only at a highly aggregate level. This paper begins to address both of these issues by introducing a game-theoretic signaling model of treaties versus informal agreements, and by analyzing a new data set of nearly 5000 U.S. agreements with other countries.

The question of whether a U.S. international agreement takes the form of an executive agreement or a treaty is quite narrowly focused. However, a general approach to answering this question has direct implications for a range of important issues in international relations. One is the impact of domestic institutions on international cooperation (Milner 1997). If domestic institutions influence patterns of cooperation, and if the choice of domestic institutions is strategic, we should expect to see particular patterns in these choices. In the dataset examined here, the institution under study is the
domestic approval and ratification process. The model presented in this paper asks whether a state will choose to offer a treaty rather than an executive agreement. However, the form of this model is applicable to a wide range of issues in which the decision over the form of an agreement serves as a costly signal of a state’s intent to live up to the terms of that agreement. For example, it could be applied to states’ decisions about delegating authority to international organizations (Nielson and Tierney 2003) or creating an international institution (Koremenos, Lipson, and Snidal 2001), to the extent that such decisions are a signal of state intentions.

The first section of the paper discusses the existing literature on U.S. use of executive agreements and treaties. It then argues that many approaches to the choice of institutions implicitly or explicitly assume that this choice serves a signaling function. The second section presents a simple signaling model of the choice of treaties. This model gives rise to a number of testable comparative statics results. It implies that the likelihood that any particular agreement takes the form of a treaty should increase as the anticipated benefits of the agreement increase. It also implies that the percentage of agreements that take the form of a treaty should not be strongly related to the perceived reliability of the country making the choice of institutional form (assumed here to be the United States). This implication stands in stark contrast to predictions that governments that will have a hard time getting agreements ratified will choose executive agreements over treaties as a way of avoiding domestic opposition. On the international level, such a maneuver would signal a lack of reliability and lead to a failure to conclude any agreement. The third section subjects these implications of the model to a preliminary
test using data on U.S. international agreements between 1980 and 1999. The results support the model.

**Literature and Motivation**

The premise of this paper is that the choice of an international agreement’s form is a strategic, taking into account both domestic and international considerations. This choice is of interest because it tells us something about the general issue of the impact of domestic institutions on patterns of international cooperation, and provides insight into the nature of agreements that structure states’ interactions with one another. The existing literature on U.S. international agreements has, for the most part, looked only at the domestic considerations that go into the choice of form. The model presented here introduces international strategic considerations, and finds that the major expectation derived from the purely domestic perspective cannot be sustained in equilibrium.

In the United States, the choice between executive agreements and treaties lies with the president. As specified in the Constitution, treaties must receive the approval of two-thirds of voting Senators to go into effect. Executive agreements are not mentioned in the Constitution, and can be approved through a number of different mechanisms, from a legislative vote to sole executive approval (Millett 1990). Congress has at times attempted to set binding guidelines for the choice of agreement form, but without success, so this remains a strategic decision by the executive branch.

The literature on executive agreements sees them as a mechanism by which the president can evade legislative constraints, thus as a way for the president to enhance his
dominance over the legislature in foreign affairs. Since executive agreements create binding commitments to other countries (they have the same legal standing as treaties), but do not involve the Senate in its constitutionally-prescribed formal “advise and consent” role, they could be a potent source of executive power. By the 1990s, the president was signing hundreds of these agreements each year, while the number of treaties signed each year is just a couple of dozen (CRS 1993). Nathan and Oliver (1994, 99) summarize the consensus view of American politics scholars about the use of executive agreements: “Presidents … have developed and employed the executive agreement to circumvent Senate involvement in international agreements almost altogether.”

This hypothesis, which I have labeled the “evasion hypothesis” (Martin 2000), implies that executive agreements are a mechanism for evading congressional influence on foreign policy. It has at least one implication that can be tested quantitatively: that when the president expects the most congressional opposition to an international agreement, he should be the most likely to choose an executive agreement rather than a treaty. Thus, we should expect to see a higher percentage of U.S. international agreements taking the form of executive agreements when Congress (or at least the Senate) is in different partisan hands than the presidency, or when the president in general receives low levels of support from Congress.

Martin (2000) has examined the evasion hypothesis and found little support for it. Earlier studies, such as Margolis (1986), claimed to find empirical support, in that the percentage of agreements as executive agreements increased under divided government. However, these studies used crude statistical techniques and no control variables. Martin
(2000) relies on the same aggregate data, a simple count of the number of executive agreements and treaties each year. However, using more appropriate statistical methods and introducing a few controls, she finds that support for the evasion hypothesis disappears.

However, these highly aggregated data do not allow for direct tests of more plausible hypotheses about the choice of institution. Without a data set in which each individual agreement can be coded, we cannot tell what characteristics of particular agreements lead to institutional choice. This paper provides the first test of such micro-level data.

There are many reasons to question the logic of the evasion hypothesis, as simple and compelling as it may appear initially. One difficulty is that most executive agreements do in fact require some legislative action, such as appropriating funds, and thus are not likely to allow the president complete freedom of maneuver. Thus, while they may be less costly in domestic political terms for the president than treaties, executive agreements do provide some constraints. Perhaps more telling, the evasion hypothesis completely neglects the process of negotiation with other countries. Assume that the hypothesis was correct, and that the president used informal agreements to evade legislative opposition. Other states would then see these agreements as a sign of lack of domestic support for the agreement, and would therefore become more reluctant to sign on to it. Signing an agreement that the United States then reneges on can be highly costly for other states. Thus they should follow domestic debates about agreements closely, and take them as signals about the likelihood that the United States will actually live up to the terms of the agreement. From this perspective, the form of an agreement is a signal of
U.S. intentions. While agreements’ form likely has a number of consequences, one of the most important consequences may be its impact on the beliefs of other parties to the agreement. That is, agreements are signaling devices.

The idea that an international agreement can be a signaling device is implicit or explicit in many theories of international relations, even those that are not explicitly strategic. Many theorists refer to the signals that agreements send. For example, Keohane (1984) considers the reputational implications of international commitments. Theorists who focus on the socialization effects of international cooperation also imply that international commitments have a signaling function. They may serve as a signal or expression of a state’s identity (Johnston 2001). While theorists working from a sociological perspective have not been very explicit about the strategic considerations relevant to making international commitments, a model of treaties as signaling devices should have implications for these theories as well as for strategic theories of domestic-international interaction. The following section presents a simple signaling model.

**Model**

As the previous section illustrates, many arguments about the use of formal institutions for international cooperation implicitly or explicitly assume that formality is a signal of intent to comply with the terms of the agreement. If a formal agreement is more costly to sign than an informal one, due to increased ratification costs, it may screen out those states that do not intend to live up to the agreement. This suggests a signaling model of the choice between executive agreements and treaties. This section presents a
model where the United States makes the choice between an executive agreement and a treaty, and another state then decides whether to conclude an agreement with the United States.

Assume a bilateral game, between the United States (US) and another state labeled B. The two states are deciding whether to sign an agreement. If an agreement is completed and US lives up to its terms, it is worth value z to US, and x to B; both z>0 and x>0. At this early stage, I assume that B will always comply with the agreement after signing. However, US may decide not to comply after signing. US can be one of two types: a type that is reliable and will always comply, or a type that is unreliable and will always renege. US is reliable with probability r and unreliable with probability 1-r. US knows its type, but B does not.

Nature moves first and determines US’s type. US then moves, and decides whether to offer B an executive agreement or a treaty. It is more difficult for US to gain approval of treaties than of executive agreements, since treaties need to go through a formal ratification process with a high threshold for legislative approval. Thus, offering a treaty means that US bears a cost. This cost is higher for unreliable than for reliable types. Thus, for a reliable type that completes a treaty with B, the payoff to US is z-b; for an unreliable type it is z-a, with a>b. The cost of offering an executive agreement is normalized to zero, as is the payoff to no agreement for both US and B.

B knows that US is reliable with prior probability r. If B signs an agreement with US but US then reneges, B is left worse off than if it had completed no agreement at all. Thus, B’s payoff to signing an agreement with an unreliable US is –y, with y>0. B observes whether US offers a treaty or an executive agreement, and uses this information
to update its beliefs about the US type. Since treaties are more costly for unreliable than reliable types, under some conditions B will be able to determine from the offer of a treaty or an executive agreement whether it should go ahead and sign. Under other conditions, the US action provides no information.

The equilibria of this game are shown in Table 1. Proof of the equilibria are on Appendix 1. Equilibrium strategies are determined by two key parameters: the potential benefits of the agreement to US (z), and the prior probability that US is reliable (r). When benefits are low and reliability is low, no agreements are reached. When benefits are low and reliability is high, all agreements take the form of executive agreements. When benefits are in an intermediate range, reliable types are able to fully differentiate themselves from unreliable types, since it is worthwhile for them to offer treaties, but not for unreliable types. So here we find that reliable types offer treaties and unreliable types do not. B signs all treaties but no executive agreements in this intermediate range.

When the potential benefits of an agreement are high, equilibrium strategies get more complex. Reliable types always offer treaties in this high-benefit region. When benefits are high and the probability of reliability is also high, it is worthwhile for unreliable types to always bluff by offering treaties, and for B to sign all treaties. In practice, this is the region in which we would observe US reneging on signed treaties. When benefits are high but reliability is low, unreliable types have an incentive to bluff with some probability less than one. Thus reliable types cannot fully distinguish themselves, and B decides probabilistically whether to sign any treaties that are offered. B does not sign any executive agreements, and refuses to sign some treaties. This is the
only region in which we would see B declining to sign some treaties; we would also see US reneging on some signed treaties here.

Table 2 shows how these equilibrium strategies will translate into observed patterns of no agreements, executive agreements, and treaties. The only time that signed executive agreements will be observed is when benefits are low and reliability is high. The high proportion of U.S. agreements that take the form of executive agreements thus implies that the United States is generally reliable (at least relative to the potential benefits of agreements to other states), and that many international agreements are of relatively low value to the U.S. Both claims seem highly plausible.

[Tables 1 and 2 about here]

The following comparative statics can be derived from this model. I highlight those that I go on to test in the following section.

1. The percent of agreements that take the form of treaties increases as the benefit of an agreement to US grows.¹

2. There is no relationship between the probability that US is reliable and the percentage of agreements that take the form of treaties, unless the benefits to US are very high. When benefits to US are high, the percentage of agreements that take the form of treaties is an increasing function of the probability that US is reliable.

3. When the probability that US is reliable is low, no executive agreements will be concluded.

¹ Strictly speaking, this statement is not quite accurate when the probability of US being reliable is low. Here, we either see no agreements (when benefits to US are low) or a mix of treaties and no agreements; no executive agreements are signed in equilibrium. So the percent of total agreements as treaties may not vary for low reliability conditions; however, this case appears less relevant than higher reliability conditions.
4. As the costs to B of signing an agreement with an unreliable US increase, we will observe fewer total agreements signed and a higher proportion of agreements as treaties.

5. As the benefits to B of signing an agreement with a reliable US increase, we will observe more total agreements and a higher proportion as executive agreements.

6. For a reliable US, the total number of agreements should be a nonlinear function of their potential benefits to US, taking on a U shape.

I will focus on the first two implications here. They follow from an inspection of Table 2. Focusing first on the right column, where reliable types are common, we see a straightforward positive relationship between the benefits to the United States and the probability that any particular agreement will take the form of a treaty. When benefits are low, all agreements will take the form of executive agreements. When benefits increase, all completed agreements will take the form of treaties. This column seems the most relevant for our empirical analysis, as it is the only column where executive agreements will be observed in equilibrium, and we observe a large number of executive agreements.

Implication 2 states that there is no straightforward relationship between the probability that the United States is reliable and the percentage of agreements that take the form of treaties. This stands in contrast to the claims of previous analyses that see executive agreements as a mechanism by which the president can evade opposition in the Senate. If in fact informal agreements are only meant to evade legislative opposition, other countries should be unwilling to sign them in many circumstances. Thus taking into account strategic interaction on the international level calls into question models that
consider only U.S. domestic politics. The next section tests implications one and two quantitatively.

**Data**

The dataset analyzed here contains 4955 international agreements signed by the United States between 1980 and 1999. The data were obtained from Oceana, a firm that collects such data for the use of lawyers. While perhaps not a fully comprehensive list, Oceana claims that it includes all significant agreements signed during those years. Oceana indicates the country, countries, or international organization that completed the agreement, its subject, and whether the agreement took the form of a treaty. Just over four percent of the agreements in this dataset are treaties. I have supplemented these data with data on the countries involved and the political context in the United States.

The agreements in the data set cover all issue-areas. They range from fairly routine scientific and cultural understandings to major military and economic agreements. About 16.1% of the observations are military agreements. 13.4% are trade agreements, 8.6% finance, and 11.7% other economic agreements. Another large economic category is agreements relating to agriculture and commodities, accounting for 8.0% of the total.

The signaling model suggests two hypotheses that I test using these data. The first is that the probability that an agreement takes the form of a treaty should increase as the agreement becomes more valuable to the United States. The second is that, contrary to claims by advocates of the evasion perspective, there should be no consistent relationship
between the existence of divided government and the probability that an agreement takes
the form of a treaty.

Of course, measuring the value of an agreement to the United States is not easy. Here, I suggest two proxies. One is whether the agreement is multilateral. On average, multilateral agreements should be higher value than bilateral agreements. This is not to deny that some bilateral agreements are of great value. However, it seems reasonable to assume that generally speaking agreements with more countries provide greater benefits than those with just one country. Approximately 7.4% of the agreements in this data set are multilateral. The second proxy is the per capita GDP of the country that the agreement is with. Focusing on bilateral agreements, it seems likely that agreements with richer countries are on average of more potential benefit to the United States than those with poor countries.

I include two other variables as controls. One is the party of the president. This allows for the possibility that, even controlling for divided government, one party is inclined to sign more treaties than the other. I also control for whether an agreement is with an international organization.

[Table 3 about here]

Table 3 presents results of rare-events logit estimations. Rare-events logit is the appropriate method to use as treaties are rare events in this dataset; that is, the dependent variable is unbalanced (Tomz, King, and Zeng 1999). However, the results are identical in both substance and statistical significance to those using standard logit. The dependent variable is the probability that any particular agreement is a treaty. Multilateral is a dummy variable indicating whether an agreement is multilateral. IO is another dummy,
indicating whether the agreement is with an international organization. Republican
president is a dummy, coded one if the president is a Republican (about 60% of the time
in these years). Divided government is a dummy, coded one if the Senate is controlled by
a different party than the presidency. During this period, if the Senate was controlled by
a different party, so was the House. Per capita GDP is a purchasing-power-parity
measure in constant dollars. Descriptive statistics are in Appendix 2. None of the
explanatory variables are correlated above 0.20, so multicollinearity is not a concern.

Models 1 and 2 in Table 3 present results using the multilateral agreements
indicator for the benefit of an agreement to the United States. Model 1 includes all
observations. Model 2 eliminates science and cultural agreements, which never take the
form of treaties in this data set. Substantively, this makes no difference in the results.
The results are as predicted on multilateral agreements. They strongly increase the
probability that an agreement will be a treaty. For a Democratic president facing a
Democratic Senate, moving from a bilateral to a multilateral agreement will increase the
probability that it is a treaty from 4.5% to 30.9%.

The other explanatory variable of most interest is divided government. The
evasion perspective expects a negative coefficient on this variable, as presidents facing a
Senate controlled by the other party will be more likely to use executive agreements.
Surprisingly, we find a positive and statistically significant coefficient on divided
government. Divided government seems to increase the probability of a treaty from 4.5%
to 6.1%. However, as we will see in the rest of the results, this finding is not stable.

Agreements with international organizations are less likely than other agreements
to take the form of treaties. If the agreement is with an IO, the probability of a treaty
decreases from 4.5% to 0.2%. We also find that Republican presidents are significantly less likely to use treaties. Having a Republican president reduces the chance of a treaty from 4.5% to 1.7%.

Models 3 and 4 look only at bilateral agreements, so that we can introduce a measure of the wealth of the country signing the agreement with the United States. Model 4 again eliminates science and culture agreements, with no impact on the results. As expected, we find that agreements with wealthier countries are more likely to take the form of treaties. Again taking the baseline of a Democratic president facing a Democratic Senate, consider moving from a country with its per capita GDP at the 20th percentile to one at the 80th percentile. The chance that an agreement will be a treaty will increase from 4.0% to 5.9%. Substantively this is smaller than the effect of multilateral agreements, but it is significant. Also as expected, divided government has no effect in this specification. The effect of Republican presidents remains the same.

[Table 4 about here]

In order to give the evasion perspective a further test, I introduce an alternative measure of support for the president in Table 4. Here, I measure presidential victories on votes in the Senate. The variable is a percentage, based on the number of Senate votes supporting the president divided by the total number of votes on which the president had taken a position. Not surprisingly, this indicator is highly correlated with the divided government indicator, so they cannot both be entered in the same specification. As the signaling model predicts, this variable has no effect. Presidents are not able to use executive agreements to circumvent Senate opposition, as this would send a signal of unreliability to U.S. agreement partners.
I have run logit specifications using additional variables that other authors have suggested might have an impact. For example, presidents in their first year in office might have a hard time getting treaties signed; they might also turn to executive agreements in election years in order to create an image of foreign-policy activism. Neither of these indicators has any effect. I have also controlled for other aspects of the country involved, such as its regime type and whether it has a military alliance with the United States. None of these variables have any systematic effect. Overall, it appears that the expectations of the signaling model are the only propositions to receive strong, consistent support in this large data set.

Summary

Why are some international agreements informal, and others formal treaties? Authors have offered various answers to this question, but none have integrated the domestic and international levels of strategizing that governments must undertake. I suggest that one mechanism for thinking about the strategic problem, as well as for integrating various theoretical perspectives, is to consider a treaty a costly signal of intent to live up to its terms. Under some conditions, governments that intend to comply with a treaty will be willing to bear the higher costs of getting it ratified, thus distinguishing themselves from governments that do not intend to comply.

A signaling model of treaties implies that treaties should be more likely on high-benefit agreements, since governments will then be willing to bear the costs of signaling
their reliability. On the other hand, we should not expect a consistent relationship between the reliability of a government and the percentage of agreements that take the form of treaties. Unreliable governments cannot simply turn to executive agreements to evade domestic opposition, as this sends a signal of unreliability. Thus the conventional wisdom that presidents facing partisan opposition will more frequently use executive agreements is called into question when we consider the international strategic problem.

These hypotheses were tested on a new dataset of nearly 5000 agreements signed by the United States between 1980 and 1999. The implications of the signaling model hold up well, with proxies for high-benefit agreements having positive and significant effects. On the other hand, as expected, we find that indicators of the reliability of the government had no consistent effect. We also find that Republican presidents are less likely to sign treaties than Democrats, even after controlling for divided government, and that agreements with international organizations are unlikely to take the form of treaties.

This research has implications for the study of the role of domestic institutions in international cooperation. Most studies of this topic have treated domestic institutions as exogenous, asking about their impact on patterns of cooperation (see, for example, Schultz 1999). However, the form of an agreement is an important domestic institution, and at least in the case of the United States it is not exogenous. It is instead a strategic choice made by the president under the constraints created by international bargaining. The analysis in this paper suggests that the choice of domestic institutions is driven, at least in part, by what this choice signals to negotiating partners. Governments that care about international agreements and that intend to live up to their terms can, under some conditions, choose domestic institutions to signal this intent. However, under other
conditions reliable governments cannot differentiate themselves from unreliable ones through institutional choice, and some mutually-beneficial international agreements are therefore never reached. International cooperation can be inefficient.


### Table 1

**Equilibria of Signaling Game**

<table>
<thead>
<tr>
<th>Benefits of potential agreement to US (z)</th>
<th>r&lt;y/(x+y)</th>
<th>r&gt;y/(x+y)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>r&gt;a</strong>: Benefits greater than cost of treaty for both types</td>
<td>Semi-separating equilibrium: Reliable types always offer treaties, Unreliable types offer treaties with probability (xr/(y(1-r))). B signs the agreement only if a treaty is offered, then with probability (a/z).</td>
<td>Pooling equilibrium: All types offer treaties. B signs all agreements.</td>
</tr>
<tr>
<td><strong>a&gt;z&gt;b</strong>: Benefits greater than cost of treaty for reliable but not unreliable types</td>
<td>Separating equilibrium: Reliable types offer treaties, Unreliable types offer executive agreements. B signs only treaties.</td>
<td>Separating equilibrium: Reliable types offer treaties, Unreliable types offer executive agreements. B signs only treaties</td>
</tr>
<tr>
<td><strong>z&lt;b</strong>: Benefits less than cost of treaty for all types</td>
<td>Pooling equilibrium: All types offer executive agreements. B does not sign any agreements.</td>
<td>Pooling equilibrium: All types offer executive agreements. B signs all agreements.</td>
</tr>
</tbody>
</table>

Parameters: \(z\) is the value of the agreement to US; \(x\) is the value of the agreement to B; \(r\) is the prior probability that US is reliable; \(a\) is the cost to an unreliable type of offering a treaty; \(b\) is the cost to a reliable type of offering a treaty; \(y\) is the cost to B if US reneges on the agreement.
Table 2

Pattern of Treaties and Executive Agreements in Equilibrium

<table>
<thead>
<tr>
<th>Benefits of potential agreement to US (z)</th>
<th>Probability that the US is reliable (r)</th>
<th>( r &lt; \frac{y}{x+y} )</th>
<th>( r &gt; \frac{y}{x+y} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits greater than cost of treaty for all types</td>
<td>( z &gt; a );</td>
<td>Mix of treaties (with probability ( r^2 \frac{x}{a} \frac{y}{yz} )) and no agreements</td>
<td>All treaties</td>
</tr>
<tr>
<td>Benefits greater than cost of treaty for reliable but not unreliable types</td>
<td>( a &gt; z &gt; b );</td>
<td>Mix of treaties (with probability ( r )) and no agreements</td>
<td>Mix of treaties (with probability ( r )) and no agreements</td>
</tr>
<tr>
<td>Benefits less than cost of treaty for all types</td>
<td>( z &lt; b );</td>
<td>No agreements</td>
<td>All executive agreements (no treaties)</td>
</tr>
</tbody>
</table>

Parameters: \( z \) is the value of the agreement to US; \( x \) is the value of the agreement to B; \( r \) is the prior probability that US is reliable; \( a \) is the cost to an unreliable type of offering a treaty; \( b \) is the cost to a reliable type of offering a treaty; \( y \) is the cost to B if US reneges on the agreement.
### Table 3

**Rare Events Logit Results**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-3.06**</td>
<td>-2.91**</td>
<td>-3.25**</td>
<td>-3.12**</td>
</tr>
<tr>
<td></td>
<td>(0.121)</td>
<td>(0.122)</td>
<td>(0.169)</td>
<td>(0.167)</td>
</tr>
<tr>
<td>Multilateral</td>
<td>2.26**</td>
<td>2.20**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.180)</td>
<td>(0.183)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IO</td>
<td>-3.53**</td>
<td>-3.54**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.03)</td>
<td>(1.032)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Per capita GDP</td>
<td></td>
<td></td>
<td>0.0000410**</td>
<td>.0000465**</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.0000123)</td>
<td>(0.0000122)</td>
</tr>
<tr>
<td>Republican</td>
<td>-1.01**</td>
<td>-1.09**</td>
<td>-1.055**</td>
<td>-1.16**</td>
</tr>
<tr>
<td>president</td>
<td>(0.161)</td>
<td>(0.156)</td>
<td>(0.208)</td>
<td>(0.210)</td>
</tr>
<tr>
<td>Divided</td>
<td>0.330*</td>
<td>0.383*</td>
<td>0.118</td>
<td>0.136</td>
</tr>
<tr>
<td>government</td>
<td>(0.160)</td>
<td>(0.163)</td>
<td>(0.203)</td>
<td>(0.207)</td>
</tr>
<tr>
<td>N</td>
<td>4955</td>
<td>4405</td>
<td>3912</td>
<td>3495</td>
</tr>
</tbody>
</table>

Estimated using the relogit command in Stata 6.0. Coefficients with two asterisks indicate statistical significance at the .01 level; coefficients with one asterisk indicate statistical significance at the .05 level. Robust standard errors in parentheses. Models 2 and 4 omit Science and Culture agreements. Models 3 and 4 omit multilateral agreements and agreements with international organizations.
### Table 4

**Rare Events Logit Results, Alternative Measure of Presidential Support**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-2.419**</td>
<td>-3.495**</td>
</tr>
<tr>
<td></td>
<td>(0.3969)</td>
<td>(0.6251)</td>
</tr>
<tr>
<td>Multilateral</td>
<td>2.262**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.1800)</td>
<td></td>
</tr>
<tr>
<td>IO</td>
<td>-3.521**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.025)</td>
<td></td>
</tr>
<tr>
<td>Per capita GDP</td>
<td></td>
<td>0.000448**</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(.0000125)</td>
</tr>
<tr>
<td>Republican president</td>
<td>-0.9700**</td>
<td>-1.016**</td>
</tr>
<tr>
<td></td>
<td>(0.1534)</td>
<td>(0.2051)</td>
</tr>
<tr>
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<td>(0.00739)</td>
</tr>
<tr>
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Estimated using the relogit command in Stata 6.0. Coefficients with two asterisks indicate statistical significance at the .01 level; coefficients with one asterisk indicate statistical significance at the .05 level. Robust standard errors in parentheses.
Appendix 1
Equilibria of model

I solve for a Bayesian perfect equilibrium. B believes that US is reliable with prior probability r. B observes whether US offers a treaty and uses this information to update its belief about US’s type using Bayes’ Rule.

*Pooling equilibrium, all offer treaty:* A pooling equilibrium exists if all US types offer a treaty and if B always chooses to sign a treaty. In this case, the offer of a treaty conveys no information to B, so B does not update its beliefs about US’s type. The value to B of signing a treaty in this case is \( rx + (1-r)(-y) \). B will sign if this is greater than the value of no agreement, 0. So B will sign if \( r > y / (x+y) \). Given this strategy, an Unreliable type will receive the payoff \( z-a \) from offering a treaty. So an Unreliable type will offer a treaty if the payoff is greater than 0, or \( z > a \). In this case, the Reliable type receives a payoff of \( z-b > 0 \) for offering a treaty, so all types will offer a treaty. So a pooling equilibrium where all types offer a treaty exists if \( z > a \) and \( r > y / (x+y) \).

*Pooling equilibrium, no types offer treaty:* Another pooling equilibrium exists if no types find it worthwhile to bear the costs of offering a treaty. A Reliable type is not willing to bear these costs if \( z < b \); then getting no agreement is preferable to a treaty. In this case, all US types offer executive agreements. This conveys no information to B, and B does not update its beliefs about US’s type. So B is willing to sign the agreement if the expected payoff, \( rx + (1-r)(-y) > 0 \); \( r > y / (x+y) \). So a pooling equilibrium exists if \( z < b \). If \( r < y / (x+y) \), we observe no agreements; if \( r > y / (x+y) \) we observe all executive agreements. This is the only equilibrium in which executive agreements are signed,
where the benefits of the agreement to US are low and the probability that US is reliable is high.

The pooling equilibrium where no agreements are signed is inefficient. Here, there are potential agreements between Reliable types and B that would benefit both, but that are not achieved in equilibrium. The existence of many Unreliable types means that it is not worthwhile for Reliable types to attempt to differentiate themselves, given the relatively low benefits of potential agreements.

Separating equilibrium: A separating equilibrium exists if Reliable types are willing to offer a treaty but Unreliable types are not. This occurs when \( z \) takes on an intermediate value, \( a > z > b \). In this case, the signal tells B with precision US’s type. So B will sign treaties when they are offered, but not executive agreements. Given B’s strategy, does an Unreliable type have an incentive to bluff? No, because even if a treaty is completed, the benefits \( z \) are less than the cost \( a \) to this type.

Semi-separating equilibrium: When the benefits of the agreement are high (\( z > a \)), but the chance that US is reliable is low (\( r < y/(x+y) \)), neither a pooling nor a separating equilibrium can exist. The pooling equilibrium where all offer treaties cannot exist, because the expected payoffs to signing a treaty are too low to B, given the high probability that US is unreliable. Thus US does not have an incentive to always offer treaties, in spite of the high potential benefits, because they will not be signed. A separating equilibrium cannot exist, because Unreliable types have an incentive to bluff. The benefits of the agreement are high enough to encourage an Unreliable type to offer a treaty if it will be accepted, as in a separating equilibrium. But we have established that
treaties will not be accepted when \( r < \frac{y}{x+y} \) unless the choice of the agreement’s form provides some information about US’s type.

So with high benefits and low reliability, the only equilibrium that can exist requires that Unreliable types randomize and offer a treaty with probability \( 0 < q < 1 \). Reliable types will always offer a treaty. B will observe whether a treaty is offered and update its beliefs about US’s type using Bayes’ Rule. B will never sign if an executive agreement is offered. If a treaty is offered, B will sign with probability \( 0 < s < 1 \).

B will choose \( s \) so as to make Unreliable types indifferent between offering a treaty and offering an executive agreement. Unreliable types’ expected payoff from offering a treaty is \( s(z-a) + (1-s)(-a) \); the payoff from offering an executive agreement is 0. So an Unreliable type is indifferent when \( s = a/z \).

Unreliable types will choose \( q \) so as to make B indifferent between signing and not signing. If B observes a treaty, B’s updated belief that US is reliable is \( r/(r+q(1-r)) \). B’s updated belief that US is unreliable is \( q(1-r)/(r+q(1-r)) \). So B’s payoff from signing after observing a treaty is \( xr/(r+q(1-r)) - yq(1-r)/(r+q(1-r)) \). B will be indifferent between signing and not signing when this is equal to the value of no agreement, 0. So B will be indifferent when \( q = \frac{xr}{y(1-r)} \).

Thus, in the semi-separating equilibrium, Reliable types offer treaties with probability 1. Unreliable types offer treaties with probability \( q = \frac{xr}{y(1-r)} \). B does not sign if an executive agreement is offered; if a treaty is offered, B signs with probability \( s = \frac{a}{z} \).

Given B’s strategy, will the Reliable type be tempted to save the costs of a treaty by sometimes offering an executive agreement? No, because this increases the
probability that no agreement will be signed, which can only reduce the Reliable type’s payoff when \( z > a \).

This equilibrium is also inefficient. Some treaties that are offered by Reliable types are turned down by B, to the detriment of both. Reliable types cannot fully differentiate themselves from Unreliable types because the high benefits of an agreement to US make it worthwhile for Unreliable types to sometimes bluff.
## Appendix 2

### Descriptive statistics and data sources

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