# Bargaining and Governance in Multiparty Presidential Regimes<sup>\*</sup>

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#### Abstract

We develop a formal model of bargaining and exchange in multiparty presidential regimes that simultaneously considers political transfers, monetary transfers, and policy concessions. The two-party case of the United States serves as a benchmark in discussing exchange in presidential regimes, while the Brazilian regime serves as an exemplar of the multiparty case. The results of the modeling suggest that the executive is better off using political transfers in exchange for support from factions that are ideologically similar to the executive and better off using monetary transfers when obtaining support from more ideologically distant factions. The model also suggests that the optimal strategy for building a governing coalition depends on expectations about future bargaining conditions. We examine empirical evidence from a period of "normal" politics in Brazil under President Lula and from the more difficult first year of Lula's presidency.

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## 1 Introduction

The partisan composition of government coalitions and the consequences for policy formulation are frequent subjects of political research, yet a good deal of untapped theoretical and analytical leverage resides in the mechanics of intra-governmental bargaining and exchange in multiparty presidential regimes. We develop a formal model of exchange in such regimes that simultaneously considers political transfers, monetary transfers, and policy concessions. A large proportion of the research on presidential regimes focuses on the United States context, but dozens of presidential regimes exist worldwide. Importantly, these presidential regimes vary institutionally in ways that affect governance.

Only recently have scholars begun examining the importance of coalitions in multiparty presidential regimes. This new research recognizes that multiparty presidential regimes are special cases of neither parliamentarism nor the two-party presidential model. This newer research has addressed topics like coalition voting discipline (Amorim Neto 2002), the relationship between coalition type and legislative success (Cheibub, Przeworski, and Saiegh 2004), the flexibility that executive appointment powers provide presidents (Martínez-Gallardo 2005), the impact of cabinet formation on presidential survival in times of crisis (Negretto 2006), and the relationship between presidential policymaking strategies and cabinet formation (Amorim Neto 2006). However, none of this research has modeled how or why particular governmental coalitions emerge as a consequence of the overall executive-legislative bargaining game.

In what follows, we first consider literatures relevant to intra-governmental bargaining and exchange and examples of exchange mechanisms in presidential regimes. We use the two-party U.S. case as a point of comparison and Brazil as an exemplar of the multiparty situation. We then develop the formal model and examine its predictions with an empirical case study.

## 2 Fused and Shared Powers

Institutional differences between parliamentary and presidential regimes have consequences for the mechanics of exchange. The lesser formal accountability of the executive to the legislature in presidential regimes (i.e., no formal need to maintain parliamentary confidence) fundamentally alters the exchange relationship. The inability to call for new elections in presidential regimes also changes the bargaining stakes. Terms are fixed for both heads of government and legislators in presidential regimes but typically only have a maximum length in parliamentary ones.<sup>1</sup> Furthermore, in presidential regimes no necessary linkage exists between the executive and a large party in the legislature due to the separate origin of the two institutions, though minority governments are also surprisingly common in parliamentary regimes (see Cheibub, Przeworski, and Saiegh 2004).

The need for parliamentary confidence and the ability to call for new elections change the time horizons and endgames for bargaining in parliamentary regimes. These differences between presidential and parliamentary regimes also have consequences for the timing of coalition formation and the dispersal of political benefits (e.g., governing coalition partnerships and cabinet positions). Coalition formation occurs at the beginning of a term in a parliamentary regime, though it may also occur as a last recourse before new elections when a government loses legislative confidence or in an informal manner prior to legislative elections. In presidential regimes, on the other hand, formal coalitions often take shape at the outset, but greater opportunities exist for day-to-day adjustments in political benefits during the executive's term and from one piece of legislation to the next. These political assets tend to be more liquid in presidential regimes.

Exchange in multiparty presidential regimes also diverges markedly from exchange in the much-studied U.S. two-party presidential case. The U.S. electoral system generates a simple party system that reduces informational costs and transaction costs in bargaining. However, the two-party system also provides no real options in terms of coalition formation and potential legislative partners. An executive may have many combinatorial options available for building a governing coalition in a multiparty presidential regime – both in terms of the number of parties and the ideological heterogeneity of the coalition partners. States with more complex party systems also may provide substantial powers and resources to presidents with the goal of overcoming potential bargaining problems (for the case of Brazil see Figueiredo and Limongi 1999, 2000; Amorim Neto, Cox, and McCubbins 2003; Alston and Mueller 2006).

## 3 Coalitions, Pork, and Policies

While all regimes endow presidents with bargaining mechanisms, the types and strengths of these mechanisms vary across presidential regimes. Our model focuses on mechanisms falling into three categories: political transfers (specifically related to governing coalitions), monetary transfers (particularly pork), and policy concessions. Not modeled explicitly

<sup>&</sup>lt;sup>1</sup>Some presidential regimes have provisions like the Impeachment Trial Clause of the U.S. Constitution, but these provisions are not intended for resolving situations of legislative deadlock.

here are agenda-setting powers, the ability of the president to legislate directly (Howell 2003; Pereira, Power, and Rennó 2005), executive veto powers (Cameron 2000), and intertemporal policy transfers or "logrolling." The following discussion occasionally incorporates such elements of exchange for illustrative purposes, however.

#### 3.1 Political Transfers

Among the political inducements available to presidents is recognized membership in the formal pro-government coalition, cabinet posts, patronage, and campaign assistance. To the extent being associated with the government and with the potential passage of legislation is useful for a legislator or political party, recognition as a member of the governing coalition is a valuable commodity. This is especially the case if the party has access to the policymaking powers and resources associated with cabinet posts. Political patronage is valuable in that it bolsters support for the party and the re-election prospects of individual legislators. Direct campaign assistance, particularly from a popular executive, can carry significant political value, as well.

The ability of the U.S. executive to use political inducements in building legislative support is constrained on multiple fronts. As mentioned earlier, the U.S. executive has no real options for playing potential coalition partners off one another. Further, the tremendous incumbency advantage in the legislature means that presidential campaign assistance is hardly essential.<sup>2</sup> Additionally, the U.S. president is able to make thousands of political appointments, but partisan politics prevent giving many of these slots to individuals not affiliated with the president's party. Several hundred of these appointments at the highest levels require the consent of the U.S. Senate, which in contemporary times frequently has been in the hands of the opposing party. The system of patronage is constrained to the point that many such positions take years to fill, are filled using "recess" appointments, or are never filled at all during a president's term.

In the Brazilian multiparty case, on the other hand, an executive with minority support has numerous options for creating a coalition government.<sup>3</sup> These options generate a market for legislative support in which the executive and various parties may negotiate for inclusion in the governing coalition. The Brazilian executive also has discretion over appointments to

 $<sup>^{2}</sup>$ Incumbents in the U.S. Congress who have run for re-election have won over 90% of these contests over the last few decades.

 $<sup>^{3}</sup>$ Such coalition building is necessary for majority support. Since 1990, the Brazilian executive's party has never held more than 25% of the seats in the lower house of the national legislature. A total of 21 parties won seats in the Chamber of Deputies in the most recent 2006 elections.

approximately 40,000 posts in the public bureaucracy, over intergovernmental transfers to states and municipalities, and over certain financial resources in the National Development Bank (BNDES) not included in the annual budget.

Our formal model incorporates political transfers in the form of "coalition goods," or membership in the governing coalition and the awarding of cabinet posts. The substantial parliamentary literature on coalitions primarily considers the factors that influence the formation, duration, and termination of government coalitions (see King et al. 1990; Warwick 1994; Laver and Shepsle 1996; Laver 1998; Martin and Stevenson 2001; Laver 2003). According to one set of theories, the relative sizes and ideologies of parties are key characteristics in determining the formation and survival of coalitions. "Neo-institutional" theories of government formation in parliamentary regimes, on the other hand, have focused on the importance of factors like the identity of formateur parties, the ability to choose the timing of negotiations (particularly for the prime minister), the nature of the reversion outcome in bargaining, the ability of prime ministers to control the agenda and the timing of elections, and investiture requirements (see Laver 1998; Martin and Stevenson 2001). Another category of theories includes hybrids of the "size and ideology" and "neoinstitutional" categories, while "behavioral norms" theories (Martin and Stevenson 2001) focus on the importance of pre-electoral commitments and the exclusion of parties with anti-system views.

#### 3.2 Monetary Transfers

As with coalition goods, the U.S. case provides an example of a rather constrained market in the area of pork-barrel politics. The lack of a line-item veto means that the executive cannot single out any particular legislator's pork for elimination, and much of the pork trading occurs in the committee system of the legislature. The central research questions in the U.S. context have concerned the distribution of pork across electoral districts and whether legislators are able to reap electoral benefits from pork distribution (Stein and Bickers 1994; Levitt and Snyder 1995; Bickers and Stein 1996; Alvarez and Saving 1997; Sellers 1997; Levitt and Snyder 1997; Balla et al. 2002). Only more recently have U.S. scholars considered the use of pork as a support-building tool, with results showing earmark projects to be better at inducing support in the House than are allocations to states (Lee 2003) and that pork distribution is essential for passing general-interest legislation (Evans 2004).

Brazil has served as the setting for much of the recent non-U.S. research concerning pork

distribution in a presidential setting. Contrary to the U.S. case, the president of Brazil has a line-item veto at her disposal and has control over the disbursement of pork requests made by individual legislators (i.e., individual budgetary amendments). Several studies have linked the votes of individual legislators to executive approval and disbursement of pork (Ames 2001; Pereira and Mueller 2004; Alston and Mueller 2006), with positive reelection consequences for those who play along (Ames 1987; Samuels 2002; Pereira and Renno 2003). In terms of timing, this exchange appears to work in both directions – the executive offers pork to induce support and uses pork to reward legislators for past voting behavior (Pereira and Mueller 2004).

#### 3.3 Policies

The discussion of policy concessions fits most closely with institution-based spatial models of policy outcomes. Common findings of such models are that the number of "veto players," the nature of the veto powers, the agenda-setting powers of the players, the location of the policy status quo, the necessary size of the winning coalition, and the policy preferences of the actors are all important determinants of policy outcomes (Haggard and McCubbins 2001; Tsebelis 2002). In short, in a one- or two-dimensional policy space, the executive may achieve her ideal policy if this constellation of factors is favorable, but often the executive must compromise by agreeing to a policy that is removed from that ideal point though preferable to the status quo.

The U.S. executive has relatively limited agenda-setting and blocking powers. The separation of powers (better defined as the "sharing" of powers among branches) and the checks and balances in the U.S. system are features designed to limit the legislative powers of executives, as well. The executive may legislate via executive order but is bounded in what he may achieve. Additionally, the executive has no line-item veto and may not introduce any bill directly into a legislative body (though a substantial proportion of significant legislation originates in the executive branch). Further, whether the executive has majority partisan support in the legislature also makes a difference for policy outcomes in the U.S. system.<sup>4</sup> As evidence, current President George W. Bush vetoed only one piece of legislation during the six years that the Republican Party controlled both Houses of the Congress but has vetoed five pieces of legislation in the first ten months (January-November 2007) of having

<sup>&</sup>lt;sup>4</sup>The issue of presidential influence under circumstances of divided government in the U.S. is a much studied one. The central controversy in this literature appears to be whether divided government decreases the passage of "significant" or "landmark" legislation, though the role of presidential vetoes in bargaining has also received some attention (e.g., Cameron 2000).

a Democrat-controlled House and evenly split Senate.

Again as a contrast, the Brazilian executive has rather wide-ranging power to make policy unilaterally (Pereira, Power, and Rennó 2005), a system feature that the legislature must consider in its negotiations. The Brazilian executive also has demonstrated the ability in recent years to get legislation passed even when a super-majority is necessary and even in situations in which it initially appears that a majority of the legislature is ideologically opposed to the legislation.

### 4 Model

We develop a stylized model of coalition formation and inter-branch bargaining in a presidential regime. The collective legislative player (henceforth "legislative") is formed by a large number of agents, formally a continuum in the interval [0, 1]. We denote the preferred policy of a member  $i \in [0, 1]$  of the legislative by  $x(i) \in \mathbb{R}^+$  and let x(i) be strictly increasing and continuous in i, with x(0) = 0 and x(1) = 1. The status quo is set at  $x_s = 0$ , and the executive's preferred policy is set at  $x_e = 1$ . A policy x is implemented if and only if it has the support of the majority of the legislative. We motivate the need for bargaining by assuming that the political agendas of the executive and the majority of the legislative are not aligned, that is  $x(\frac{1}{2}) < \frac{1}{2}$ . This assumption implies that, if given the option between the status quo and the executive's preferred policy, the majority of the legislative would lean towards the status quo.

The executive can make transfers to members of the legislative. We classify transfers as either monetary (m) or political (p). For instance, monetary transfers capture pork distribution while political transfers capture the distribution of cabinet positions. If the implemented policy is  $x \in [0, 1]$ , and the executive makes transfers  $\{m(i), p(i)\}_{i \in [0,1]}$ , the executive's utility is

$$U_e\left[x, \{m(i), p(i)\}_{i \in [0,1]}\right] = -(1-x) - \beta_m^e \int_0^1 m(i)di - \beta_p^e \int_0^1 f(i) p(i)di.$$
(1)

The parameter  $\beta_m^e$  ( $\beta_p^e$ ) measures the disutility of monetary (political transfers). Because m(i) is a function of i, we are allowing the executive a lot of discretion in the assignment of monetary transfers to different members of the legislative. As discussed previously, discretion varies considerably across presidential regimes. We can capture these differences by saying that if the executive faces various institutional impediments in setting m(i), the relative disutility of monetary transfers  $\beta_m^e$  is higher. Political transfers are discounted by

a function f(i), which varies across members of the legislative. We assume that f(i) is continuous and strictly decreasing in i. Intuitively, a member i with a political agenda that is farther away from the executive's agenda, upon receiving a political transfer (e.g., a cabinet position) has a higher probability of making political decisions that are inconsistent with the executive's preferred decisions. For instance, in a presidential regime in which the executive strongly opposes sharing cabinet positions with members of the legislative with policy preferences distant from  $x_e$ , we should expect f(i) to be strictly convex in i. The utility of each member i of the legislative is given by

$$U_i\left[x, \{m(i), p(i)\}_{i \in [0,1]}\right] = -\left[x - x(i)\right]^2 + \beta_m^l m(i) + \beta_p^l p(i).$$
(2)

The parameter  $\beta_m^l$  ( $\beta_p^l$ ) measures the relative weight that member *i* gives to monetary (political) transfers. For instance, the effectiveness of monetary transfers in convincing voters to reelect a legislator varies from one presidential regime to another. We should expect a high value of  $\beta_m^l$  in a scenario in which monetary transfers are very effective.

In general, the overall policy x and the level of transfers that the executive makes to each member of the legislative are the result of bargaining between the executive and the corresponding member. In what follows, we capture the idea that the implementation of a policy depends not only on the distribution of policy preferences but also on how members of the legislative are distributed across different groups or factions. Factions are represented by sub-intervals of the interval [0, 1], and we define a faction  $(a, \mu)$  by its median member (henceforth denoted as "leader")  $a \in (0,1)$  and its size  $\mu > 0$ . A member of the legislative cannot participate in more than one faction at the same time. We assume that a faction  $(a, \mu)$  supports the executive as long as this support is consistent with the incentive constraint of its leader. Precisely, the leader intermediates the negotiations between the executive and the faction, and all members of the faction abide by the decisions taken by the leader. A more general approach would also take into consideration the incentives necessary to sustain unified support of the faction. In particular, members of the faction may require a minimum amount of individual monetary and political transfers in exchange for their commitment. We analyze in detail the "endogenous" transfers between the executive and the legislative leader but we do not dwell much on intra-faction negotiations. We capture these negotiations by simply assuming that a faction supporting the executive receives "exogenous" transfers from the executive in the amount of  $\rho\mu$ . We further assume that these transfers are made at the same time as the formation of the formal governing coalition.

#### 4.1 Political versus Monetary Transfers

Assume that the executive forms a "winning coalition" (i.e., a majority support coalition for a particular piece of legislation) with a faction  $(a_c, \mu_c)$  such that  $x(a_c) \geq \frac{1}{2}$ , and a faction  $(a_d, \mu_d)$  such that  $x(a_d) < \frac{1}{2}$ . Clearly, the leader of faction  $(a_c, \mu_c)$  supports the executive without endogenous transfers because his preferred policy is aligned with the executive's preferred policy.<sup>5</sup> In this case, the executive only needs to make monetary and political transfers in the amount of  $\rho\mu_c$  to ensure the unified support of the faction. The more interesting scenario involves the bargaining between the executive and the faction  $(a_d, \mu_d)$ with  $x(a_d) < \frac{1}{2}$ . In this case, exogenous transfers are not sufficient to ensure the support of the faction, and endogenous transfers are also necessary. In what follows, we determine the level of these endogenous transfers and the actual policy that is implemented. To ease exposition, we refer to endogenous transfers simply as transfers. If the implemented policy is  $x \in [0, 1]$  and the executive makes transfers m and p, the executive's utility is<sup>6</sup>

$$U_{e}(x,m,p) = -(1-x) - \beta_{m}^{e} \mu m - \beta_{p}^{e} f(a_{d}) \mu p, \qquad (3)$$

while the utility of the leader of the faction  $(a_d, \mu_d)$  is

$$U_{(a_d,\mu_d)}(x,m,p) = -[x - x(a_d)]^2 + \beta_m^l m + \beta_p^l p.$$
(4)

Let the executive's bargaining power relative to the members of the legislative be given by  $\theta \in (0, 1)$ . We solve the bargaining between the executive and the faction  $(a_d, \mu_d)$  by applying the generalized Nash solution.<sup>7</sup> In our analysis, we take the status quo as the threat point so that the status quo prevails if the bargaining ends in a deadlock. The policy x and the level of political transfers p and monetary transfers m to faction  $(a_d, \mu_d)$  solve

$$\max_{\{x,m,p\}} \left[ U_e\left(x,m,p\right) - U_e^{sq} \right]^{\theta} \left[ U_{\left(a_d,\mu_d\right)}\left(x,m,p\right) - U_{\left(a_d,\mu_d\right)}^{sq} \right]^{1-\theta},\tag{5}$$

<sup>&</sup>lt;sup>5</sup>More precisely, in the case in which  $x(a_c) = \frac{1}{2}$ , the leader of the faction is indifferent between the status quo and the executive's preferred policy. We break the tie by assuming that the leader supports the executive in this case.

<sup>&</sup>lt;sup>6</sup>Note that we do not include the exogenous transfers in the utility functions because they do not affect the outcome of the bargaining between the executive and the faction  $(a_d, \mu_d)$ . During the bargaining, exogenous transfers are sunk, meaning that they reflect costs that were already incurred and cannot be recovered.

<sup>&</sup>lt;sup>7</sup>The generalized Nash solution can be thought of as an "equilibrium" of a cooperative game as in Nash (1950), or as a subgame perfect equilibrium of a non-cooperative game between the executive and the faction  $(a_d, \mu_d)$  as in Rubinstein (1982). Indeed, Rubinstein (1982) proves that the latter has a reduced form that approaches the former as the time between rounds of negotiations in the bargaining game converges to zero.

subject to  $U_e(x, m, p) \ge U_e^{sq}$ ,  $U_{(a_d, \mu_d)}(x, m, p) \ge U_{(a_d, \mu_d)}^{sq}$ ,  $m \ge 0$ , and  $p \ge 0$ .  $U_e^{sq}$  corresponds to the utility of the executive and  $U_{(a_d, \mu_d)}^{sq}$  corresponds to the utility of the faction  $(a_d, \mu_d)$  at the status quo. In the Appendix we provide a detailed characterization of the solution to this problem. We focus on the case where positive transfers occur during the bargaining between the executive and the faction  $(a_d, \mu_d)$ . This can be ensured by assuming that the executive's bargaining power is not too large. Precisely, throughout the article, we assume that

$$\theta < \min\left\{\frac{\frac{\beta_{p}^{l}}{2\mu\beta_{p}^{e}}\frac{1}{f(a_{d})x(a_{d})}}{1 + \frac{\beta_{p}^{l}}{2\mu\beta_{p}^{e}}\frac{1}{f(a_{d})x(a_{d})}}, \frac{\frac{\beta_{m}^{l}}{2\mu\beta_{m}^{e}}\frac{1}{x(a_{d})}}{1 + \frac{\beta_{m}^{l}}{2\mu\beta_{m}^{e}}\frac{1}{x(a_{d})}}\right\}.$$
(6)

There are two scenarios that we need to take into account. First, if political transfers arise as an outcome of the bargaining between the executive and the faction  $(a_d, \mu_d)$ , positive transfers occur if and only if<sup>8</sup>

$$\frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l} \ge f(a_d) \,. \tag{7}$$

Intuitively, positive political transfers occur when the relative cost of political transfers to the executive is low and/or the relative benefit of political transfers to the faction  $(a_d, \mu_d)$  is high. The implemented policy when political transfers are positive is

$$x_p(a_d, \mu_d) = x(a_d) + \frac{\beta_p^l}{2\mu_d \beta_p^e} \frac{1}{f(a_d)},$$
(8)

and the amount of political transfers is

$$p(a_d, \mu_d) = \frac{1}{\beta_p^l} x_p(a_d, \mu_d) \left[ (1 - \theta) x_p(a_d, \mu_d) - x(a_d) \right].$$
(9)

Lemma 1 describes how the policy  $x_p(a_d, \mu_d)$  and the amount of political transfers vary as a function of the parameters. The proof is in the Appendix.

**Lemma 1** If the bargaining between the executive and the faction  $(a_d, \mu_d)$  involves positive political transfers, we have that  $\frac{\partial x_p(a_d,\mu_d)}{\partial \left(\frac{\beta_p^l}{\beta_p^p}\right)} > 0$ ,  $\frac{\partial x_p(a_d,\mu_d)}{\partial \mu} < 0$ ,  $\frac{\partial x_p(a_d,\mu_d)}{\partial a_d} > 0$ . Moreover,  $\frac{\partial p(a_d,\mu_d)}{\partial \beta_p^l} < 0$ ,  $\frac{\partial p(a_d,\mu_d)}{\partial \mu} < 0$ ,  $\frac{\partial p(a_d,\mu_d)}{\partial \theta} < 0$ . Finally,  $\frac{\partial p(a_d,\mu_d)}{\partial a_d} < 0$  if and only if  $\frac{x'(a_d)}{x(a_d)} > -\frac{f'(a_d)}{f(a_d)}$ ,

<sup>&</sup>lt;sup>8</sup>When  $\frac{\beta_m^e}{\beta_m^l}/\frac{\beta_p^e}{\beta_p^l} = f(a_d)$ , the solution to the bargaining problem is indeterminate and there can be a mix between monetary and political transfers. Without loss of generality, we break this indeterminacy by assuming that only political transfers occur.

and

wh

$$\frac{\frac{\beta_p}{f(a_d)} \left\{ \frac{x'(a_d)}{x(a_d)} - \frac{f'(a_d)}{f(a_d)} \left[ 1 + \frac{2\beta_p}{f(a_d)x(a_d)} \right] \right\}}{\left[ 1 + \frac{\beta_p}{f(a_d)x(a_d)} \right] \left[ x'(a_d) - \frac{\beta_p f'(a_d)}{f^2(a_d)} \right]} < \theta < \frac{\frac{2\beta_p}{f(a_d)x(a_d)}}{1 + \frac{\beta_p}{f(a_d)x(a_d)}},$$
  
ere  $\beta_p \equiv \frac{\beta_p^l}{2\mu\beta_p^e}$ 

Not surprisingly, Lemma 1 shows that, if political transfers are positive, an increase in the utility of these transfers to the faction  $(a_d, \mu_d)$  and a decrease in the disutility of these transfers to the executive allow the latter to implement a more favorable political agenda. A more favorable agenda is also implemented when the size of the faction  $(a_d, \mu_d)$ , and thus the total cost of political transfers, is small and when the preferred policy of the leader of the faction is closer to  $x_e$ . Interestingly, the implemented agenda  $x_p$   $(a_d, \mu_d)$  does not depend on the relative bargaining power of the executive. However, the bargaining power is key to defining the total amount of political transfers. If the executive retains a lot of bargaining power, she does not need to make a large amount of political transfers in order to implement the agenda  $x_p$   $(a_d, \mu_d)$ .

Finally, note that, conditional on political transfers being positive, if the faction  $(a_d, \mu_d)$  has a preferred policy that is relatively close to the executive's preferred policy  $x_e$ , the faction may receive less political transfers than if it had a preferred policy farther away from the executive's preferred policy. Intuitively, for any given policy x that is close to  $x_e$ , there is no need to make a lot of political transfers to implement this policy if the faction  $(a_d, \mu_d)$  has preferences that are also relatively close to  $x_e$ . However, political transfers are also more efficient in producing a policy that is close to  $x_e$  if the faction  $(a_d, \mu_d)$  has preferences that are relatively close to  $x_e$ . The final outcome depends on which effect is stronger. It turns out that the former effect dominates if and only if  $\frac{x'(a_d)}{x(a_d)} > -\frac{f'(a_d)}{f(a_d)}$  and the bargaining power of the executive assumes intermediate values.

We now consider the case in which monetary transfers are positive. This occurs if and only if

$$\frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l} < f(a_d).$$
(10)

Intuitively, positive monetary transfers arise as an outcome of the bargaining between the executive and the faction  $(a_d, \mu_d)$  when the relative cost of monetary transfers to the executive is low and/or the relative benefit of monetary transfers to the faction  $(a_d, \mu_d)$  is high. In turn, the implemented policy under monetary transfers and the level of monetary transfers are given, respectively, by

$$x_m(a_d, \mu_d) = x(a_d) + \frac{\beta_m^l}{\beta_m^e} \frac{1}{2\mu},$$
(11)

and

$$m(a_d, \mu_d) = \frac{1}{\beta_m^l} x_m(a_d, \mu_d) \left[ (1 - \theta) x_m(a_d, \mu_d) - x(a_d) \right].$$
(12)

Lemma 2 describes how the policy  $x_m(a_d, \mu_d)$  and the amount of monetary transfers vary as a function of the parameters. The interpretation of the results is similar to the interpretation in Lemma 1, with the difference that we are now looking at positive monetary transfers. The proof is in the Appendix.

**Lemma 2** If the bargaining between the executive and the faction  $(a_d, \mu_d)$  involves positive monetary transfers, we have that  $\frac{\partial x_m(a_d, \mu_d)}{\partial \left(\frac{\beta_m^l}{\beta_m^m}\right)} > 0$ ,  $\frac{\partial x_m(a_d, \mu_d)}{\partial \mu} < 0$ ,  $\frac{\partial x_m(a_d, \mu_d)}{\partial a_d} > 0$ . Moreover,  $\frac{\partial m(a_d, \mu_d)}{\partial \beta_m^l} < 0$ ,  $\frac{\partial m(a_d, \mu_d)}{\partial \mu} < 0$ ,  $\frac{\partial m(a_d, \mu_d)}{\partial \theta} < 0$ . Finally,  $\frac{\partial m(a_d, \mu_d)}{\partial a} < 0$  if and only if  $\frac{\frac{\beta_m}{2x(a_d)}}{1 + \frac{\beta_m}{x(a_d)}} < \theta < \frac{\frac{\beta_m}{x(a_d)}}{1 + \frac{\beta_m}{x(a_d)}}$ ,

where  $\beta_m \equiv \frac{\beta_m^l}{2\mu\beta_m^e}$ .

#### 4.2 Ideological Heterogeneity within a Winning Coalition

In the previous section, we characterized the executive's policy and the underlying political and monetary transfers that are required to implement the policy. Throughout our analysis, we assumed that the winning coalition chosen by the executive included a faction  $(a_c, \mu_c)$ with  $x(a_c) \geq \frac{1}{2}$  and a faction  $(a_d, \mu_d)$  with  $x(a_d) < \frac{1}{2}$ . In what follows, we are going to analyze in more detail how the ideological heterogeneity within a winning coalition affects the executive's policy and the political and monetary transfers. We are also going to delve deeper into the executives's choice of a winning coalition.

First, in order to examine the impact of ideological heterogeneity, we need to have a clear definition of "distance" in a coalition. Henceforth, we say that a faction  $(a, \mu)$  within the executive coalition is a "distant" faction if  $x(a) < \frac{1}{2}$  and that a faction  $(a, \mu)$  within the executive coalition is a "close" faction if  $x(a) \ge \frac{1}{2}$ . We then measure the degree of ideological heterogeneity within the winning coalition by the distance between the preferred policy of the leader of the close faction and the preferred policy of the leader of the distant faction. Proposition 1 summarizes our results. The proof is in the Appendix.

**Proposition 1** Consider a winning coalition formed by a close faction  $(a_c, \mu_c)$  and a distant faction  $(a_d, \mu_d)$ . Moreover, let  $x(\tilde{a}) = \frac{1}{2}$  and assume that  $f(0) > \frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l} > f(\tilde{a})$ . Then, (i) the close faction only receives exogenous transfers in the amount of  $\rho\mu_c$ , (ii) if the distant faction is such that  $f(a_d) \ge \frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l}$  (which occurs when  $a_d$  is relatively small), the political agenda that solves the bargaining problem is given by  $x_m(a_d, \mu_d)$  and there are positive monetary transfers to this faction given by  $m(a_d, \mu_d)$ . If instead, the distant faction is such that  $f(a_d) < \frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l}$  (which occurs when  $a_d$  is relatively large), the political agenda that solves the bargaining problem is given by  $x_p(a_d, \mu_d)$  and there are positive political transfers to this faction given by  $x_p(a_d, \mu_d)$  and there are positive political transfers to this faction given by  $p(a_d, \mu_d)$ . These transfers are in addition to exogenous transfers in the amount of  $\rho\mu_d$ .

Proposition 1 shows that the farther away a faction is with respect to the preferred policy of the executive, the higher the probability that this faction will receive monetary transfers but no political transfers. Hence, in a coalition with a high degree of ideological heterogeneity, collaboration from distant factions is usually achieved through monetary transfers. Alternatively, in a coalition with a small degree of ideological heterogeneity, collaboration is usually achieved through political transfers. The intuition for these results is clear. If the members of faction  $(a, \mu)$  have preferences that are far away from the executive's preferences, the former will probably use their positions in the political bureaucracy to foster an agenda that will not be aligned with the executive's agenda. As a result, monetary transfers constitute a more efficient way to gather their support.

#### 4.3 The Choice of a Governing Coalition

We now examine the executive's choice of a formal governing coalition. The executive always chooses to form a coalition with the faction  $(a_c^*, \mu_c^*)$ , where  $a_c^* = \tilde{a}$ ,  $\mu_c^* = 2(1 - \tilde{a})$ , and  $\tilde{a}$  satisfies  $x(\tilde{a}) = \frac{1}{2}$ . This is the largest possible faction whose leader has preferences that are aligned with the executive, so there is only a need to make exogenous transfers that sustain the internal cohesion of the faction. Clearly, if  $\mu_c^* \geq \frac{1}{2}$ , the support of this faction is sufficient to ensure the support of the majority of the legislative, and there is no need to form a coalition with distant factions. Therefore, in order to study the possibility of a coalition that includes distant factions, we assume that  $\mu_c^* < \frac{1}{2}$ , which occurs when  $\tilde{a} > \frac{3}{4}$ . Without loss of generality, we can represent each distant faction  $(a, \mu)$  by the preference of its leader a. The close faction has a measure  $\mu_c^*$ , so the executive is always going to choose a distant faction with a size  $\mu_d^* = \frac{1}{2} - \mu_c^* = 2\tilde{a} - \frac{3}{2}$ . In this way, the executive builds a coalition at the lowest possible cost. This implies that a lower bound on the set of distant

factions from which the executive is going to choose is given by  $L \equiv \frac{\mu_d^*}{2} = \tilde{a} - \frac{3}{4}$ , and an upper bound is given by  $U \equiv \tilde{a} - \frac{\mu_d^* + \mu_c^*}{2} = \tilde{a} - \frac{1}{4}$ . Figure 1 depicts the close faction and a range of possible distant factions for a particular functional form for x(i), where x(i) is strictly increasing, x(0) = 0, x(1) = 1, and  $x(\frac{1}{2}) < \frac{1}{2}$ .

#### [FIGURE 1 ABOUT HERE]

The problem facing the executive is to choose a distant faction  $(a_d, \mu_d^*)$ , where  $a_d \in [\tilde{a} - \frac{3}{4}, \tilde{a} - \frac{1}{4}]$ . Consider initially the case where the executive anticipates that monetary transfers will occur in the bargaining with the faction  $(a_d, \mu_d^*)$ . The implemented political agenda is given by  $x_m(a_d, \mu_d^*)$  and monetary transfers are equal to  $m(a_d, \mu_d^*)$ . The executive's utility is given by

$$U_e^m(a_d, \mu_d^*) = -1 + x_m(a_d, \mu_d^*) - \beta_m^e \mu_d^* m(a_d, \mu_d^*).$$
(13)

We can rewrite (13) as (where  $\frac{\beta_m^l}{2\mu_d^*\beta_m^e} \equiv \beta_m^*$ )

$$U_e^m(a_d, \mu_d^*) = -1 + \frac{1}{2} \left\{ (1+\theta) \left[ x(a_d) + \beta_m^* \right] + \theta x(a_d) \left[ 1 + \frac{1}{\beta_m^*} x(a_d) \right] \right\}.$$
 (14)

Since x(a) is increasing in a,  $U_e^m(a_d, \mu_d^*)$  is increasing in  $a_d$ . This implies that if positive monetary transfers will occur at the bargaining stage, the executive prefers to form a coalition with the faction  $(a_d, \mu_d^*)$  whose leader has preferences that are closest to the policy  $x_e$ . Precisely, the executive will form a coalition with the faction  $(a_d^*, \mu_d^*)$ , where  $a_d^* = \tilde{a} - \frac{1}{4}$  and  $\mu_d^* = 2\tilde{a} - \frac{3}{2}$ .

Consider now the scenario in which the executive anticipates that positive political transfers will occur in the bargaining with the faction  $(a_d, \mu_d^*)$ . The political agenda will be given by  $x_p(a_d, \mu_d^*)$  and political transfers will be given by  $p(a_d, \mu_d^*)$ . As a result, the executive's utility is equal to

$$U_e^p(a_d, \mu_d^*) = -1 + x \left(a_d, \mu_d^*\right) - \beta_p^e f(a_d) \, \mu_d^* p\left(a_d, \mu_d^*\right).$$
(15)

After some computation, we can rewrite (15) as (where  $\frac{\beta_p^l}{2\mu_d^*\beta_p^e} \equiv \beta_p^*$ )

$$U_{e}^{p}\left(a_{d},\mu_{d}^{*}\right) = -1 + \frac{x\left(a_{d}\right)}{2} \left\{\theta\left[1 + \frac{f\left(a_{d}\right)x\left(a_{d}\right)}{\beta_{p}^{*}}\right] + (1+\theta)\left[1 + \frac{\beta_{p}^{*}}{f\left(a_{d}\right)x\left(a_{d}\right)}\right]\right\}.$$
 (16)

In order to characterize the executive's choice of a coalition in this case, we need to compute the derivative of  $U_e^p(a_d, \mu_d^*)$  with respect to  $a_d$ . We obtain

$$\frac{\partial U_{e}^{p}\left(a_{d},\mu_{d}^{*}\right)}{\partial a_{d}} = \frac{1}{2f\left(a_{d}\right)} \left\{ \theta \frac{f\left(a_{d}\right)x\left(a_{d}\right) + \beta_{p}^{*}}{\beta_{p}^{*}} \left[ \begin{array}{c} 2x'\left(a_{d}\right)f\left(a_{d}\right) \\ +f'\left(a_{d}\right)x\left(a_{d}\right) \\ -\frac{f'\left(a_{d}\right)}{f\left(a_{d}\right)}\beta_{p}^{*} \end{array} \right] + \left[ \begin{array}{c} x'\left(a_{d}\right)f\left(a_{d}\right) \\ -\frac{f'\left(a_{d}\right)}{f\left(a_{d}\right)}\beta_{p}^{*} \end{array} \right] \right\}.$$
(17)

Lenghty but straightforward shows that this derivative is always positive. Hence, as in the case with positive monetary transfers, the executive prefers to form a coalition with the faction  $(a_d^*, \mu_d^*)$ , where  $a_d^* = \tilde{a} - \frac{1}{4}$  and  $\mu_d^* = 2\tilde{a} - \frac{3}{2}$ . Proposition 2 summarizes our result.

**Proposition 2** Irrespective of whether transfers at the bargaining stage are going to be monetary or political, the executive always prefers to form a governing coalition with the highest possible degree of ideological homogeneity. Moreover, after the coalition is formed, monetary (political) transfers will dominate the bargaining between the executive and the distant faction  $(a_d^*, \mu_d^*)$  if and only if  $f(a_d) \leq (>) \frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l}$ .

#### 4.3.1 The Choice of a Heterogeneous Governing Coalition

The results above capture the idea that in general the executive prefers a ideologically homogeneous coalition. However, there are instances where, for various reasons, a ideologically heterogeneous coalition may emerge as an optimal choice. For instance, this outcome may occur if the executive attaches great disutility to political transfers as compared to monetary transfers. This outcome may also occur if members of the legislative around the status quo are ideologically fluid, meaning that they enjoy a relatively lower disutility if the implemented policy is inconsistent with their preferred policy. In what follows, we formally address this possibility by assuming that the utility function of a faction  $(a, \mu)$  is given by

$$\widehat{U}_{(a,\mu)}(x,m,p) = -\frac{1}{f(a)} \left[ x - x(a) \right]^2 + \beta_m^l \mu m + \beta_p^l \mu p.$$
(18)

Remember that the function f(a) is strictly decreasing in a, hence  $\frac{1}{f(a)}$  is strictly increasing in a, capturing the idea that members of the legislative that support the status quo are less ideologically engaged. In the Appendix we provide a detailed characterization of the solution to this problem.<sup>9</sup> After some computation, we can express the executive's utility

<sup>&</sup>lt;sup>9</sup>In the Appendix we solve for the general case in which the utility of faction  $(a, \mu)$  is given  $U_{(a,\mu)}(x,m,p) = -h(a) [x - x(a)]^2 + \beta_m^l m + \beta_p^l p$ . Obviously, our previous analysis corresponds to the particular case where h(a) = 1, and the current analysis corresponds to  $h(a) = \frac{1}{f(a)}$ .

under positive political transfers as

$$\widehat{U}_{e}^{p}(a,\mu) = -1 + \frac{x(a)}{2} + \frac{1}{2\beta_{p}} \left\{ \beta_{p}^{2} + \theta \left[ x(a) + \beta_{p} \right]^{2} \right\},$$
(19)

while the executive's utility under positive monetary transfers is

$$\widehat{U}_{e}^{m}(a,\mu) = -1 + \frac{1}{2} \left\{ x(a) + f(a) \beta_{m} + \frac{\theta \left[ x(a) + f(a) \beta_{m} \right]^{2}}{f(a) \beta_{m}} \right\}.$$
(20)

Clearly, (19) is strictly increasing in a. This implies that the executive prefers to form a more homogeneous governing coalition if she anticipates that positive political transfers will be required at the bargaining stage. Now, (20) is strictly decreasing in a if and only if

$$x'(a) + f'(a)\beta_m + \frac{\theta \left[x(a) + f(a)\beta_m\right]}{\beta_m f^2(a)} \left[2f(a)x'(a) + f(a)f'(a)\beta_m - f'(a)x(a)\right] < 0.$$
(21)

We can rewrite (21) as

$$-\left\{1+\theta\left[1-\left[\frac{x(a)}{f(a)\beta_{m}}\right]^{2}\right]\right\}f'(a)\beta_{m} > x'(a)\left\{1+2\theta\left[1+\frac{x(a)}{f(a)\beta_{m}}\right]\right\}.$$
 (22)

Inequality (22) can be interpreted as follows. Assume that the executive is *committed* to making positive monetary transfers. In this case, if the executive attaches a small disutility to monetary transfers ( $\beta_m$  is large) and if members of the legislative that usually favor the status quo are relatively less ideologically engaged (-f'(a) is large), the executive prefers to make monetary transfers to a faction that is ideologically distant.

Finally, in order to identify the conditions under which the executive opts to form a coalition with a distant faction when it can choose between monetary and political transfers, we need to compare  $\widehat{U}_e^p(a,\mu)$  evaluated at its maximum, which occurs when  $a = \widetilde{a} - \frac{1}{4}$ , and  $\widehat{U}_e^m(a,\mu)$  evaluated at its maximum, which occurs when  $a = \widetilde{a} - \frac{3}{4}$ . We obtain that  $\widehat{U}_e^m(a = \widetilde{a} - \frac{3}{4}, \mu) > \widehat{U}_e^p(a = \widetilde{a} - \frac{1}{4}, \mu)$  if and only if

$$f\left(\widetilde{a}-\frac{3}{4}\right)\beta_m > \beta_p + \frac{1}{(1+\theta)} \left\{ \begin{array}{c} \left[x\left(\widetilde{a}-\frac{1}{4}\right)-x\left(\widetilde{a}-\frac{3}{4}\right)\right]\left(2\theta+1\right)+\\ \frac{\theta\left[x\left(\widetilde{a}-\frac{1}{4}\right)\right]^2}{\beta_p} - \frac{\theta\left[x\left(\widetilde{a}-\frac{3}{4}\right)\right]^2}{f\left(\widetilde{a}-\frac{3}{4}\right)\beta_m} \end{array} \right\}.$$
 (23)

Proposition 3 summarizes our result.

**Proposition 3** If the executive anticipates that monetary transfers will dominate at the bargaining stage, it forms a governing coalition with a greater ideological dispersion if and only if (23) is satisfied. This occurs when (i) the executive attaches a relatively large disutility to political transfers  $(\frac{\beta_m}{\beta_p}$  is sufficiently large), and (ii) members of the legislative that usually favor the status quo are relatively less ideologically engaged ( $f(\tilde{a} - \frac{3}{4})$  is large).

## 5 The Empirical Case of Brazil

We return to the case of Brazil to provide empirical grounding for the formal model. Brazil provides an example of a multiparty, coalition-based presidential system in which the president is constitutionally strong and has multiple different tools and resources at his disposal. These characteristics make Brazil particularly useful for exploring the mechanics of the model.

Table 1 demonstrates President Luiz Inácio Lula da Silva's strategy for balancing political transfers, monetary transfers, and policy preferences over the January 2004 to July 2005 period.<sup>10</sup> The first characteristic evident in this table is that Lula chose to concentrate political transfers (i.e., cabinet posts) on his own party, PT. Lula drastically expanded the number of cabinet portfolios (from 21 to 35) with several new social-policy ministries, and most of the new positions went to PT loyalists. PT held 60% of the cabinet portfolios despite only holding 29% of the seats in the Chamber of Deputies. Further indicative is that the proportionality between the number of Chamber seats and the number of cabinet portfolios dropped from a high of 0.76 during the previous Cardoso Administration to 0.50 in the second cabinet of the Lula Administration (Amorim Neto 2007).<sup>11</sup>

#### [TABLE 1 ABOUT HERE]

Theoretically, the executive should be able to count on support from his own party with only minimal transfers. However, three factors mitigated against such an outcome here. One was that PT is a highly fractured party with no clear ideological core. Additionally, Lula anticipated difficult legislation and foresaw a need to preemptively reward his core supporters. Lula needed to pass certain constitutional amendments to free funds for other projects, to provide credible signals to nervous markets, and to satisfy external lenders. Finally, the baseline expectation of the political game in Brazil is that a certain level of transfers will occur.

Also evident from the table is that Lula's coalition included a relatively large number of parties from across the ideological spectrum, most likely a consequence of the constraints imposed on Lula by the distribution of parties in the Chamber.<sup>12</sup> Lula's coalition corresponded

 $<sup>^{10}</sup>$ As explained later, Lula's first year as president (2003) was unusual. Additionally, the composition of the governing coalition changed after July 2005. These are the reasons for delimiting the time period in the table.

<sup>&</sup>lt;sup>11</sup>For comparison, Cardoso's own party, PSDB, held 29% of the cabinet seats while holding 26% of the seats in the Chamber of Deputies (during the second cabinet of Cardoso's second term).

<sup>&</sup>lt;sup>12</sup>Observed values of the ideology scores for all major parties in 2001 ranged from 1.66 to 8.65, so the

to 318 seats in the Chamber of Deputies, which was barely greater than the extraordinary (3/5 = 308 seats) majority needed for approval of constitutional amendments. Rather than form a true "grand coalition" with the opposition, Lula cobbled together a coalition from a number of smaller parties, regardless of ideological positions. The resulting coalition was quite diverse and ideologically heterogeneous.

As suggested by the formal model, Lula may also have chosen a heterogeneous governing coalition in anticipation that monetary transfers would be more effective or desirable for generating legislative support than would political transfers. Ideologically closer parties were given political transfers while parties that were ideologically more distant primarily received monetary transfers (i.e., the disbursement of individual budgetary amendments to party members). This pattern (r = -0.44 for the last two columns of Table 1) corresponds to the predictions of the formal model, as it is relatively "cheaper" to purchase support in this manner. This strategy seems to have worked well as Lula's legislative support (i.e., the average percentage of legislators voting with executive positions during a given month) over the period shown averaged 81.6%.<sup>13</sup>

The year 2003, the first of Lula's presidency, presents a more extreme test for the formal model. As mentioned earlier, Lula faced some very difficult legislative tasks early in his presidency. Complicating matters even more was that Lula needed to adopt policy positions contrary to those of his party in order to respond effectively to external and budgetary pressures. Attempted social security (i.e., pension) reforms are perhaps most illustrative. Lula's proposed reforms tracked very closely with the reform proposals of the previous Cardoso government, an ideological opponent of Lula. The pension legislation represented an extreme departure from previous Lula and PT rhetoric on the issue, thereby creating fissures within the party and the broader governing coalition. The proposal also antagonized many of the President's most important support groups like labor unions and civil servants.

Much like Cardoso before him, Lula envisioned pension reform as an important component of solving the fiscal crisis of government. The social security system in Brazil was seen as one of the main sources of the country's large internal deficit. Cardoso's proposal to tax transfers to retired workers proved highly controversial because it involved acquired rights and entitlements, and getting this measure passed through Congress required much effort (Alston and Mueller 2006). The Supreme Court declared the measure unconstitutional, a

spread of ideology scores within the cabinet was substantial.

<sup>&</sup>lt;sup>13</sup>The data on legislative support come from the Secretary of the Directing Table (Speaker of the House) of Brazil's Chamber of Deputies.

decision that enraged the government and its supporters in Congress. Despite threatening to change the Constitution, the Cardoso government eventually abandoned the issue.

The Lula government reopened the issue of pension reform and did so in Cardoso's terms. The unpopular taxation of retired worker pensions was reintroduced and approved in the Chamber of Deputies in August 2003, with 357 supportive votes in two rounds. Lula had appointed three new justices, and the Supreme Court did not serve as an obstacle this time around. Table 2 shows that several legislators that belonged to the parties of Lula's governing coalition, including some from his own PT, voted against the pension reform. Lula received only 213 votes from within the governing coalition (which at the time included PDT instead of PMDB), a figure far short of the extraordinary majority necessary to pass a constitutional reform.

#### [TABLE 2 ABOUT HERE]

Consequently, Lula also needed support from opposition parties like the PSDB and PFL, as well as the PMDB, for this initiative to be successful. As Table 2 demonstrates, Lula received more than enough support from parties outside the governing coalition. Why did the opposition help with Lula's initiative to reform the pension system? In the case of the core opposition (PSDB and PFL), the reforms were congruous with their own policy agenda. However, we would also expect the opposition to demonstrate some reluctance in supporting a political enemy so early in his term on a very controversial issue, regardless of the policy content. Support from the opposition should have been rather inelastic due to the high stakes generated by the stage of the game, the importance of the issue, and the potential for drastic political losses.

Table 3 provides the other means by which Lula was able to overcome resistance from outside the governing coalition in the process of building a winning coalition for this particular piece of legislation. Again balancing political and monetary transfers around the time of the social security vote, Lula made a choice to send pork expenditures overwhelmingly outside the governing coalition, with about 41% of all such expenditures going to PSDB and PFL alone. Furthermore, as shown in Table 4, collective amendments (i.e., pork for states rather than individual legislators) were disbursed almost entirely to states governed by parties outside the governing coalition in 2003. Both patterns stand in stark contrast to the patterns observed for 2004 and 2005 – a period of more "normal" politics.<sup>14</sup>

<sup>&</sup>lt;sup>14</sup>Importantly, the budget for 2003 was created by the previous administration in 2002. However, Lula had discretion over whether he would actually disburse the individual and collective amendments. Therefore, while institutional momentum in 2003 perhaps explains some of the discrepancy, Lula also made a choice to

#### [TABLE 3 ABOUT HERE]

Lula's apparent strategy early on was to over-reward his own fractured party with political transfers and to lavish monetary benefits on more ideologically distant parties within the governing coalition but particularly on parties outside the formal governing coalition. Lula also seemed to count on a honeymoon boost in that first year, as overall expenditures on pork for individuals in 2003 (26.65 billion) were significantly less than in 2004 (44.58 billion) and 2005 (50.33 billion). Certainly, Lula's political capital did erode throughout that first year, with a steady decline in public approval throughout and a bottoming out of legislative support in August 2003. This eroded political capital likely necessitated the increase in pork expenditures.

#### [TABLE 4 ABOUT HERE]

## 6 Discussion

We have developed a formal model of bargaining and exchange in multiparty presidential regimes that simultaneously considers political transfers, monetary transfers, and policy concessions – thereby permitting examination of aspects of executive-legislative relations that have gone unexplored in literatures focused on parliamentary regimes and the U.S. twoparty case. The model provides useful information about the circumstances under which political or monetary transfers will be more useful to the executive given the distribution of factions in the legislature. In particular, the executive is better off using political transfers in exchange for support from factions that are ideologically similar to the executive and better off using monetary transfers when obtaining support from more ideologically distant factions. As an illustration, awarding cabinet positions to ideologically distant legislators may permit these legislators to pursue their own (ideologically different) policy agendas from within the bureaucracy. This is clearly an undesirable outcome for an executive.

The model also suggests that the optimal strategy for building a formal governing coalition depends on expectations about future bargaining conditions. While one might expect certain efficiencies if an executive can build a winning coalition that is ideologically compact, the model suggests that the optimal strategy will sometimes tend in the other direction. An executive who expects that future bargaining largely will involve monetary transfers can optimize by building a coalition with a high degree of ideological heterogeneity, particularly if the legislative factions in question are only weakly ideological.

distribute the pork in this manner.

The empirical evidence from the Brazilian case is strongly supportive of the modeling results. Under more normal conditions, Lula used political transfers to maintain support from more ideologically similar members of the governing coalition and monetary transfers to maintain support from more ideologically distant parties. The more severe conditions of Lula's first year as president also provide supportive evidence, with Lula sending much of the monetary transfers outside the governing coalition. Additionally, Lula's choice of an ideologically heterogeneous coalition fits with the weakly ideological nature of Brazilian political parties and the value of pork to legislators.

Logrolling has emerged as an inter-temporal solution to the problems of bargaining contemporaneously in the two-party case of the U.S. (especially under divided government), but the existence of multiple viable legislative parties changes the structure of the game considerably. While the Brazilian case seems an excellent choice for application of the formal model to a multiparty context, work remains in determining the extent to which other institutional and sociopolitical contexts produce empirical results in fitting with the model. The world's multiparty presidential regimes are rather heterogeneous themselves.

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## 8 Appendix

Solution of the general bargaining between the executive and a faction  $(a, \mu)$  where  $x(a) < \frac{1}{2}$ .

$$\max_{\{x,m,p\}} \left[ U_e\left(x,m,p\right) - U_e^{sq} \right]^{\theta} \left[ U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq} \right]^{1-\theta}$$
(24)

subject to  $U_e(x, m, p) \ge U_e^{sq}$ ,  $U_{(a,\mu)}(x, m, p) \ge U_{(a,\mu)}^{sq}$ ,  $m \ge 0$ , and  $p \ge 0$ . The Lagrangian is

$$\mathcal{L} = [U_e(x,m,p) - U_e^{sq}]^{\theta} \left[ U_{(a,\mu)}(x,m,p) - U_{(a,\mu)}^{sq} \right]^{1-\theta} + \phi_m m + \phi_p p + (25) \lambda_e \left[ U_e(x,m,p) - U_e^{sq} \right] + \lambda_a \left[ U_{(a,\mu)}(x,m,p) - U_{(a,\mu)}^{sq} \right],$$

where

$$U_{e}(x,m,p) = -(1-x) - \beta_{m}^{e}\mu m - \beta_{p}^{e}f(a)\mu p, \qquad (26)$$
$$U_{e}^{sq} = -1,$$
$$U_{(a,\mu)}(x,m,p) = -h(a)[x-x(a)]^{2} + \beta_{m}^{l}m + \beta_{p}^{l}p,$$
$$U_{(a,\mu)}^{sq} = -h(a)[x(a)]^{2}.$$

Clearly, because  $\theta \in (0, 1)$ , the solution to (24) satisfies  $U_e(x, m, p) > U_e^{sq}$ , and  $U_{(a,\mu)}(x, m, p) > U_{(a,\mu)}^{sq}$ . Precisely, the executive can always choose  $x \in [x(0), x(a)]$  and makes no transfers. In this way it increases its utility and the utility of faction  $(a, \mu)$ . This implies that  $\lambda_e = \lambda_a = 0$ . As a result, we obtain

$$\frac{\partial \mathcal{L}}{\partial x} = \left[\frac{U_e\left(x,m,p\right) - U_e^{sq}}{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}\right]^{\theta} \left[\begin{array}{c} \theta \frac{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}{U_e\left(x,m,p\right) - U_e^{sq}} \frac{\partial U_e\left(x,m,p\right)}{\partial x} + \\ \left(1 - \theta\right) \frac{\partial U_{(a,\mu)}\left(x,m,p\right)}{\partial x} \end{array}\right] = 0.$$
(27)

Moreover,

$$\frac{\partial \mathcal{L}}{\partial m} = \left[\frac{U_e\left(x,m,p\right) - U_e^{sq}}{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}\right]^{\theta} \left[\begin{array}{c} \theta \frac{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}{U_e\left(x,m,p\right) - U_e^{sq}} \frac{\partial U_e\left(x,m,p\right)}{\partial m} + \\ \left(1 - \theta\right) \frac{\partial U_{(a,\mu)}\left(x,m,p\right)}{\partial m} \end{array}\right] + \phi_m = 0, \quad (28)$$

and

$$\frac{\partial \mathcal{L}}{\partial p} = \left[\frac{U_e\left(x,m,p\right) - U_e^{sq}}{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}\right]^{\theta} \left[\begin{array}{c} \theta \frac{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}{U_e\left(x,m,p\right) - U_e^{sq}} \frac{\partial U_e\left(x,m,p\right)}{\partial p} + \\ \left(1 - \theta\right) \frac{\partial U_{(a,\mu)}\left(x,m,p\right)}{\partial p} \end{array}\right] + \phi_p = 0.$$
(29)

We first consider a scenario with positive political transfers, that is p > 0. This implies that  $\phi_p = 0$  and

$$\frac{\partial \mathcal{L}}{\partial x} = \theta \frac{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}{U_e\left(x,m,p\right) - U_e^{sq}} \frac{\partial U_e\left(x,m,p\right)}{\partial x} + (1-\theta) \frac{\partial U_{(a,\mu)}\left(x,m,p\right)}{\partial x} = 0 \quad (30)$$

$$\frac{\partial \mathcal{L}}{\partial p} = \theta \frac{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}{U_e\left(x,m,p\right) - U_e^{sq}} \frac{\partial U_e\left(x,m,p\right)}{\partial p} + (1-\theta) \frac{\partial U_{(a,\mu)}\left(x,m,p\right)}{\partial p} = 0 \quad (31)$$

Together, (30) and (31) imply that

$$\frac{\theta}{1-\theta}\frac{U_{(a,\mu)}\left(x,m,p\right)-U_{(a,\mu)}^{sq}}{U_{e}\left(x,m,p\right)-U_{e}^{sq}} = -\frac{\frac{\partial U_{(a,\mu)}(x,m,p)}{\partial x}}{\frac{\partial U_{e}(x,m,p)}{\partial x}} = -\frac{\frac{\partial U_{(a,\mu)}(x,m,p)}{\partial p}}{\frac{\partial U_{e}(x,m,p)}{\partial p}}.$$
(32)

After some algebra, we obtain

$$x(a,\mu) = x(a) + \frac{\beta_p^l}{\beta_p^e} \frac{1}{2h(a) f(a) \mu}.$$
(33)

We claim that monetary transfers are equal to zero when political transfers are positive. The proof is by contradiction. Assume that m > 0. Then  $\phi_m = 0$  and

$$\frac{\partial \mathcal{L}}{\partial x} = \theta \frac{U_{(a,\mu)}(x,m,p) - U_{(a,\mu)}^{sq}}{U_e(x,m,p) - U_e^{sq}} \frac{\partial U_e(x,m,p)}{\partial x} + (1-\theta) \frac{\partial U_{(a,\mu)}(x,m,p)}{\partial x} = 0 \quad (34)$$

$$\frac{\partial \mathcal{L}}{\partial m(a_{\mu})} = \theta \frac{U_{(a,\mu)}(x,m,p) - U_{(a,\mu)}^{sq}}{U_e(x,m,p) - U_e^{sq}} \frac{\partial U_e(x,m,p)}{\partial m} + (1-\theta) \frac{\partial U_{(a,\mu)}(x,m,p)}{\partial m} = 0$$
(35)

Together, these conditions imply that

$$\frac{\theta}{1-\theta}\frac{U_{(a,\mu)}\left(x,m,p\right)-U_{(a,\mu)}^{sq}}{U_{e}\left(x,m,p\right)-U_{e}^{sq}} = -\frac{\frac{\partial U_{(a,\mu)}\left(x,m,p\right)}{\partial x}}{\frac{\partial U_{e}\left(x,m,p\right)}{\partial x}} = -\frac{\frac{\partial U_{(a,\mu)}\left(x,m,p\right)}{\partial m}}{\frac{\partial U_{e}\left(x,m,p\right)}{\partial m}}.$$
(36)

After some manipulation, we obtain

$$x(a,\mu) = x(a) + \frac{\beta_m^l}{\beta_m^e} \frac{1}{2h(a)\mu}.$$
(37)

Note that (33) and (37) are satisfied if and only if

$$\frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l} = f(a) \,. \tag{38}$$

The equality in (38) only occurs non-generically that is, in a set of parameters of measure zero. As a result, it must be the case that m = 0. Now, if m = 0,  $\phi_m \ge 0$  and (28) implies

$$-\frac{\theta}{1-\theta} \frac{U_{(a,\mu)}(x,m,p) - U_{(a,\mu)}^{sq}}{U_e(x,m,p) - U_e^{sq}} \beta_m^e \mu + \beta_m^l \le 0.$$
(39)

Substituting  $\frac{\theta}{1-\theta} \frac{U_{(a,\mu)}(x,m,p) - U_{(a,\mu)}^{sq}}{U_e(x,m,p) - U_e^{sq}}$  with  $-\frac{\frac{\partial U_{(a,\mu)}(x,m,p)}{\partial p}}{\frac{\partial U_e(x,m,p)}{\partial p}}$  (see (32)), and after some manipulation, we can rewrite (39) as

$$\frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l} \ge f(a) \,. \tag{40}$$

We can obtain the amount of political transfers from (32), that is

$$\frac{\theta}{1-\theta} \frac{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}{U_e\left(x,m,p\right) - U_e^{sq}} = -\frac{\frac{\partial U_{(a,\mu)}\left(x,m,p\right)}{\partial x}}{\frac{\partial U_e\left(x,m,p\right)}{\partial x}}.$$
(41)

After some computation, we obtain

$$p(a,\mu) = \frac{1}{\beta_p^l} h(a) x_p(a,\mu) \left[ (1-\theta) x_p(a,\mu) - x(a) \right],$$
(42)

where (as obtained in (33))

$$x_{p}(a,\mu) = x(a) + \frac{\beta_{p}^{l}}{\beta_{p}^{e}} \frac{1}{2h(a)f(a)\mu}.$$
(43)

Finally, note that  $p(a, \mu) > 0$  if and only if

$$\frac{\beta_p^e}{\beta_p^l} < \frac{1-\theta}{\theta} \frac{1}{2x(a)h(a)f(a)\mu}.$$
(44)

We now consider the scenario where monetary transfers are positive. As seen above, when monetary transfers are positive,

$$x_m(a,\mu) = x(a) + \frac{\beta_m^l}{\beta_m^e} \frac{1}{2h(a)\mu}.$$
 (45)

A reasoning similar to the one for the case of political transfers implies that, when monetary transfers are positive, political transfers are equal to zero. As a result,  $\phi_p \ge 0$ , and

$$-\frac{\theta}{1-\theta}\frac{U_{(a,\mu)}(x,m,p) - U_{(a,\mu)}^{sq}}{U_e(x,m,p) - U_e^{sq}}\beta_p^e f(a)\mu + \beta_p^l \le 0.$$
(46)

Substituting  $\frac{\theta}{1-\theta} \frac{U_{(a,\mu)}(x,m,p) - U_{(a,\mu)}^{sq}}{U_e(x,m,p) - U_e^{sq}}$  with  $-\frac{\frac{\partial U_{(a,\mu)}(x,m,p)}{\partial m}}{\frac{\partial U_e(x,m,p)}{\partial m}}$  (see (36)), and after some manipulation, we can rewrite (46) as

$$\frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l} \le f(a) \,. \tag{47}$$

We can obtain the amount of monetary transfers from (36), that is

$$\frac{\theta}{1-\theta} \frac{U_{(a,\mu)}\left(x,m,p\right) - U_{(a,\mu)}^{sq}}{U_e\left(x,m,p\right) - U_e^{sq}} = 2h\left(a\right)\left[x - x(a)\right].$$
(48)

Precisely, it is equal to

$$m(a,\mu) = \frac{1}{\beta_m^l} h(a) x_m(a,\mu) \left[ (1-\theta) x_m(a,\mu) - x(a) \right].$$
(49)

Clearly,  $m(a, \mu) > 0$  if and only if

$$\frac{\beta_m^e}{\beta_m^l} < \frac{1-\theta}{\theta} \frac{1}{2x(a)h(a)\mu}.$$
(50)

**Proof of Lemma 1**: All derivatives are straightforward with the exception of  $\frac{\partial p(a_d, \mu_d)}{\partial a_d}$ , which we consider in more detail. We obtain

$$\frac{\partial p\left(a_{d},\mu_{d}\right)}{\partial a_{d}} = \frac{1}{\beta_{p}^{l}} \left\{ \left[2\left(1-\theta\right)x_{p}\left(a_{d},\mu_{d}\right)-x\left(a_{d}\right)\right]\frac{\partial x_{p}\left(a_{d},\mu_{d}\right)}{\partial a_{d}} - x_{p}\left(a_{d},\mu_{d}\right)\frac{\partial x\left(a_{d}\right)}{\partial a_{d}}\right\}.$$
 (51)

After some computation, we have that  $\frac{\partial p(a_d,\mu_d)}{\partial a_d} < 0$  whenever

$$\theta > \frac{\beta_p^l}{2f(a_d)\,\mu_d \beta_p^e} \frac{\frac{\partial x(a_d)}{\partial a_d} - \left[x(a_d) + \frac{\beta_p^l}{f(a_d)\mu_d \beta_p^e}\right] \frac{f'(a_d)}{f(a_d)}}{2\left[x(a_d) + \frac{\beta_p^l}{2f(a_d)\mu_d \beta_p^e}\right] \left[\frac{\partial x(a_d)}{\partial a_d} - \frac{\beta_p^l}{2f(a_d)\mu_d \beta_p^e} \frac{f'(a_d)}{f(a_d)}\right]}$$
(52)

Moreover, (7) states that a necessary condition for positive political transfers to occur is that

$$\frac{\beta_p^e}{\beta_p^l} < \frac{1-\theta}{\theta} \frac{1}{2f(a_d) x(a_d) \mu_d},\tag{53}$$

which can be rewritten as

$$\theta < \frac{\frac{\beta_p^l}{2f(a_d)\mu_d\beta_p^e} \frac{1}{x(a_d)}}{1 + \frac{\beta_p^l}{2f(a_d)\mu_d\beta_p^e} \frac{1}{x(a_d)}}.$$
(54)

Finally, the right hand side of (52) is smaller than the right hand size of (54) if and only if

$$\frac{x'(a_d)}{x(a_d)} > -\frac{f'(a_d)}{f(a_d)}.$$
(55)

**Proof of Lemma 2**: All derivatives are straightforward with the exception of  $\frac{\partial m(a_{dd}, \mu_{dd})}{\partial a_d}$ , which we consider in more detail. Note that  $\frac{\partial m(a_{dd}, \mu_{dd})}{\partial a_d} < 0$  if and only if

$$\frac{\partial x_m^*(a_{d\mu_d})}{\partial a_d} \left[ (1-\theta) \, x_m \left( a_d, \mu_d \right) - x(a_d) \right] + x_m \left( a_d, \mu_d \right) \left[ (1-\theta) \, \frac{\partial x_m \left( a_d, \mu_d \right)}{\partial a_d} - \frac{\partial x \left( a_d \right)}{\partial a_d} \right] < 0.$$
(56)

Using (11), after some computation, we can rewrite this inequality as

$$\theta > \frac{\frac{1}{2} \frac{\beta_m^l}{\beta_m^m} \frac{1}{2x(a_d)\mu_d}}{1 + \frac{\beta_m^l}{\beta_m^m} \frac{1}{2x(a_d)\mu_d}}.$$
(57)

Moreover, (10) states that a necessary condition for positive political transfers to occur is that

$$\frac{\beta_m^e}{\beta_m^l} < \frac{1-\theta}{\theta} \frac{1}{2x(a_d)\mu_d},\tag{58}$$

which can be rewritten as

$$\theta < \frac{\frac{\beta_m^l}{\beta_m^m} \frac{1}{2x(a_d)\mu_d}}{1 + \frac{\beta_m^l}{\beta_m^m} \frac{1}{2x(a_d)\mu_d}}.$$
(59)

Proof of Proposition 1: The proof is straightforward. First, all factions receive exogenous transfers. Moreover, since  $x(a_c) \geq \frac{1}{2}$ , the preferences of the leader of the faction  $(a_c, \mu_c)$  are aligned with the executive's agenda, and the faction does not receive (additional) transfers. Consider now the distant faction  $(a_d, \mu_d)$ . Since f(a) is strictly decreasing in a, and  $f(0) > \frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l} > f(\tilde{a})$ , there exists a'' such that  $f(a'') = \frac{\beta_m^e}{\beta_m^l} / \frac{\beta_p^e}{\beta_p^l}$ . If  $a_d \leq a''$ , (10) implies that only monetary transfers occur, the political agenda is  $x_m(a, \mu)$ , and the level of monetary transfers occur, the political agenda is  $p(a, \mu)$ .



Figure 1: Choice of a Coalition

Political Party	# of Cabinet Posts	% of Cabinet Posts	# of Chamber Seats	% of Chamber Seats	Post-Seat Disparity	% of Individual Pork	Ideological Distance from PT
PT	21	60.00	91	28.62	31.38	7.37	0.00
PSB	1	2.86	20	6.29	-3.43	1.58	0.57
PC do B	2	5.71	9	2.83	2.88	1.56	0.61
PPS	1	2.86	20	6.29	-3.43	4.41	1.38
PMDB	2	5.71	78	24.53	-18.82	17.20	3.91
PL	1	2.86	43	13.52	-10.66	10.16	4.67
PTB	1	2.86	51	16.04	-13.18	12.52	4.69
PV	1	2.86	6	1.89	0.97	1.56	
Ind.	5	14.29					
Totals	35		318			56.36	

Table 1. Lula's Coalition Management (January 2004 – July 2005)

**NOTES:** Data on cabinet posts come from Amorim Neto (2007). The "Post-Seat Disparity" is the percentage of cabinet posts minus the percentage of within-coalition Chamber seats. Negative values indicate that a party has received a disproportionately low percentage of cabinet posts, while positive values indicate a disproportionately high percentage of cabinet posts. The "% of Individual Pork" refers to the individual budgetary amendments actually disbursed to members of the political party, as a percentage of all such disbursements over the stated timeframe. The source of the budgetary data is the *Controladoria de Orçamentos, Fiscalização e Controle do Senado Federal* in Brazil. The "Ideological Distance from PT" is calculated based on data collected in elite surveys for the year 2001. Party switching by individual legislators created minor alterations in the number of Chamber seats throughout the period under examination.

Figure 2: Table 1

Party	Yes	No	Total
PCdoB	7 (64%)	4 (36%)	11
PDT	6 (50%)	6 (50%)	12
PL	39 (100%)	0 (0%)	39
PPS	17 (100%)	0 (0%)	17
PSB	18 (90%)	2 (10%)	20
PT	80 (95%)	4 (5%)	84*
PTB	42 (84%)	8 (16%)	50
PV	4 (80%)	1 (20%)	5
PFL	32 (48%)	34 (52%)	66
PMDB	49 (72%)	19 (28%)	68
PMN	1 (100%)	0 (0%)	1
PP	32 (70%)	14 (30%)	46
PRONA	0 (0%)	6 (100%)	6
PSC	1 (100%)	0 (0%)	1
PSDB	28 (53%)	25 (47%)	53
PSL	1 (100%)	0 (0%)	1
Totals	357 (74%)	123 (26%)	480

 Table 2.
 Roll Call Votes on Social Security Reform (August 2003)

**NOTES:** Pro-government coalition parties are PCdoB through PV. The government's position for the roll call vote was "Yes."

\* Seven PT members also abstained from voting.

Figure 3: Table 2

Time Period	Total Individual Amendments Disbursed	Disbursed to Coalition Partners	%	Disbursed to Other Parties	%	Disbursed to PSDB & PFL	%
July 2003	2,595,576,925	623,987,927	24.04	1,971,588,998	75.96	1,065,919,786	41.07
Aug. 2003	2,496,032,995	597,001,913	23.92	1,899,031,082	76.08	1,020,626,703	40.89
Sept. 2003	1,286,218,066	314,399,761	24.44	971,818,305	75.56	523,195,186	40.68
Oct. 2003	3,726,790,585	882,921,612	23.69	2,843,868,973	76.31	1,531,699,367	41.10
Subtotal	10,104,618,571	2,418,311,213	23.93	7,686,307,358	76.07	4,141,441,042	40.99
2003	26,652,992,685	6,477,287,423	24.30	20,175,705,262	75.70	10,829,918,727	40.63
2004	44,582,204,598	25,010,126,489	56.10	19,572,078,109	43.90	10,988,202,757	24.65
2005	50,326,707,329	29,573,133,642	58.76	20,753,573,687	41.24	12,438,801,369	24.72

Table 3. Monetary Transfers Inside and Outside the Governing Coalition

**NOTES:** The social security reform passed in August 2003. The coalition partners for 2004 are as shown in *Table 1*. For 2003, PDT takes the place of PMDB in the governing coalition. PPS left the coalition in July 2005. PP is included in the coalition for October-December 2005.

Figure 4: Table 3

2003			
States Governed by Coalition Parties	61,705,398	10.57%	
States Governed by Non-coalition Parties	521,869,595	89.43%	
States Governed by PSDB & PFL	195,858,524	33.56%	
Total	583,574,993		
2004			
States Governed by Coalition Parties	128,724,818	95.89%	
States Governed by Non-coalition Parties	5,522,588	4.11%	
States Governed by PSDB & PFL	4,733,689	3.53%	
Total	134,247,406		

## Table 4. Collective Monetary Transfers by Amount and %

Figure 5: Table 4