Abstract

We model the domestic implications of aid-for-policy deals both in the presence of and in the absence of rival aid donors. The model indicates that a dominant donor captures all the surplus from any deal. When there are rival donors, recipients can extract greater amounts of aid while granting smaller policy concessions. When potential donors are outbid by a rival donor, the losing bidders are incentivized to collaborate through the formation of a multinational aid organization. We test several hypotheses that follow from the model, demonstrating that the US paid less (in constant dollars) and gained more in policy terms through aid before the Soviet Union became a significant aid player and that once the Soviet’s were in the aid picture, the US paid more for aid and got less by way of security concessions from recipients.
1 Introduction

“We shall never agree to friendship through any form of bribery. And I want all those nations who are present today—whether from West or from East—to understand our aim. We want to befriend all, and we want aid from everyone. But we do not want assistance from any person or country who will say: Kenyatta, if you want aid, you must agree to this or that. I believe, my brothers, and I tell you now, that it is better to be poor and remain free, than be technically free but still kept on a string. A horse cannot choose: reins can be put on him so he can be led around as his owner desires. We will not be prepared to accept any aid that will tie us like a horse by its reins.” Jomo Kenyatta, Kenyan Independence Day speech in 1963

As the quotation from Jomo Kenyatta indicates, he was aware of two crucial facts about foreign aid: donors hope to secure concessions from recipients in exchange for aid money and recipients have leverage because donors can be made to compete for the recipient’s acceptance of aid. Curiously, despite the extensive empirical and theoretical research into foreign aid, there appears to be no formal analysis of aid giving in a competitive donor environment of the sort recognized by Jomo Kenyatta. We attempt to address this lacuna by expanding earlier selectorate-based models of foreign aid to include the natural environment of multiple donors bidding for concessions from an aid recipient. As we will show, inclusion of multiple prospective aid donors results in diminished policy concessions; circumstances in which donors prefer to encourage democratization by recipients; and conditions under which donors with complementary interests have incentives to form multilateral aid agencies rather than compete with each other. The new model introduces results that meaningfully modify our understanding of aid-for-policy deals.

We explore aid-for-policy deals between potential donor nations, labelled A, B, and C, and a target nation T. The donors offer aid-for-policy deals that specify a desired policy $y$ and the aid resources $r$ they are prepared to transfer to compensate T for its policy concession. If T agrees to a deal, then T shifts its policy and receives the aid. We extend Bueno de Mesquita and Smith (2009a) to allow for multiple bidders. The underlying theme of the model is domestic politics which we analyze using the selectorate framework (Bueno de Mesquita, Smith, Siverson and Morrow 2003). Each nation has a political leader. To survive in office, leaders depend upon a coalition of supporters and, to maintain their loyalty, leaders maximize coalition welfare. Citizens in each nation care about a policy or policies adopted in nation T and the private rewards they receive. By inducing the leader in T to accept an aid-for-policy deal, leader A can improve policy benefits from the perspective of her supporters. However, in making such a deal leader A gives up resources with which she could otherwise have rewarded her backers. Hence the policy benefits gained by a leader’s coalition through aid must be sufficient to compensate for the benefits they
forego when \( r \) is not distributed directly to them. Domestic institutions, in particular the size of the winning coalition, affect this tradeoff between spending \( r \) at home on the coalition versus spending \( r \) on \( T \) in exchange for policy concessions. In large coalition systems, such as in democracies, each supporter’s claim on private goods is small because a leader needs to share resources over many people. For leaders in such systems, aid-for-policy deals are an attractive means to maintain coalition loyalty. Leaders of small coalition systems, such as monarchies, juntas and autocracies, are best able to trade their nation’s policy in exchange for aid. Although each supporter in the targeted recipient nation is worse off due to the policy concession his government grants, in small coalition systems these supporters are readily compensated because the aid resources need only be shared by the few backers who make up the winning coalition.

The model examines a single target recipient, \( T \). Obviously in reality there are many potential targets. If there are elements of complementary or substitutability between the concessions the donors seek from different targets, then the deal struck by a donor with one target will affect the bargaining with another target. However, as we discuss later, in the absence of such idiosyncratic policy correlations the deals donors strike with different targets can be treated as independent.

A dominant donor offers just enough aid to compensate the supporters in the target state for the policy concessions sought. A dominant donor exists under either of two circumstances: 1) there is only one donor, or 2) there are other donors but they are much less motivated and also so much poorer that they can not compete. We investigate how aid-for-policy deals vary according to whether there is a dominant donor or not. When there is a dominant donor, the gains from such aid-for-policy deals are captured by the donor state. The introduction of a rival donor, one that wishes to move policy in the opposite direction to the first donor, means the first donor must pay more for its desired policy concession. No longer does a donor merely need to compensate the supporters in the target for their policy concession. With a competitor, the deal that is offered needs to be more attractive to the prospective recipient than the deal that the rival proposes. Consequently, the presence of rival donors reduces the size of policy concessions and means donors must pay more for the policy concessions they buy than would have been true if there were no alternative bidder.

The impact that multiple prospective donors can have is not simply to increase aid costs and diminish concessions. There is, not surprisingly, a critical distinction between the presence of a rival donor; that is for instance, a donor \( B \) that seeks policy concessions contrary to those desired by donor \( A \), and the existence of a donor \( C \) whose policy interests are aligned with \( A \)’s. In the absence of rival donors, the introduction of additional potential donors with similar policy preference to the dominant donor has little impact. These non-rival donors are uninterested in collaborating with the original donor. They prefer to free-ride on the original donor’s policy purchases. However, collaboration becomes attractive if there is a
powerful rival donor that seeks to shift policies in an undesirable direction. By forming a multinational aid organization, nations with similar interests can collaborate to outbid rivals that could not be beaten unilaterally.

The donor environment – whether competitive or not – also shapes donor interest in the nature of the political institutions within recipient states. Particularly, the number, motivation and resources of potential donors modifies their induced preferences regarding the institutions within recipient states. In a single bidder situation, where there is a single dominant donor, that donor prefers that aid recipients remain poor and autocratic. This configuration allows the donor to obtain large concessions in exchange for relatively little aid while managing to improve each leader’s political survival. However, the presence of rival bidders inverts the induced institutional preference of donors. As we will see, when nations compete to buy policy concessions, donors prefer that the targeted recipient democratize. As coalition size increases in $T$, each donor moderates her policy demands and defuses the intense bidding battle to buy policy. The upshot is that if the rival bidder prevails, the democratized recipient’s policies shift less than would have been true if their coalition were small and so the losing bidder is less harmed by failure. The successful bidder may also prefer that $T$ democratize since the reduced policy concession translates into a low price, all else being equal.

After reviewing the relevant literature on aid motivations and bargaining, we introduce the model and demonstrate that each of the above claims is a characteristic of equilibrium behavior. The analysis starts with the single bidder case, moves then to bidding between two prospective donors with opposite policy interests and then turns to an environment with three bidders, two with complementary interests and one whose interests are antithetical to the others. We then present an empirical assessment of some of the model’s novel predictions.

2 Literature Review

The literature is extensive regarding questions about who gives aid to whom and how much aid is given (Alesina and Dollar 2000; Cingranelli and Pasquarello 1985). There also is substantial research into the efficacy of aid. The efficacy question is typically posed in terms of how successful aid is in alleviating poverty or promoting economic growth (Burnside and Dollar 2000; Boone 1996; Easterly 2002; Sachs 2006). Here we narrow the focus to consider the efficacy of aid in Jomo Kenyatta’s terms: how much can a recipient extract in exchange for how small a set of concessions it must give donors.

Morgenthau argues that until the nineteenth century bribery was a standard means of conducting foreign policy. He argues little has changed: “[m]uch of what goes by the name of foreign aid today is in the nature of bribes” (1962, p. 302). Of course, it is possible that aid motivations have changed since
Morgenthau wrote these words. Indeed, some scholars argue, for instance, that aid giving is driven by humanitarian concerns, particularly amongst Scandinavian countries, (Lumsdaine 1993; Noel and Thérien 1995); others refute this claim. For instance, Schraeder, Hook and Taylor (1998) show that trade and socialist policies determine Swedish aid. Tan (2015) contends that most aid is aimed at influencing security or commercial policies but that recipients with low value on these dimensions often receive aid in exchange for political liberalization. The consensus opinion appears to be that both strategic and humanitarian concerns are present in the pattern of aid flows (see Neumayer (2005) for a survey). McKinlay and Little (1978, 1977) find strategic concerns drive US and British bilateral aid flows and that the most needy states do not receive the most humanitarian aid. Derouen (2004) finds that the US uses aid to reward nations that adopt policies similar to those favored by the United States government. Meernik, Krueger and Poe (1998) show that US interests dominate US aid giving both during and after the Cold War, although the end of the Cold War resulted in a shift in what those interests are. Numerous studies examine aid-for-policy deals in terms of shifting support at the United Nations in either General Assembly voting (Rai 1980; Dreher, Nunnenkamp and Thiele 2008) or in terms of preferential treatment of nations elected to the UN Security Council (Kuziemko and Werker 2006; Vreeland and Dreher 2014). Milner and Tingley (2010) find, at least in the US, that the provision of aid is driven by the interests of individual legislators based on the political economy of their districts. In parallel to our empirical approach, Bermeo (2015) examines how the composition of aid and the amount of aid given varies across different time periods.

Aid affects the tenure of leaders and the longevity of regimes. Bader and Faust (2014) summarize the literature on how aid affects democratization and the survival of political leaders. Knack (2001) finds that high aid flows undermine democracy. However, in subsequent work he finds aid can benefit democratization under specific circumstances (Knack 2004). Studies that focus explicitly on aid given to promote democratization generally find that such aid succeeds in its stated goal (Finkel, Pérez-Liñán and Seligson 2007; Tan 2015). Dutta, Leeson and Williamson (2013) find that aid amplifies the features of existing institutions, so starting conditions shape the effects of aid flows. Likewise, Wright (2009); Licht (2010); Cornell (2013); Bueno de Mesquita and Smith (2010) find that the impact of aid on leader survival and on democratization depends upon existing institutions. Morrison (2007); Ahmed (2012); Bueno de Mesquita and Smith (2010, 2009b) argue that such sources of government revenue as aid that do not require the taxation of productive activities strengthen autocracy and undermine democratization. Bermeo (2011) finds that the domestic institutions of the donor have an important modifying effect.

Political leaders clearly have much at stake from the allocation of aid, yet compared to questions of aid effectiveness, the literature on bargaining over aid flows appears underdeveloped. Schneider and Tobin (2011) examine competing means of allocating aid, arguing that donors resort to third party
agencies, such as NGOs, when recipients lack capacity or are likely to renege on agreements. Schneider and Tobin (2013) examine multilateral aid donations and report that coalitions of nations form around coherent interests, effectively lobbying for aid allocations directed at these shared interests. This result is consistent with other works that find multilateral aid follows the interests of powerful member nations (Stone 2004; Thacker 1999); when preferences diverge then donors go it alone (Copelovitch 2010; Nielson and Tierney 2003; Hawkins, Lake, Nielson and Tierney 2006).

In terms of direct bargaining between donors and recipients, Bueno de Mesquita and Smith (2009a, 2007) model aid-for-policy deals in terms of domestic politics. Their models provide the launching pad for the model developed here. We examine the impact of multiple donors competing or collaborating to make aid-for-policy deals. Roeder (1985); Lundborg (1998); James and Imai (1996) explore contests between the Soviet Union and the United States during the Cold War and find that each side tried to buy influence. It is precisely this form of competition that we seek to model.

3 Model of Aid-For-Policy Deals

We adopt a simple version of selectorate domestic politics. In nation \( i \) the leader has \( R_i \) resources and a coalition of size \( W_i \). The leader in nation \( T \) sets a policy on some policy dimension: \( y \in [0, 1] \). Although the policy is picked by the leader in nation \( T \), we assume the people in each nation (or more specifically supporters of the leader) care about the policy. In particular, we assume the ideal points of people in nations \( A, B, C \) and \( T \) are \( x_A, x_B, x_C \) and \( x_T \) respectively and preferences over policy are quadratic. The salience of the policy dimension in nation \( i \) is \( \sigma_i \). The policy-related payoff associated with policy \( y \) for people in nation \( A \) is \( -\sigma_A(y - x_A)^2 \), with analogous specifications for the other nations.\(^1\)

In addition to rewards associated with the policy dimension, supporters of incumbent leaders enjoy private goods allocated by their leaders. Supporters have a utility function for these private goods, \( z \), \( u(z) \) that is smooth, increasing and concave. The model examines the possibility of aid-for-policy deals. The game proceeds as follows:

1) Leaders of donor nations simultaneously offer aid for policy deals, \((y_i, r_i)\).

2) Leader \( T \) can either accept one of the aid-for-policy deals or reject these deals and implement his preferred policy.

Suppose, for instance, that leader \( A \) offers \((y_A, r_A)\), and leader \( T \) accepts. The leader of \( T \) implements the policy \( y = y_A \) and nation \( A \) transfers \( r_A \) to nation \( T \). Such a resource transfer leaves \( R_A - r_A \) resources in nation \( A \) so the leader can provide each of her supporters with \( \frac{R_A - r_A}{W_A} \) private goods. The available resources in nation \( T \) increase from \( R_T \) to \( R_T + r_A \) and so the private goods supply for supporters

\(^1\)The assumption of quadratic preferences is for convenience as it produces clean first order conditions. The arguments follow for any concave utility function that is decreasing in the distance between \( y \) and \( x_A \).
in T increases from $\frac{R_T}{W_T}$ to $\frac{R_T + r}{W_T}$.
Jablonski (2014) and Kono and Montinola (2009) show aid is disproportionately funneled to political supporters.

As a simplified version of selectorate competition, assume that leaders face a challenger. The value of defecting to a challenger is $\theta_i + \epsilon_i$, where $\theta_i$ is the expected value of the rewards that a challenger can credibly offer and $\epsilon_i$ is a random variable that encapsulates idiosyncratic values of the challenger relative to the incumbent. Supporters defect to the challenger if $\theta_i + \epsilon_i$ exceeds the rewards they receive from the incumbent. We assume that $\epsilon_i$ has distribution $F$, with density $f$ that is smooth, continuous with full support on the real line.

For nations $i = A, B, C$, let $v_i(y, r) = u(\frac{R_i - r}{W_i}) - \sigma_i (y - x_i)^2$ represent the payoff to coalition members in nation $i$ if leader $i$ transfers $r_i$ resources to T and if the policy chosen is $y$. Given the basic selectorate competition, leader $i$ survives with probability $F(v_i(y, r) - \theta_i)$. Leader $i$ maximizes her survival prospects by maximizing $v_i(y, r)$.

If leader T accepts the proposal $(y, r)$, then the payoff to his coalition of supporters is $v_T(y, r) = u(\frac{R_T + r}{W_T}) - \sigma_T (y - x_T)^2$. If T rejects all aid offers, then his supporters receive a payoff of $v_T(x_T, 0) = u(\frac{R_T}{W_T}) - \sigma_T (x_T - x_T)^2 = u(\frac{R_T}{W_T})$.

Here we focus on a single recipient. However, in reality there are many potential aid recipients, say T and T'. For exposition it is easier to consider the deals separately. Further provided that two conditions are met, the aid-for-policy deals that the donors strike with T and with T' are independent. The first of these independence conditions is that deals struck with one nation do not affect the salience of deals with other recipients. We might imagine exceptions to this condition. For instance, if A uses an aid-for-policy deal to get T to accept an anti-communist policy, then this might affect the salience that A places on getting an anti-communist policy in nation T'. The second independence condition is that spending on one aid deal does not affect the relative resource cost of a subsequent aid-for-policy deal. If $u(z) = z$, the linear utility function, and donors never hit their budget constraints (which is the empirical reality), this second condition is met. While idiosyncratic correlation of policy preferences might exist and modeling such quirks in a specific case is useful, in creating a general model we suppress such dependencies.

4 Analysis

If leader T rejects all aid-for-policy deals, then he sets policy to his nation’s ideal point $(y = x_T)$ because, absent any aid, this maximizes his coalition’s payoff at $v_T(x_T, 0)$. If he accepts the aid-for-policy deal $(y, r)$, then his coalition’s payoff is $v_T(y, r)$. Since he best enhances his survival by maximizing his coalition’s payoff, T’s leader only accepts deals better than $v_T(x_T, 0)$; and, if offered multiple deals he accepts the one that maximizes his coalition’s welfare. These arguments formalize as follows:
Lemma 1 Suppose leader T is offered deals \((y, r)\) and \((y', r')\). Leader T accepts deal \((y, r)\) only if \(v_T(y, r) \geq v_T(y', r')\) and \(v_T(y, r) \geq v_T(x_T, 0)\). If \(v_T(y, r) > v_T(y', r')\) and \(v_T(y, r) > v_T(x_T, 0)\), then leader T always accepts \((y, r)\).

Lemma 2 Suppose leaders A and B offer \((y_A, r_A)\) and \((y_B, r_B)\). There are no equilibria in which \(v_T(y_A, r_A) > v_T(y_B, r_B)\) and \(v_T(y_A, r_A) > v_T(x_T, 0)\). If only leader A makes an offer, \((y_A, r_A)\), then there are no equilibria in which \(v_T(y_A, r_A) > v_T(x_T, 0)\).

Lemma 2 states that in any equilibrium in which A’s offer is accepted, leader A’s offer makes T indifferent between accepting it and either accepting another offer or rejecting A’s offer. Such indifference underlies all subsequent characterizations of equilibria and so it is worthwhile to pause to consider the origins of the result, which is a standard feature of spatial voting results. Consider the latter case of lemma 2 in which \((y_A, r_A)\) is the only bid. We know from above that if A’s aid-for-policy deal is too small such that \(v_T(y_A, r_A) < v_T(x_T, 0)\), then leader T will reject the offer. If A offers a deal that makes T indifferent, \(v_T(y_A, r_A) = v_T(x_T, 0)\), then for T to accept A’s offer can be equilibrium behavior, since both accepting and rejecting A’s offer are best responses. We might imagine that A wants to slightly sweeten her deal to given T a strict incentive to accept the offer. Yet, in game theoretic terms this can never be part of an equilibrium. To see why, suppose A sweetens her offer beyond the indifference point by adding a small amount of extra resources, say one extra dollar. Given the extra dollar, T strictly wants to accept A’s offer. However, from her perspective, A can make a better offer that T also wants to strictly accept, namely offering an extra half dollar. However, while A is better off offering an extra half dollar than offering an extra dollar, A could be even better off by reducing the excess still further. Inductively repeating this logic, in equilibrium leader A never offers a deal than is more generous than an offer that makes T indifferent between A’s deal and his other options. In terms of characterizing equilibria, lemma 1 and 2 are useful because A never accepts an inferior deal and any deal accepted on the equilibrium path leaves T indifferent between the offer accepted and either another deal or rejecting all aid deals.

4.1 Single Bidder

We start with the simple single bidder (nation A) bilateral aid case, as modeled by Bueno de Mesquita and Smith (2009a). From lemma 1, if leader A wants an agreement she must offer \((y_A, r_A)\) such that \(v_T(y_A, r_A) \geq v_T(x_T, 0)\); otherwise the deal is rejected. By lemma 2, leader A never offers more than the
minimum to make leader T indifferent. Therefore, in any equilibrium \( v_T(y, r) = v_T(x_T, 0) \). Leader A’s objective is:

\[
\max_{(y_A, r_A)} v_A(y_A, r_A) \text{ subject to } v_T(y_A, r_A) = v_T(x_T, 0)
\]  

(1)

Standard constrained optimization of this program generates the following proposition (details in the appendix):

**Proposition 1** In the single bidder case, there is a unique subgame perfect equilibrium in which leader A offers the aid-for-policy deal \((y_A^\dagger, r_A^\dagger)\) that satisfies:

\[
\frac{(y_A^\dagger - x_A)}{(x_T - y_A^\dagger)} = \frac{\sigma_T W_T}{\sigma_A W_A} \frac{u'(R_A - r_A^\dagger)}{W_A}
\]  

(2)

\[
u(R_T + r_A^\dagger W_T) - u(R_T W_T) - \sigma_T (y_A^\dagger - x_T)^2 = 0
\]  

(3)

Leader T accepts aid deal \((y_A, r_A)\) if and only if \(v_T(y_A, r_A) \geq v_T(x_T, 0)\).

Beyond the requirement that the deal makes T indifferent (lemma 2, equation 3), the equilibrium satisfies a first order condition that ensures efficient bargaining (equation 2). To gain larger concessions, A must pay more and how much more depends upon the institutions within the recipient, T. The extent to which A values policy concessions over resources depends upon A’s resources and institutions. These tradeoffs are captured by the first order condition and provide straightforward comparative static analyses, as we next explore.

### 4.2 Comparative Statics of Single Bidder Bilateral Aid Deals

The amount of policy A buys and how much A pays for these concessions depends upon the resources, institutions and saliences in both A and T. In particular, A buys more policy as \(\sigma_A, W_A \) and \(R_A\) increase and as \(\sigma_T, W_T \) and \(R_T\) decrease. Equation 2, \(\frac{(y_A - x_A)}{(x_T - y_A)} = \frac{\sigma_T W_T}{\sigma_A W_A} \frac{u'(R_A - r_A^\dagger)}{W_A}\) provides a measure of how much policy is bought. The term \(\frac{(y_A - x_A)}{(x_T - y_A)}\) is the ratio of the distance between the policy deal and A’s ideal point and the distance between the policy deal and T’s ideal point. When A is democratic (large \(W_A\)) and salience is high, then the denominator on the RHS is large. As nation A becomes richer (large \(R_A\)), then the marginal value of resources for private goods \(u'\left(\frac{R_A - r_A^\dagger}{W_A}\right)\) declines because \(u'' \leq 0\). This decline in the value of resources retained for distribution to coalition members decreases the numerator of the RHS. Rich, democratic nations that care a lot about the policy buy the most policy.\(^2\) Poor, autocratic leaders in nations with low salience sell the most policy.

\(^2\)This results is consistent with the empirical evidence that democratic nations produce more public goods than autocracies (Bueno de Mesquita et al. 2003; Lake and Baum 2001; Deacon 2009; Blaydes and Kayser 2011).
Figure 1 graphically demonstrates the amount of policy $A$ seeks and also how much aid she provides to purchase that policy in the single bidder scenario as a function of $W_T$. The graph assumes $A$’s policy ideal point, $x_A = 0$ and it assumes that $T$’s policy ideal point, $x_T = 1/2$. The solid line shows the policy concession that $A$ gets from $T$ as a function of $W_T$. As we see, when $W_T$ is small, $A$ purchases lots of policy as reflected by how close the solid line is to 0 on the vertical axis; that is, $A$’s offer is close to her ideal point $x_A$. Now shifting the vertical axis to reflect the cost of aid ($r$), we see by looking at the dashed line that even though leader $A$ asks for nearly full policy compliance, she pays relatively little for these large concessions (dashed line) when $T$’s coalition is small. When $T$’s coalition is small, few supporters need to be compensated so $T$ accepts relatively small amounts of resources in exchange for large policy concessions. As $W_T$ increases in size, aid transfers increase as more people in nation $T$ need to be compensated for the policy losses imposed by the aid-for-policy deal. Further, the Figure shows that as $W_T$ increases, both $A$’s aid expenditure increases and the leader of $A$ succeeds in purchasing less policy. That is, the policy purchased shifts away from 0 ($A$’s ideal point) and moves closer to $1/2$ ($T$’s ideal point) as $W_T$ increases ($y_A$ increases as $W_T$ increases).

In the single bidder scenario, leader $A$ gets more policy concessions and pays less for them as the target nation becomes less democratic (Morrow, Bueno de Mesquita, Siverson and Smith 2006). In such a setting a donor wants to impede democratization in the target nation. All the surplus is captured by the winning coalition in the donor nation, $A$. Leader $T$ is indifferent between the aid-for-policy deal and no deal and is unable to capture any of the surplus. It is perhaps for this reason that in our opening quotation Jomo Kenyatta was so keen to emphasize that Kenya was open to bids from everyone: he did not intend that Kenya be bought cheaply. The presence of a rival bidder empowers the target leader to extract some of the surplus, as we explore in the next section.
5 Competitive Bargaining

Consider the case in which there are multiple potential donors, each of whom wants to move policy in a different direction. In particular, we examine the case with donors A and B in which ideal points are $x_A < x_T < x_B$. To build intuition, suppose leader A makes the offer $(y_A, r_A)$ that T accepts. The policy A buys is less than $x_T$; leader B wants to increase policy. To shift policy leader B could offer an aid-for-policy deal where $y_B > x_T$ and make the deal slightly more attractive to T than A’s deal (i.e. $v_T(y_B, r_B) > v_T(y_A, r_A)$). Leader A would now get a policy choice by T that A’s supporters dislike. In response, she offers an even better deal to leader T. Following this reasoning, the intuition is that leaders A and B face a multiple-bid auction, bidding up the amount of aid each is prepared to give to T until one side is no longer willing to pay more; its willingness to pay more to T is exhausted. More formally,

**Definition 1** The offer $(y_A, r_A)$ exhausts B’s willingness to pay if for all aid-for-policy deals $(y_B, r_B)$ that satisfy $v_T(y_A, r_A) \leq v_T(y_B, r_B)$, B’s supporters prefer the policy A obtains $(y_A)$ and no aid transfer to any aid-for-policy proposal that would be acceptable to T, $v_B(y_B, r_B) \leq v_B(y_A, 0)$.

Leader B might be able to obtain a more desirable policy position for her supporters by offering T a more lucrative aid deal, but once she is exhausted the loss in private benefits from such a deal makes B’s supporters worse off. Therefore, B prefers to live with the policy that A purchases from T $(y_A)$ rather than spend the required resources $(r_B)$ to win the auction.

**Proposition 2** Competitive Bids for Aid-for-Policy Deals: If $x_A < x_T < x_B$ and $\sigma_i > 0$ for $i \in \{A, B, T\}$, then subgame perfect equilibrium outcomes are characterized by the aid-for-policy deal $(y^+_A, r^+_A)$ and $(y^+_B, r^+_B)$ such that

$$
\sigma_A(y^+_A - x_A)W_Au_i(\frac{R_T + r^+_A}{W_T}) - \sigma_T(x_T - y^+_A)W_Tu_i(\frac{R_A - r^+_A}{W_A}) = 0
$$

$$
\sigma_B(y^+_B - x_B)W_Bu_i(\frac{R_T + r^+_B}{W_T}) - \sigma_T(x_T - y^+_B)W_Tu_i(\frac{R_B - r^+_B}{W_B}) = 0
$$

and either

$$
v_B(y^+_B, r^+_B) = v_B(y^+_A, 0) \text{ and } v_A(y^+_A, r^+_A) \geq v_A(y^+_B, 0)
$$

or

$$
v_A(y^+_A, r^+_A) = v_A(y^+_B, 0) \text{ and } v_B(y^+_B, r^+_B) \geq v_B(y^+_A, 0),
$$

Leader A offers aid-for-policy deal $(y^+_A, r^+_A)$; leader B offers aid-for-policy deal $(y^+_B, r^+_B)$; on the equilibrium path, T accepts A’s offer $(y^+_A, r^+_A)$ if B is exhausted and accepts B’s offer $(y^+_B, r^+_B)$ if A is exhausted.
The formal proof and a discussion of equilibrium uniqueness are in the appendix. The equilibrium characterization shares many of the features seen in the single bidder case. Equations 4 and 5 are first order conditions that ensure that A and B offer efficient deals in terms of tradeoffs between the size of concessions sought and the cost of buying such concessions. Equation 6 is the indifference condition required by lemma 2. Following the intuition developed above, equations 7 and 8 ensure that one of the donors is exhausted. The exhausted donor could shift policy back in a direction desired by her supporters, but doing so would take so many resources that these supporters are left worse off. The exhausted donor loses the bidding war and the successful bidder pays no more than is absolutely necessary to exhaust their rival.

5.1 Implications of Competitive Bidding

With rival bidders, it is rich donors with large winning coalitions and high salience that outbid poor, less democratic and lower salience donors. As coalition size and wealth increase, the value of retaining resources to disperse to supporters as private goods declines and so leaders give up these resources in order to purchase policy. If nation B is very poor, very autocratic or has low salience, then A easily outbids its rival and the situation is similar to the single bidder case. As $W_B$, $R_B$ and $\sigma_B$ increase, leader B becomes harder to exhaust. As B becomes a more credible rival, leader A has to pay more ($\tau_A^1$ increases) and moderate its policy demands. Simultaneously the target captures more of the surplus from the aid-for-policy deal. Small wonder that Kenyatta stated “We want to befriend all, and we want aid from everyone.” In his terms, this loosens the reins. It also allowed him and his supporters to enrich themselves (see Wrong (2009) for a history of aid corruption in Kenya).

In the absence of a rival bidder, leader A prefers that nation T is poor and non-democratic. Such
institutional configurations allow leader A to buy large policy concessions cheaply which improves the welfare of her coalition. When rival bidder B is easily exhausted, these induced preferences over T’s institutions persist, as we show in figure 2, which plots the welfare of supporters in A’s coalition against the size of T’s winning coalition under two scenarios. The solid line shows the scenario where B is poor and relatively autocratic, and hence easily exhausted. As in the single bidder case, the welfare of A’s supporters is decreasing in $W_T$. The dashed line shows the case where the rival bidder B is rich and democratic and hence harder to exhaust. Compared to the first scenario, A obtains smaller policy concessions and pays more for them, so her supporters are relatively worse off: the dashed line is below the solid line. However, in contrast to the first scenario, the welfare of A’s supporters is increasing in $W_T$.

When matched against a powerful rival, leader A would prefer that T democratize. Such democratization means that both A and B offer aid-for-policy deals with policies relatively close to T’s ideal point. As both $y_A^*$ and $y_B^*$ move closer to $x_T$ the policy losses from being the losing bidder become smaller and the intensity of the competition to buy policy declines and aid spending is reduced. Democratization in T makes it cheaper for A to defend against B buying large policy concessions.

### 6 Complementary Bidders

The section above supposed that leaders A and B were competitors who wished to move T’s policy in different directions. Here we examine the case of complementarity in which two nations, say A and C, want to move policy in the same direction$^3$: $x_A = x_C < x_T$. Initially we suppose that there is no competitive bidder, i.e. nation B in the previous section cannot bid.

As a reminder of notation, $(y_A^*, r_A^*)$ is the aid-for-policy deal that satisfies proposition 1. Let $(y_C^*, r_C^*)$ represent the analogous policies if leader C were the only bidder. The following simplifies notation:

**Definition 2** Let $U_T$ be the set of aid-for-policy deals that are unacceptable to T: $U_T = \{(y, r) : v_T(y, r) < v_T(x_T, 0)\}$

While A and C can offer any aid-for-policy deal, effectively their choices are restricted. A can offer a deal unacceptable to T ($(y_A, r_A) \in U_T$), A can propose the single bidder offer $(y_A, r_A) = (y_A^*, r_A^*)$, or propose a deal more generous to T. From lemma 2 we know the latter option cannot be part of an equilibrium strategy as there is always a slightly less generous deal that T would also accept. So the de facto choice for each of the complementary bidders is either the minimal single bidder offer or an unacceptable bid.

If neither A nor C offers an acceptable deal, then T rejects the offers and the policy outcome is $x_T$. If A offers $(y_A^*, r_A^*)$ and C’s offer is unacceptable, then A’s offer is chosen. If both A and C propose their

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$^3$The assumption that $x_A = x_C$ is not critical to what follows. We only require that A and C both want to move policy in the same direction. However the assumption is useful as it restricts the number of cases to consider.
single bidder offer, then $T$ is indifferent and randomizes, selecting $A$’s offer with probability $\alpha$.

If $A$ wants to buy much more policy than $C$, a condition that arises when $A$ has more resources, a larger coalition and higher salience, a scenario that we refer to as the dominant buyer of policy, nation $A$ buys policy and $C$ free-rides. Likewise, if $C$ is the dominant buyer of policy, then $A$ free-rides. The setting is more interesting when $A$ and $C$ have similar desires for policy concessions as both nations would prefer to free ride on the policy efforts of the other rather than make an aid-for-policy purchase themselves. In particular, if $A$ is going to obtain similar policy concessions to $C$ ($y_A^\dagger \approx y_C^\dagger$), then $A$ would prefer that $C$ buys the policy, while $C$ prefers that $A$ obtains the concessions. The policy concession is effectively a public good to $A$ and $C$, and each wants the other to provide it. There are three equilibria: $A$ buys the policy concession, $C$ buys the policy concession and a mixed strategy equilibrium.

**Proposition 3** Dominant Buyer of Policy: If $v_A(y_A^\dagger, r_A^\dagger) > v_A(y_C^\dagger, 0)$, then equilibrium offers are $(y_A, r_A) = (y_A^\dagger, r_A^\dagger)$ and $(y_C, r_C) \in U_T$ and the equilibrium outcome is the aid-for-policy deal $(y_A^\dagger, r_A^\dagger)$.

Free Riding: If $v_A(y_C^\dagger, 0) \geq v_A(y_A^\dagger, r_A^\dagger)$ and $v_C(y_A^\dagger, 0) \geq v_C(y_C^\dagger, r_C^\dagger)$, then generically there are three equilibria:

1. $A$ buys policy, $C$ free-rides: $(y_A, r_A) = (y_A^\dagger, r_A^\dagger)$ and $(y_C, r_C) \in U_T$ and the equilibrium outcome is the aid-for-policy deal $(y_A^\dagger, r_A^\dagger)$.

2. $C$ buys policy, $A$ free-rides: $(y_C, r_C) = (y_C^\dagger, r_C^\dagger)$ and $(y_A, r_A) \in U_T$ and the equilibrium outcome is the aid-for-policy deal $(y_C^\dagger, r_C^\dagger)$.

3. Mixed bidding strategies: where $A$ randomizes between $(y_A^\dagger, r_A^\dagger)$ and an unacceptable offer and $C$ randomizes between $(y_C^\dagger, r_C^\dagger)$ and an unacceptable offer (details in the appendix).

In situations of complementarity, the aid-for-policy deals are the same as in the single bidder scenario and the comparative statics are the same. If one bidder has a much greater interest in the policy (because of higher salience, more resources or larger coalition), then that bidder does the buying. When the desires for policy concessions are similar in both potential donors, either donor can provide the aid while the other donor free rides. Although there is the possibility of mis-coordination in the mixed strategy equilibrium, such that no aid-for-policy deal is struck, in other equilibria potential donors coordinate. Colonial legacy has been observed to be an important determinant of aid giving (Alesina and Dollar 2000), perhaps serving as a coordination device.

In the above proposition we assume that there is no rival bidder. Next we examine the situation in which there are both complementary and rival bidders.
6.1 Collaboration and Competition

We examine the case of three potential donors. To do so we focus on a specific symmetric scenario:
\[x_A = x_C = 0 < x_T < x_B = 1\]. Leaders A and C want to move T’s policy in one direction and B wants
to move it in the opposite direction. There are two classes of equilibrium behavior which depend upon
whether A or C exhausts B, or whether B exhausts A and C. As a notational reminder, we denote the
policies that satisfy the competitive bidding case in proposition 2 with \(\hat{\dagger}\). To simplify the statement of
the proposition we suppose C is more easily exhausted than A.

**Proposition 4** If A exhausts B \(v_A(y_A^\dagger, r_A^\dagger) \geq v_A(y_B^\dagger, 0)\) and \(v_B(y_B^\dagger, r_B^\dagger) = v_B(y_A^\dagger, 0)\), then leader A
proposes \((y_A^\dagger, r_A^\dagger)\), leader B proposes \((y_B^\dagger, r_B^\dagger)\) and leader C proposes \((y_C, r_C)\) \(\in U_T\). On the equilibrium
path T accepts A’s offer.

If B exhausts A and C \(v_A(y_A^\dagger, r_A^\dagger) = v_A(y_B^\dagger, 0)\) and \(v_B(y_B^\dagger, r_B^\dagger) \geq v_B(y_A^\dagger, 0)\), then leader A proposes
\((y_A^\dagger, r_A^\dagger)\), leader B proposes \((y_B^\dagger, r_B^\dagger)\) and leader C proposes \((y_C, r_C)\) \(\in U_T\). On the equilibrium path T
accepts B’s offer.

We sketch the interesting features of the equilibrium since the proof is a straightforward extension
of proposition 2. Building on that result, we simply show that the proposition provides mutual best
responses. Given that C is exhausted before A, then A’s offer extracts more that C can extract in
terms of policy concessions; note this is the case when A both wins and loses the bidding competition
against B. Therefore, making an unacceptable offer is a best response for C (although C’s offer is not
unique provided C’s offer is not accepted on the equilibrium path). Given that C does not influence the
competition between A and B, the equilibrium outcome is as per the competitive situation.

In the presence of competitive bidding, a complementary potential donor does not affect the out-
come. However, when the complementary bidders are exhausted by their rival, they can improve their
circumstances by pooling their resources, as we explore next.

7 Multinational Aid Organization

In this section we explore the incentives for forming a multinational aid organization. In particular we
examine the conditions under which A and C would like to fund an organization to grant aid-for-policy
deals on their behalf. Although proposition 3 identified an equilibrium where mis-coordination is possible,
in the purely complementary setting, avoiding mis-coordination is the only incentive to collaborate. If
leader C free rides on A’s purchase of policy, then she has few incentives to collaborate. Leader A would
like C to help shoulder the burden of buying policy, but C prefers to remain a free rider. However, once

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\(^4\)A sufficient condition for C to be exhausted first is \(\sigma_A \geq \sigma_C, W_A \geq W_C\) and \(R_A \geq R_C\). If A were exhausted first the
proposition could be restated by exchanging the labels A and C.
A is exhausted by B, leaders A and C have incentives to collaborate. By sharing the cost of buying policy, potentially A and C can collectively outbid B. Even if they fail to exhaust B, by making a larger collaborative bid than either nation would do individually, they can diminish the extent to which B can shift T’s policy away from A and C’s interests.

To formalize, suppose that prior to the aid-for-policy game, A and C can form an aid agency, M. We ignore the question of bargaining over the parameters of the aid agency and suppose that the agency is charged by A and C to buy policy at a specific position, \( y_M \), and offer \( \mu \) resources. For simplicity we consider the case where A and C are identical in terms of institutions, resources and salience and they equally fund M. Hence A and C each provide \( \frac{\mu}{2} \) resources to M.

Given its commission, the most attractive offer M can make to T is the aid-for-policy deal \((y_M, \mu)\). We assume that A and C only form credible multinational aid organizations, so \( v_T(y_M, \mu) \geq v_T(x_T, 0) \). In response to M’s best offer, B needs to make an offer at least equally attractive to T and B’s most preferred deal follows the first order condition that governs the efficient tradeoff between policy and aid as a function of B’s and T’s resources, institutions and saliences.

**Definition 3** Let \((y_B^\diamond, r_B^\diamond)\) be the policies that solve

\[
\sigma_B(y_B - x_B)W_B u'(\frac{R_T + r_B}{W_T}) - \sigma_T(x_T - y_B)W_T u'(\frac{R_B - r_B}{W_B}) = 0
\]

and

\[
v_T(y_B, r_B) = v_T(y_M, \mu)
\]

The aid-for-policy deal \((y_B^\diamond, r_B^\diamond)\) is B’s most preferred deal that is (weakly) preferred by T to \((y_M, \mu)\).

**Proposition 5** M offers policy \((y_M, \mu)\) (in keeping with its commission). If \( v_B(y_M, 0) \geq v_B(y_B^\diamond, r_B^\diamond) \), that is to say M exhausts B, then B offers \((y_B^\diamond, r_B^\diamond)\) such that \( v_T(y_B^\diamond, r_B^\diamond) < v_T(y_M, \mu) \) and on the equilibrium path T accepts M’s offer. If \( v_B(y_B^\diamond, r_B^\diamond) > v_B(y_M, 0) \), that is to say B exhausts M, then B offers policy \((y_B^\diamond, r_B^\diamond)\), which T accepts on the equilibrium path.

If B exhausts A and C, then by pooling resources leaders A and C can form an organization that either outbids B or causes B to moderate the policy concessions it seeks from T. Figure 3 explores the incentives that A and C have to form and fund M. The graph plots the welfare of the supporters in A and C when A and C are exhausted and outbid by nation B (solid line) and when A and C jointly fund a multinational aid organization M with just enough resources to outbid B (dashed line).\(^5\) The horizontal axis is the size of the winning coalition in nation T, \( W_T \). By forming a multinational aid organization M,

\(^5\)Schneider and Tobin (2011) show donors fund the portfolio of multilateral organizations that support their objectives.

\(^6\)The figure is constructed assuming \( x_A = x_C = y_M = 0, \sigma_A = \sigma_B = \sigma_C = \sigma_T = 1, R_T = 10, R_A = R_B = R_C = 1000, W_A = W_B = W_C = 100 \). Note this is the degenerate case where A, B and C are simultaneously exhausted.
A and C improve their welfare. The figure shows the case in which M outbids B. However, if we suppose that resources that are not spent by M are returned to A and C, then forming M is advantageous for A and C even if M fails to get T to accept its offer. This follows because M’s offer, which is more generous than what A and C would offer individually, causes B to moderate its policy demands, shifting T’s policy less than had M not bid to begin with.

When A and C are outbid by B, figure 3 suggests the advantage of forming M is greater when the target nation’s winning coalition is small. As explored in our discussion of the first order condition in the single bidder section, when \( W_T \) is small, policy concessions are readily bought from leader T as relatively few people need to be compensated with private goods. In such a setting, donors ask for large policy concessions: as \( W_T \to 0 \), \( y_A \to x_A \) and \( y_B \to x_B \). Being outbid in such a setting means enduring a much disliked policy. In contrast when the target’s coalition is large, relatively mild policy concessions are sought and so losing the bidding is relatively unimportant: as \( W_T \to \infty \), \( y_A \to x_T \) and \( y_B \to x_T \). A and C are more likely to collaborate through a multinational aid organization when dealing with autocratic recipients than when dealing with democratic recipients.

8 Implications

Leaders with governments that rely on a large winning coalition, that have deep pockets and that have high salience for policy concessions in other states have strong incentives to become aid donors. The extent to which such leaders can use aid to gain policy concessions depends upon the institutions, resources and salience of target nations. Additionally, the ability to secure policy concessions depends on whether there are competitive bidders with different policy objectives in the international arena. In general, the model proposed here indicates that when a bidder is dominant, it pays less in aid and gains more in policy
concessions than when it has a rival bidder. Rivals increase the cost of aid and diminish the magnitude of policy concessions. Now we wish to ascertain whether these theoretical claims are consistent with the evidence of the post-war period. In what follows we will address how to measure the key variables of our theory and specific the hypotheses to be tested.

Following World War II, the United States was the world’s dominant economic power. Compared to its rivals it had enormous resources. Indeed, the data in Maddison (1995) suggest the U.S. produced about a third of the entire world’s economic product as World War II ended. Importantly, the US was a large coalition, democratic system. Effectively, the US was the only significant foreign aid donor. Our model suggests that under such single bidder circumstances, the US could use (relatively few) aid dollars to buy lots of policy concessions. Further, despite espousing democratizing norms, in the majority of circumstances, US interests were furthered if those states that were targets of aid were kept poor and non-democratic—conditions that should have allowed US leaders to buy lots of policy on the cheap.

Aid-for-policy deals change when there are rival bidders. In relative terms, the US’s economic dominance has declined over the post-war period. With this decline, rival bidders have emerged and no longer can the US secure policy goals with minimal expenditures. The presence of rivals means that the US obtains smaller policy concessions and yet must pay more. These conditions mean that recipient nations capture more of the surplus from aid-for-policy deals than was true when there was a single, dominant bidder. We predict that today the US pays more and gets smaller concessions than it did in the early 1950s; and since foreign aid delivers fewer returns to US citizens today compared to the 1940s and 1950s, current support for foreign aid should be muted compared to the early post-war period.

Although not all of the model’s theoretical predictions are readily tested, many are. We focus empirically on the predictions that relate the presence or absence of a significant rival bidder to the cost and size of policy concessions. We divide the post-war years into three distinct periods and examine the determinants of US economic aid in each period. We treat 1955 and 1989 as watershed years. As discussed above, prior to 1955 the US was at the apogee of its economic power. Although the Soviet Union desired a different world order from that pursued by the United States, in the first decade after the end of the Second World War, the Soviets were pre-occupied with reconstructing their own country and its economy. Hence, they were not significant foreign aid donors until 1955 (Goldman 1965) and so the years from 1946-1955 were a period in which the US did not face a meaningful aid rival.

The USSR formed the Warsaw Pact Organization in 1955, the same year in which it became an aid donor in earnest. From 1955 until 1989 the Cold War was in full swing and then, to the surprise of many, the Soviet Union collapsed, resulting in the diminution of the intense rivalry over security policy. That rivalry may have been resurrected in recent years, following Putin’s return as Russia’s president, but that more recent period is excluded in our data analysis. After 1989 and at least up to 2001 when
our data end, security policy was no longer the dominant issue it had been as aid turned more toward commercial rivalries in which the US faced many competitive bidders such as members of the European Union.

We utilize the following working suppositions. During the Pre-Cold War era, the US was the dominant bidder and had few if any effective rival bidders. In the Cold War period the USSR was a rival bidder and there was intense competition between the two bidders to buy security policy. The situation is more ambiguous in the Post Cold War period. With the decline of the USSR the intense competition to buy security policy dissipated. However, there were many rival bidders for economic and other policies. Often the US and these potential rivals wanted similar policies, implying a collaborative rather than rival bidding situation. Further, the salience for economic issues after the Cold War was generally less than the salience for security issues during the Cold War. Hence, in the context of our model, the Post Cold War offers an intermediate case. We compare aid flows across the three periods. However, the clearest comparison with which to test the theory is between the Pre-Cold War and Cold War periods.

To test the implications regarding the costs and policy benefits of aid with and without significant competitive bidding we reexamine the data of Bueno de Mesquita and Smith (2007). Their initial tests of the implication of aid-for-policy deals pooled the data over all periods. The model examined here however suggests substantive differences in the patterns of aid giving across the different periods. Available data allow us to parse out critical elements of the theoretical predictions. In particular, the theory suggests that when the US is outbid then it gives no economic aid. While we have no means of knowing what the US would have been willing to pay (or the shadow price the USSR would have been willing to pay when, in the end, it lost the bidding), we can know what the United States did pay when it won the aid competition and what it paid when, in the years before 1955, it did not face a serious rival bidder.

With the data that are available we test the following hypotheses implied by the theory:

Hypothesis 1: Prior to 1955 the US, as the dominant aid donor, is expected to give aid to a higher percentage of countries than in the Cold War years (1955 to 1989) or the Post-Cold War, economic competition period.

Hypothesis 2: When the United States provided aid, it spent more on aid on average in the Cold War years than either before or after the Cold War years.

Hypothesis 3: Despite providing more aid during the Cold War years, the United States obtained fewer security policy concessions from aid recipients between 1955 and 1989 than it received before or after the Cold War.

Hypothesis 4: Prior to the Cold War, the coalition size (W) of the target state is positively associated with the amount of US aid received. During the Cold War, the target’s coalition size is either negatively or insignificantly associated with the amount of US aid received. Similarly, after the Cold War, the
relationship between target coalition size and aid received is indeterminant.

Hypothesis 5: After the Cold War (up through 2001, when the data end), donor rivalry is greater than in the pre-Cold War period but weaker than during the Cold War and rivalry is more about economic concerns than security concerns. Hence, statistical effects across all variables are expected to have intermediate values between those of the pre-Cold War and Cold War periods.

Bueno de Mesquita and Smith (2007) examined US economic aid figures taken from the USAID’s Greenbook (2003) and the impact of recipient institutions, wealth, population and salience on aid. In their initial study, Bueno de Mesquita and Smith use the $\tau_B$ measure of the similarity of alliance portfolios as a measure of policy concessions (Bueno de Mesquita 1981), a variable labelled SecurityAlignment. Although we make use of this variable, we are mindful that it, like other measures of policy concessions that are based on alliance data, contains considerable pathologies. In particular, its value is influenced by the presence and alliance behavior of other states beyond the pair under consideration. The bilateral relations between the US and an aid recipient might not change, but with the addition of more states to the system, as happened with decolonization in the post-war period, the $\tau_B$ score changes. Hence shifts in $\tau_B$ might reflect changes in relations between the US and the aid recipient or they might reflect an increase in the number of nations in the system. As a proxy for policy concessions we therefore also rely on affinity scores for United Nations General Assembly voting (Gartzke and Jo 2006). These affinity scores, labeled UNvoting, indicate the extent to which nations voted the same way as the US in the UNGA. While neither of these indicators is isomorphic with shared security interests they are the best estimates available. The economic and population data were obtained from the World Bank World Development Indicators (2004). As a working assumption, we suppose the US has higher salience for policy in large nations than in small nations and also is more concerned about policy in nations that are closer than those that are further away, all else equal. Distance is measured as the logarithm of distance between the US and the target nations (Bennett and Stam 2000). The measure of recipient political institutions, that is winning coalition size $W$, is based on Bueno de Mesquita et al. (2003), which codes coalition size on a five point scale: $W = 0$ being the smallest coalitions, associated with military juntas and monarchies, and $W = 1$ being the largest coalition systems, representing established democracies with effective party competition.

We start our analysis by comparing summary statistics of US aid-giving across the three time periods. For the Pre-1955, Cold War and Post Cold War time periods, table 1 provides summaries of the proportion of nations receiving US aid, the average amount of aid and the policy alignment between the US and potential recipients based upon whether or not these nations received aid. The first and second rows of table 1 show the proportion of nations that received any economic aid from the US and the average amount of aid received by those that got aid in each of the time periods (measured as $\ln(US\ Aid)$ in
constant dollars). The third and fourth rows summarize the average UNGA voting affinities between nations that received no US aid and nations that received US aid. The final two rows summarize average security alignments for those not receiving and receiving US aid.

Comparing the proportion of nations receiving aid across the three time periods we see a substantial decline, as predicted in hypothesis 1. In the pre-1955 period, 68% of nations received aid from the US. During the Cold War this declines to 64%. This 4% decline is significant at the 10% level. In the Post Cold War period only an average of 35% of nations receive aid from the US—significantly lower than the proportion of nations receiving aid in the Pre-Cold War period (Pr = 0.000).

When it was the dominant bidder, the US appears to have bought more nations than it did when in the presence of rival bidders, as predicted by hypothesis 1. Consistent with hypothesis 2, the summary statistics in row 2 show that the US gave larger amounts of aid during the Cold War than either before or after. In the logarithmic units reported these differences appear small, but significant. The non-parametric rank sum test rejects the null hypothesis that the distribution of ln(US Aid) is the same in the Pre-Cold War and Cold War periods (Pr = 0.0008) and the Cold War and Post Cold War periods (Pr = 0.0000); but fails to reject the null hypothesis comparing the Pre-Cold War and the Post Cold War periods (Pr = 0.2287).

It is worth remembering that the pre-1955 period included the Marshall Program reconstruction of Western Europe, an enormously expensive program. The summary statistics support the predictions that the US bought more nations but paid them less prior to 1955 than afterwards. Next we turn to the question of what the US obtained from their aid program by comparing the UN voting records and security alignments of those nations that received aid and those that did not.

A dominant bidder is predicted to obtain larger policy concessions for less money than can a donor in the presence of a rival bidder, hypothesis 3. Table 1 shows the UN voting affinities and security alignments for those nations that received US aid and those that did not. In the pre-1955 period, there are substantial differences in the policy positions between nations receiving aid and those that did not, with those nations receiving aid being substantially closer to the US position. On the -1 to 1 scale of UNvoting, on average nations receiving US aid are 0.26 units closer to the US position than nations not receiving aid during the Pre-Cold War period (Pr = 0.000). In contrast, during the Cold War the

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7For the top row of table 1, which looks at the proportion of nations getting aid, the Pearson’s χ² statistics for the 2x3 table of aid/no-aid versus time periods is χ² = 682.1 (2 degrees of freedom, Pr = 0.000). The comparison of the Pre-Cold War with the Cold War has χ² = 2.876 (1 d.o.f., Pr = 0.090); the comparison of the Cold War to Post Cold War has χ² = 628.95 (1 d.o.f., Pr = 0.000); and, the comparison of Pre-Cold War to Post Cold war has χ² = 198.64 (1 d.o.f., Pr = 0.000).
8The metric for the level of US aid given to states (that receive any aid) is the logarithm of total economic aid. To make comparisons across time periods we use t-tests to compare the mean level of aid and and compare the Wilcoxon rank-sum (Mann-Whitney) tests. The latter test is non-parametric and does not require the assumption of normally distributed data. For the comparison of the Pre-Cold War and the Cold War t = 1.72 (Pr = 0.085) and Wilcoxon = 3.355 (Pr = 0.0008): For the comparison of the Cold War and the Post-Cold War t = 5.555 (Pr = 0.0000) and Wilcoxon = 5.560 (Pr = 0.0000): For the comparison of the Pre-Cold War and the Post-Cold War t = 1.393 (Pr = 0.164) and Wilcoxon = 1.204 (Pr = 0.2287).
difference is smaller, just .010 which is statistically indistinguishable from 0 (Pr.=.437). After the Cold War the average difference in UNvoting between those getting aid and those that do not is a statistically significant -.093 (Pr.=.0000). Nations receiving US aid were more likely to vote with the US in the UN than nations not receiving aid and as predicted by hypothesis 3, the difference is large in the Pre-Cold War period. The pattern is similar with respect to SecurityAlignment. During the Pre-Cold War period, the difference in average SecurityAlignment between those getting aid and those that do not is greater than in subsequent periods.  

The summary statistics in table 1 support hypotheses 2 and 3 that dominant bidders obtain large concessions on the cheap.

| Table 1: The Determinants of US Economic Aid Across Three Post-War Periods |
|-----------------------------|-----------------|-----------------|
| Aid and Policy              | Pre 1955 | Cold War | Post Cold War |
| % Receiving US Aid          | 68%      | 64%      | 35%           |
| Mean(ln(US Aid))            | 9.77     | 9.97     | 9.77          |
| Mean UNvoting: No Aid       | .175     | .008     | -.342         |
| Mean UNvoting: Aid          | .437     | .018     | -.249         |
| Mean SecurityAlignment: No Aid | -.047   | .078     | .155          |
| Mean SecurityAlignment: Aid | .300     | .113     | .083          |

Turning to table 2 we examine the model’s predictions which differ from those of Bueno de Mesquita and Smith (2007) by replicating their analysis while taking into account the presence or absence of rival donors, a factor not considered in their theory. The dependent variable in these regression models is the logarithm of US economic aid (for the set of nations that received aid). We use OLS regression with robust standard errors clustered on target nations. All else equal, the theory first predicts that the amount of aid given under competitive bidding is larger than under a single bidder scenario, hypothesis 2. Hence, aid in the pre-1955 period is expected to be smaller than after this period. Secondly, in the pre-1955, single bidder period the amount of aid is predicted to increase in the degree of democracy (larger winning coalition size, W) in the target state, hypothesis 4. This result was shown in the comparative statics analysis of proposition 1. In contrast, in the presence of a rival bidder the impact of institutions is either diminished or reversed. As illustrated with the example shown in figure 2, a rich or democratic recipient is harder to buy. Therefore each bidder moderates the extent of the policy concessions they seek and this in turn diminishes the intensity of the rivalry to buy policy. Comparisons of the regressions

9To compare the alignment with the US of nations receiving US aid with the alignment with the US of nations not receiving aid we compare UNGA vote affinities and alliance portfolio, τB. We use t-tests and Wilcoxon rank-sum (Mann-Whitney) tests to compare the distribution of alignments between the aid and no-aid groups in each time period.

Here are the detailed results: With respect to the UNGA vote affinities: in the Pre-Cold War period, t = 8.15 (Pr. = 0.000) and Wilcoxon = 6.30 (Pr. = 0.000): in the Cold War period, t = 0.777 (Pr. = 0.437) and Wilcoxon = 1.458 (Pr. = 0.145): in the Post-Cold War period, t = 8.48 (Pr. = 0.000) and Wilcoxon = 11.63 (Pr. = 0.000). With respect to the alliance portfolio measure: in the Pre-Cold War period, t = 13.40 (Pr. = 0.000) and Wilcoxon = 11.55 (Pr. = 0.000): in the Cold War period, t = 3.522 (Pr. = 0.0004) and Wilcoxon = 4.489 (Pr. = 0.0000): in the Post-Cold War period, t = 4.497 (Pr. = 0.0000) and Wilcoxon = 6.779 (Pr. = 0.0000).
for each period support these results.

The analyses in table 2 support the predictions concerning coalition size under different bidding circumstances. In the Pre-Cold War analysis the coefficient estimate on the $W_{t-1}$ variable is positive and statistically significant (Pr.=.029). The magnitude of the effect indicates that moving from the smallest to the largest winning coalition system increased the amount of aid by approximately 11 times. In subsequent time periods, when there is one or more rival bidder, the size of the recipient’s winning coalition is statistically irrelevant to the amount of aid received. The difference in the impact of coalition size in the single bidder period and the rival bidder periods is consistent with hypothesis 4.\textsuperscript{10}

Table 2: The Determinants of US Economic Aid Across Three Post-War Periods

<table>
<thead>
<tr>
<th></th>
<th>Log(US Economic Aid)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pre 1955 b/se</td>
</tr>
<tr>
<td>$W_{t-1}$</td>
<td>2.4410**</td>
</tr>
<tr>
<td></td>
<td>(1.073)</td>
</tr>
<tr>
<td>ln($GDP_{pc_{t-1}}$)</td>
<td>0.4357</td>
</tr>
<tr>
<td></td>
<td>(0.454)</td>
</tr>
<tr>
<td>ln($Population_{t-1}$)</td>
<td>0.1668</td>
</tr>
<tr>
<td></td>
<td>(0.448)</td>
</tr>
<tr>
<td>ln($distance$)</td>
<td>0.4184</td>
</tr>
<tr>
<td></td>
<td>(0.390)</td>
</tr>
<tr>
<td>Security Alignment</td>
<td>-2.2710**</td>
</tr>
<tr>
<td></td>
<td>(1.071)</td>
</tr>
<tr>
<td>UNvoting</td>
<td>1.8599**</td>
</tr>
<tr>
<td></td>
<td>(0.800)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.4971</td>
</tr>
<tr>
<td></td>
<td>(4.916)</td>
</tr>
<tr>
<td>Observations</td>
<td>131</td>
</tr>
</tbody>
</table>

*\textsuperscript{10}The analysis for the Pre-Cold War contains only 131 observations. In part this is because there are fewer nations in this time period, but the low number of observations also results from the economic variables being unavailable for a considerable number of observations. If the economic variables are excluded from the analysis, then the sample size more than doubles and the highly significant positive coefficient estimate remains for the winning coalition variable.
more as in the years when the United States was the dominant bidder. Thus, the Cold War column helps
us see, as expected, that aid during the Cold War cost more and bought less by way of policy concessions
– as measured by UN General Assembly voting – than was true in the years before 1955.

Consistent with the primary hypotheses, the determinants of aid giving differ between the single
bidder and rival bidder scenarios. The coefficients in each of the models in table 2 differ, and differ in
ways consistent with the theoretical predictions. As a final set of tests we focus on differences in US aid
giving between the pre-Cold War and Cold War periods and use matching procedures to compare the
amount of aid given in each period. First, we compare the differences between the level of aid received
in two time periods for the set of nations that received aid in both periods; that is, in the ten year
period prior to the Cold War (1945-1954) and during the first ten years of the Cold War. Second, we
use propensity score matching to estimate the average difference in US aid giving during the Cold War
relative to US aid giving before the Cold War for comparable nations.

Our first matching analysis is to compare the average level of US aid in the 1945 to 1954 period with the
average level of US aid in the 1955 to 1964 period for the set of 70 nations that received US aid in both peri-
ods. In particular for each aid recipient we calculate

\[
\ln(\Delta \text{aid}) = \ln \left( \frac{\sum_{t=1955}^{1964} \text{aid}_t}{\sum_{t=1955}^{1964} 1(\text{aid}_t > 0)} - \frac{\sum_{t=1945}^{1954} \text{aid}_t}{\sum_{t=1945}^{1954} 1(\text{aid}_t > 0)} \right),
\]

where \(1(\text{aid}_t > 0)\) is an indicator function that the nation received any aid. Hence the average level of
aid received is calculated based only on years in which the recipient received US aid. Table 3 examines
\(\ln(\Delta \text{aid})\) using simple OLS regression. The covariates are taken at their 1955 values.

<table>
<thead>
<tr>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>(W)</td>
<td>-5.1579***</td>
<td>-3.9255**</td>
</tr>
<tr>
<td></td>
<td>(1.134)</td>
<td>(1.559)</td>
</tr>
<tr>
<td>(\ln(\text{GDPpc}))</td>
<td>-0.8049</td>
<td>-0.8049</td>
</tr>
<tr>
<td></td>
<td>(0.558)</td>
<td>(0.558)</td>
</tr>
<tr>
<td>(\ln(\text{Population}))</td>
<td>0.5042</td>
<td>0.5042</td>
</tr>
<tr>
<td></td>
<td>(0.554)</td>
<td>(0.554)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.6126*</td>
<td>3.6521***</td>
</tr>
<tr>
<td></td>
<td>(0.331)</td>
<td>(0.729)</td>
</tr>
</tbody>
</table>

\(* p < 0.10, ** p < 0.05, *** p < 0.01\)

Model 4 contains only a constant. The parameter estimate on the constant is significant at the 10%
level and indicates the average level of aid during the Cold War (for those nations receiving aid) was
about 1.8 times high than the level of aid prior to 1955. Models 5 and 6 include coalition size to assess
the extent to which political institutions affect the amount of aid received in each period. In model 5
the coefficient estimates on the constant and \(W\) are significant at the 1% level. The positive coefficient
estimate in the constant predicts that a US aid recipient with a small coalition \((W = 0)\) governance structure would have received nearly 40 times as much aid during the Cold War as before. However, a large coalition recipient \((W = 1)\) would have been expected to have received approximately a quarter of the aid during the Cold War that it received in the pre-Cold War period. Model 6, which includes controls for wealth and population, reports a similar pattern. Aid increases during the Cold War, but to a lesser extent in large coalition systems.

The analyses in table 3 contain only 70 nations because decolonization and the growth in the number of nations in the international system occurs after 1955. For example, very few African nations are independent in 1955 and so Africa is largely excluded from the analysis, even though these nations receive US aid in the post-1955 period. Rather than compare a nation with itself in the Pre and Cold War period, we next adopt a matching procedure to assess the average change in aid level Pre -Cold War compared to Cold War using propensity score matching. In this setting, we treat the Cold War as the treatment variable. For each nation-year observation in the Cold War period the matching procedure finds the closest comparable nation-year observation in the pre-Cold War period and compares the difference in the dependent variable between these matched observations.\(^\text{11}\)

First, we compare the amount of aid \((\log(US\text{EconomicAid}))\) that a target nation receives, matching on institutions (coalition size), the economy \((\ln(\text{GDP per capita}))\), population size \((\ln(\text{Pop}))\) and UN voting affinity for the set of nations receiving any aid from the US. Second, we compare the UN voting affinity of nations receiving US aid, matching on institutions, the economy, population size and the amount of US aid received. We report the average treatment effect (ATE) for each matching analysis in table 4.

In each case the control group is the Pre Cold War period and the treated group is the Cold War period. In terms of the amount of aid given, the average treatment effect is 1.086 with a robust standard error of 0.568, which is significant at the \(Pr. = 0.056\) level. Hence, on average, comparable nations got nearly three times more aid during the Cold War compared to the Pre-Cold War era. The second and third rows of table 4 repeat this matching analysis but restricting it only to large coalition systems \((W_{t-1} = 1, \text{2nd row})\) and smaller coalition systems \((W_{t-1} < 1, \text{3rd row})\). Consistent with previous results, we find that for large coalition systems the ATE is indistinguishable from zero, but smaller coalition systems experienced a large increase in aid during the Cold War.

In the second part of table 4 we switch the focus of the analysis to look at the size of policy concessions, as measured by UN voting affinities. The ATEs show that for nations that are comparable in terms of size, wealth, institutions and the amount of aid they receive, the recipients were less aligned with the

\(^{11}\)Throughout we report results using Stata 13's teffects psmatch using a logit model for the treatment and single observation matches. We obtain similar results using other matching techniques.
US in terms of UNGA voting during the Cold War than prior to the Cold War. This relationship holds for both large and small coalition recipients, although the analysis indicates that the effect is larger for small coalition recipients. On average it appears that for similar levels of aid, the US bought less policy compliance during the Cold War than prior to the Cold War.

Table 4: Average Treatment Effect of Cold War

<table>
<thead>
<tr>
<th>Avg. Treatment Effect (S.E.)</th>
<th>Matched On</th>
<th>Restrictions</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log(USEconomicAid)</td>
<td>W, ln(GDPpc), ln(Pop), UNvoting</td>
<td>W_{t-1} = 1</td>
<td>2,469</td>
</tr>
<tr>
<td>-1.086*(.568)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>.057(1.920)</td>
<td></td>
<td></td>
<td>293</td>
</tr>
<tr>
<td>1.308*(.726)</td>
<td>W, ln(GDPpc), ln(Pop), UNvoting</td>
<td>W_{t-1} &lt; 1</td>
<td>2,176</td>
</tr>
<tr>
<td>UNvoting</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-.117***(.039)</td>
<td>W, ln(GDPpc), ln(Pop), ln(Aid)</td>
<td>W_{t-1} = 1</td>
<td>2,469</td>
</tr>
<tr>
<td>-.148***(.040)</td>
<td>W, ln(GDPpc), ln(Pop), ln(Aid)</td>
<td>W_{t-1} = 1</td>
<td>293</td>
</tr>
<tr>
<td>-.294***(.020)</td>
<td>W, ln(GDPpc), ln(Pop), ln(Aid)</td>
<td>W_{t-1} &lt; 1</td>
<td>2,176</td>
</tr>
</tbody>
</table>

*p < 0.10, **p < 0.05, ***p < 0.01

8.1 Multilateral Aid

In addition to allowing recipients to extract more aid for fewer concessions, the shift from a single dominant bidder to multiple potential donors increases multilateral aid giving. As the model shows when donors have complementary interests, nations are inclined to free-ride on the aid-for-policy deals of others when they can. As long as the US was without serious rival bidders, aid was primarily bilateral. As long as the US easily exhausted rival bidders, those nations that shared its policy preferences had little incentive to contribute to buying policies that they already could enjoy on the back of US efforts.

The growth of rivals shifts this pattern. As shown in the multinational aid organization section, once the US is exhausted, it and nations that share similar policy preferences have incentives to pool their resources into a collaborative aid organization to either buy policy or at least to moderate the extent to which a rival buys concessions with aid. The decline of the US’s hegemonic status coincided with the growth of multilateral aid, which began in the late 1960s and 1970s and today accounts for about 35% of aid (Schneider and Tobin 2013).

9 Conclusions

Our model characterizes aid-for-policy deals and shows how the policies bought and how much aid is given depend upon the political institutions in donors and recipients and the international context. Further the results characterize the induced institutional preferences of donor states.
We were able to test the theoretical propositions regarding the changing nature of aid-for-policy deals in the absence of and in the presence of a rival bidder. The model indicates that when there is a competitive bidder, a winning aid bidder pays more and get less by way of policy concessions than when there is a dominant bidder. The evidence indicates that this is true for US aid in the post-World War II years.

The model also indicates that the presence of a rivalry shifts the induced preferences of donors with respect to political institutions in target states. When there is a single bidder, or one donor easily exhausts its rivals, then the dominant donor prefers that its aid targets are autocratic. Small coalition aid recipients are better positioned to grant large policy concessions at a relatively low cost in the single-bidder environment. However, in cases where there are rival bidders, donors have incentives to genuinely promote democratization in recipients. The waning of US economic dominance and the rise of multilateral aid means donors have stronger incentives to promote democracy in recipients as a means of defending against rivals who attempt to buy policy concessions that are antithetical to the interests of the losing bidder. Particularly, when a target’s preferred policies are close to a donor’s ideal, democratization of the target cements a pro-donor policy and prevents a costly bidding war with rivals.

Anecdotally, much of the democratization that occurred during the Cold War years occurred in nations that were recipients of large scale US aid and that were center-stage in the Cold War rivalry. Although the propositions regarding democratization are difficult to test rigorously as there are many factors pulling in different directions, it is worth noting anecdotally that neither Germany nor Japan held a free election without military supervision by the allied powers until the mid-1950s. That is, they became significantly more democratic, perhaps coincidentally and perhaps not, once the Soviet Union became a credible rival for tilting other government’s policies their way. Similar anecdotal stories can be told about South Korea and Taiwan as the Soviet Union became a more significant rival. We do not want to make too much of these examples as they are only that but they at least illustrate the potential subtle impact, as addressed in the model, of aid rivalry on democracy promotion (as distinct from internal democratizations as characterized in the post-Cold War period). It will have to remain for future research to sort out how to parse the different domestic and international pressures that act for and against democratization.

References


Tan, Bann Seng. 2015. “Liberalization at the Margins.”.


10 Appendix

Proof of lemma 2. From lemma 1 leader T accepts any offer that gives him higher utility than rejecting all aid offers or accepting any other offer. Let $V = \max\{v_T(y_B, r_B), v_T(x_T, 0)\}$. Suppose $v_T(y_A, r_A) > V$. A can reduce its aid transfer by some $\delta > 0$ and make T indifferent between A’s offer and an alternative: $v_T(y_A, r_A - \delta) = V$. However, if A proposes the aid-for-policy deal $(y_A, r_A - \frac{\delta}{2})$, then T strictly accepts A’s new offer since $v_T(y_A, r_A - \frac{\delta}{2}) > V$ and this new offer improves A’s coalition welfare: $v_A(y_A, r_A - \frac{\delta}{2}) > v_T(y_A, r_A)$. Therefore $(y_A, r_A)$ such that $v_T(y_A, r_A) > V$ can not be part of an equilibrium strategy profile.

Proof of proposition 1. The proof proceeds by standard constrained maximization techniques. From the program in equation 1, the Lagrangian equation is $L = v_A(y, r) + \lambda(v_T(y, r) - v_T(x_T, 0))$. Differentiation yields the following first order conditions $L_y = \frac{dL}{dy} = -2\sigma_A(y - x_A) - \lambda_2\lambda_T(y - x_T) = 0$, $L_r = -\frac{1}{W_A}u''(\frac{R_A-r-k}{W_A}) + \lambda\frac{1}{W_A}u''(\frac{R_T+r}{W_T}) = 0$, $L_\lambda = v_T(y, r) - v_T(x_T, 0) = 0$ and second order conditions: $L_{yy} = \frac{d^2L}{dy^2} = -2\sigma_A - \lambda_2\sigma_T < 0$, $L_{yr} = \frac{d^2L}{dydr} = 0$, $L_{y\lambda} = \frac{\partial^2L}{\partial y\partial \lambda} = -2\sigma_T(y - x_T) > 0$, $L_{rr} = \frac{d^2L}{dr^2} = \frac{1}{W_A}u''(\frac{R_A-r-k}{W_A}) + \lambda\frac{1}{W_A}u''(\frac{R_T+r}{W_T}) < 0$, $L_{r\lambda} = \frac{\partial^2L}{\partial r\partial \lambda} = \frac{1}{W_A}u''(\frac{R_T+r}{W_T}) > 0$ and $L_{\lambda\lambda} = \frac{\partial^2L}{\partial \lambda^2} = 0$. Since $L_{rr}$ and $L_{yy}$ are negative and the bordered Hessian matrix

\[
\begin{pmatrix}
L_{yy} & L_{y\lambda} & 0 \\
L_{yr} & L_{rr} & L_{r\lambda} \\
L_{\lambda\lambda} & L_{r\lambda} & 0
\end{pmatrix}
\]

the program is concave and the first order conditions correspond to a unique maximum. Rearranging the FOCs yields $\frac{u''(\frac{R_A-r-k}{W_A})}{x_T} = \lambda = \frac{w_T}{w_A}u''(\frac{R_A-r-k}{W_A}) > 0$ and $v_T(y, r) - v_T(x_T, 0) = u(\frac{R_T+r}{w_A}) - u(\frac{R_T+r}{w_T}) - \sigma_T(y - x_T)^2 = 0$, which lead to equations 2 and 3. ■

Proof of proposition 2. We proceed as follows: we rule out characteristics of strategy profiles that cannot be part of an equilibrium. We then show that the strategies characterized above are mutual best responses.

1) First suppose leader B offers the deal $(y_B, r_B)$ such that $v_T(y_B, r_B) \leq v_T(x_T, 0)$. In this setting, A’s best response is identical to that described in the proof of proposition 1 and such a response would make T indifferent between the deal with A and implementing $x_T$ and receiving no aid. There exists a sufficiently small $\delta > 0$ such that $(y_B, r_B) = (y_A^1, r_B^1 + \delta)$ where $(y_B^1, r_B^1)$ are the policies characterized in proposition 1. T strictly prefers to accept this offer and $v_B(y_B^1, r_B^1 + \delta) > v_B(x_T, 0) > v_B(y_A^1, 0)$. Hence the conjectured policies $(y_B, r_B)$ cannot be part of an equilibrium. Therefore, in any equilibria, $v_T(y_B, r_B) > v_T(x_T, 0)$ and (by repeating the argument for A) $v_T(y_A, r_A) > v_T(x_T, 0)$.

2) By lemma 2, in equilibrium $v_T(y_A, r_A) = v_T(y_B, r_B)$.

3) Next we show that one leader must be exhausted: suppose $v_T(y_A, r_A) = v_T(y_B, r_B) > v_T(x_T, 0)$ and given this indifference T accepts A’s offer with probability $\alpha$ and accepts B’s offer with probability $\beta = 1 - \alpha$. Suppose that neither leader is exhausted. If $\alpha < 1$ and $v_A(y_A, r_A) > v_A(y_B, 0)$ (that is A is
not exhausted), then there exists some $\delta > 0$ such that $v_A(y_A, r_A) > v_A(y_A, r_A + \delta) > v_A(y_B, 0)$ and $T$ strictly prefers to accept $(y_A, r_A + \delta)$ rather than $(y_B, r_B)$. Leader $A$ prefers to offer $\delta$ more to ensure her offer is accepted. Similarly, suppose $\beta < 1$ and $v_B(y_B, r_B) > v_B(y_A, 0)$. Then there exists some $\zeta > 0$ such that $v_B(y_B, r_B) > v_B(y_B, r_B + \zeta) > v_B(y_A, 0)$ and $T$ strictly prefers to accept $(y_B, r_B + \zeta)$ rather than $(y_A, r_A)$. Leader $B$ prefers to offer $\zeta$ more to ensure her offer is accepted. Hence if neither leader is exhausted (and $\alpha$ and $\beta$ cannot both be 1), then at least one leader wants to increase her offer by some infinitesimal $\delta$ or $\zeta$. Hence, at least one leader must be exhausted in equilibrium.

4) Suppose both leaders are strictly exhausted: $v_T(y_A, r_A) = v_T(y_B, r_B) > v_T(x_T, 0)$ and $(y_A, r_A) < v_A(y_B, 0)$ and $v_B(y_B, r_B) < v_B(y_A, 0)$. Given $T$’s indifference between $A$ and $B$’s offers, suppose $T$ accepts $A$’s offer with probability $\alpha$ and accepts $B$’s offer with probability $\beta = 1 - \alpha$. If $\alpha > 0$, then $A$ strictly prefers to offer $(x_A, 0)$ which is rejected by $T$ in favor of $(y_A, r_B)$. But this improves $A$’s payoff because $A$ is strictly exhausted. If $\beta > 0$ then $B$ strictly prefers to offer $(x_B, 0)$ which is rejected by $T$ in favor of $(y_A, r_A)$. But this improves $B$’s payoff because $B$ is strictly exhausted. Therefore, both $A$ and $B$ cannot be strictly exhausted.

5) We now characterize the equilibrium conditions, focusing on the case where $B$ is exhausted (the analysis is analogous if $A$ is exhausted) and show that no player can improve its payoff from those described by the proposition. Given the results above, any strategy that is a candidate for an equilibrium has the properties that $v_T(y_A, r_A) = v_T(y_B, r_B) > v_T(x_T, 0)$ and (at least) one leader is exhausted. Suppose that leader $B$ is exhausted. $A$ picks policies such that $(y_A, r_A) = \arg \max(y_A, r_A) v_A(y_A, r_A)$ subject to $v_T(y_A, r_A) \geq v_T(y_B, r_B)$. This program can be solved by standard constrained maximization techniques. In particular, we form a Lagrangian equation

$$L = -\sigma_A(y_A - x_A)^2 + u\left(R_{A-x_A}^T W_A^T\right) + \lambda\left(-\sigma_T(y_A - x_T)^2 + u\left(R_{T-x_T}^T W_T^T\right)\right)$$

where $\lambda$ is the Lagrangian multiplier. Since $L_{y_A} = -2\sigma_A(y_A - x_A)$ and $L_{x_T} = 0$, $L_{u} = 0$, $L_{\lambda} = 0$, $L_{r_A} = 0$ and $L_{r_B} = 0$, this implies

$$u'\left(R_{A-x_A}^T W_A^T\right) = \lambda = \frac{\sigma_A(y_A - x_A)}{\sigma_T(y_A - x_T)} \quad \text{(equation 4)}$$

and $v_T(y_A, r_A) = v_T(y_B, r_B)$ \quad \text{(equation 6)}$; the second order conditions are identical to proposition 1.

There are no deviations that improve $A$’s payoff. If $A$ offers more to $T$, then she reduces her payoff. If she offers less then $T$ accepts $B$’s offer, and by non-exhaustion of $A$, this makes $A$ worse off.

Next consider $B$’s optimal aid-for-policy offer $(y_B, r_B) = \arg \max(y_B, r_B) v_B(y_B, r_B)$ subject to $v_T(y_B, r_B) \geq v_T(y_A, r_A)$. This program is analogous to that for nation $A$ above and so satisfies equation 5. On the equilibrium path, $B$’s payoff is $v_B(y_B^*, 0)$. By exhaustion, any offer that is acceptable to $T$ makes $B$ worse off since for all $(y_B, r_B)$ such that $v_T(y_B, r_B) \geq v_T(y_A^*, r_A^*)$, $v_B(y_B, r_B) \leq v_B(y_B^*, 0)$. If $B$ offers $(y_B, r_B)$ such that $v_T(y_B, r_B) \leq v_T(y_A^*, r_A^*)$, then $T$ accepts $A$’s offer so such alternative strategies are not utility improving. As per lemma 1, $T$ accepts any strictly preferred policy. On the equilibrium path, $T$ accepts the offer of the non-exhausted leader, which is a best response since $T$ is indifferent.

34
The uniqueness of the equilibrium characterized in proposition 2

The equilibrium is not unique as there are multiple equilibria where B is exhausted and makes offers that, if accepted, would make her strictly worse off: \( v_B(y_B, r_B) < v_B(y_A^*, 0) \) and \( v_A(y_A^*, r_A^*) \geq v_A(y_B, 0) \). However these equilibria rely on B making non-credible offers that she would never want to implement. This is to say, by offering more than she is willing to pay, leader B might force leader A to bid more. However, we restrict attention to cases where the losing state’s bid must be credible (i.e. its leader would want to make the trade if its proposed deal were accepted). In this case the competitive bidding equilibrium is unique (except for the degenerate case when both nations are simultaneously exhausted).

**Proof of proposition 3.** From lemma 2, A and C never spend more than is necessary. Therefore either \( (v_T(y_A, r_A) = v_T(x_T, 0) \) and \( v_T(y_C, r_C) \leq v_T(x_T, 0) \) or \( (v_T(y_A, r_A) \leq v_T(x_T, 0) \) and \( v_T(y_C, r_C) = v_T(x_T, 0) \)). From the constrained maximization in proposition 1 any bid that is accepted must therefore be either \((y_A^1, r_A^1)\) or \((y_C^1, r_C^1)\). Hence A and C offer either of these deals or one that is unacceptable.

**Dominant Buyer of Policy:** If \( v_A(y_A^1, r_A^1) > v_A(y_C^1, 0) \), then on the equilibrium path A offers \((y_A, r_A) = (y_A^1, r_A^1)\) which is accepted. \( T \) is indifferent between accepting A’s offer and rejecting and so accepting is a best response. \( v_A(y_A^1, r_A^1) > v_A(y_C^1, 0) \) implies that \( y_A^1 < y_C^1 \) so \( C \) strictly prefers that A buys policy (since it buys more) than having \( C \) buy policy. Therefore \( C \)’s best response is to make an unacceptable offer. Given that \( C \) makes an unacceptable offer, A’s program is identical to that characterized in the single bidder case.

**Free-rider:** \( v_A(y_C^0, 0) \geq v_A(y_A^1, r_A^1) \geq v_A(x_T, 0) \) and \( v_C(y_A^1, 0) \geq v_C(y_C^1, r_C^1) \geq v_A(x_T, 0) \). If \( C \)’s bid is unacceptable, then A’s best response is \( v_A(y_A^1, r_A^1) \). If \( C \)’s bid is \((y_C^1, r_C^1)\), then A’s best response is to make an unacceptable offer. Hence the first two strategy profiles are equilibria.

Next we examine the mixed strategy. With probability \( \rho_A \) A offers \((y_A, r_A) = (y_A^1, r_A^1)\) and with probability \( (1 - \rho_A) \) A offers \((y_A, r_A) \in U_T\). With probability \( \rho_C \) A offers \((y_C, r_C) = (y_C^1, r_C^1)\) and with probability \( (1 - \rho_C) \) A offers \((y_C, r_C) \in U_T\). If \((y_C, r_C) \in U_T\) and \( v_T(y_A, r_A) \geq v_T(x_T, 0) \), then \( T \) accepts \((y_A, r_A)\); if \((y_A, r_A) \in U_T\) and \( v_T(y_A, r_A) \geq v_T(x_T, 0) \), then \( T \) accepts \((y_C, r_C)\); if \( v_T(y_A, r_A) > v_T(x_T, 0) \) then \( T \) accepts \((y_C, r_C)\); if \( v_T(y_A, r_A) > v_T(y_C, r_C) \geq v_T(x_T, 0) \), then \( T \) accepts \((y_A, r_A)\); if \( v_T(y_A, r_A) = v_T(y_C, r_C) \geq v_T(x_T, 0) \) then \( T \) accepts \((y_A, r_A)\) with probability \( \alpha \) and \( T \) accepts \((y_C, r_C)\) with probability \( (1 - \alpha) \), where \( \alpha \in (0, 1) \). \( \rho_A = \frac{v_C(y_A^1, r_A^1) - v_C(x_T, 0)}{v_C(y_A^1, r_A^1) - v_C(x_T, 0) + \alpha(v_C(y_C^1, r_C^1) - v_C(x_T, 0))} \)

and \( \rho_C = \frac{v_A(y_A^1, r_A^1) - v_A(x_T, 0)}{v_A(y_A^1, r_A^1) - v_A(x_T, 0) + \alpha(v_A(y_C^1, r_C^1) - v_A(x_T, 0))} \).

Given \( \alpha \) and \( \rho_C \), A is indifferent between offering \((y_A^1, r_A^1)\) and an unacceptable deal and so randomizing is a best response for A. C’s best responses are analogous. ■

**Proof of proposition 5.** M’s deals are characterized by M’s commission. To ensure that her deal is accepted, leader B must offer \((y_B, r_B)\) that \( T \) accepts and exhausts M. Hence leader B’s program is \( \max_{(y_B, r_B)} v_B(y_B, r_B) \) subject to \( v_T(y_B, r_B) \geq v_T(y_M, \mu) \). This constrained maximization problem is
similar to those examined earlier. It yields the first order condition (equation 9) and indifference condition (equation 10). The deal \((y_B^\#_B, r_B^\#_B)\) is thus B’s best deal that outbids M. If \(v_B(y_B^\#_B, r_B^\#_B) > v_B(y_M, 0)\), then B prefers to outbid M and does so with the minimal possible offer that T will accept, \((y_B^\#_B, r_B^\#_B)\). If \(v_B(y_B^\#_B, r_B^\#_B) \leq v_B(y_M, 0)\), then B prefers the policy position \(y_M\) rather than making an offer that T accepts. Hence making an offer that T rejects is a best response. ■