The Political Economy of Ordinary Politics: Presidential-Legislative Relations in Multiparty Settings

Paulo Melo-filho  
*Universidad Carlos III de Madrid*

Cesar Zucco  
*Istituto Universitario de Pesquisas do Rio de Janeiro (IUPERJ)*

*Abstract*

We address the problem of how presidents who control considerable political resources use these to obtain legislative support in multiparty legislatures. We present a formal model of executive-legislative relations in which presidents buy votes from parties and/or individual legislators and seek to minimize the costs of coalition-formation. The model's most general result is that presidents negotiate deals with individual legislators even if economies of scale exist in bargaining with parties as a whole. We show that this result has important political implications and test the model's specific and simultaneous predictions about cabinet composition, patterns of pork distribution, and party behavior against ten years of data from Brazil. The empirical results show that presidents generally act as cost minimizers, and that their levels of legislative support dwindles whenever they deviate from the model's predictions.

*Submitted:* June 29, 2009.
The Political Economy of Ordinary Politics:

Presidential-Legislative Relations in Multiparty Settings*

Cesar Zucco Jr.  
Instituto Universitário de Pesquisas do RJ  
Rio de Janeiro, Brazil  
czucco@iuperj.br

Paulo Melo-Filho  
Departamento de Economía  
Universidad Carlos III, Spain  
pfilho@eco.uc3m.es

June 16, 2009

Approx. Word Count: 12808 (text) + 1016 (bibliography)

Abstract

We address the problem of how presidents who control considerable political resources use these to obtain legislative support in multiparty legislatures. We present a formal model of executive-legislative relations in which presidents buy votes from parties and/or individual legislators and seek to minimize the costs of coalition-formation. The model’s most general result is that presidents negotiate deals with individual legislators even if economies of scale exist in bargaining with parties as a whole. We show that this result has important political implications and test the model’s specific and simultaneous predictions about cabinet composition, patterns of pork distribution, and party behavior against ten years of data from Brazil. The empirical results show that presidents generally act as cost minimizers, and that their levels of legislative support dwindles whenever they deviate from the model’s predictions.

*The authors thank Jeff Lewis, Tim Groseclose, David Levine, Jean-Laurent Rosenthal and Barbara Geddes for valuable comments. Previous versions of this paper have been presented at seminars at UCLA’s Political Science and Economics Department, Nuffield College, UC-Riverside, and at meetings of the American Political Science Association and Econometric Society. Zucco gratefully acknowledges financial support from the Ministry of Education of Brazil (CAPES grant BEX-1489-9) and Melo-Filho from the Ministry of Science and Technology of Brazil (CNPq grant 200167/1999-5) and from the Ministry of Science and Technology of Spain (Project SEJ2005-08462).
Presidents need legislative support to govern effectively and to fulfill their campaign promises. However, in Latin American multiparty systems, presidents frequently lack legislative majorities. In order to forge and maintain the coalitions that will support them, presidents can either compromise on policy or offer side payments in order to secure legislative support for their own agendas. This paper rests on the assumption that the strategic use of resources under presidents’ control to obtain legislative support is a central aspect of executive-legislative relations, at least as important as ideology and policy compromises.

But how do presidents decide who to allocate resources to? What mix of resources, among the many controlled by the executive, should be used? Should the president seek to buy party votes as a block, or target individual legislators? Though many such questions have been previously asked, we still lack a unified approach that can answer these questions simultaneously.

In this paper, we seek to fill this void with a formal model of the president’s resource allocation decision in multiparty settings. The model is based on a rather simple cost minimization assumption and shows that whenever possible, presidents will bargain not only with parties, but also directly with individual legislators. We apply the model to a concrete case to show that it yields quite realistic results. Apparently, presidents do indeed follow a cost-minimization strategy.

1 Winning hearts and minds in Congress

Coalition formation within legislatures frequently involves trading resources for votes or — more bluntly — “vote buying”. In what we take to be the culmination of a long research tradition in legislative coalition formation in the U.S. context, Groseclose & Snyder Jr (1996) claim that cost-effectiveness, rather than ideology (Axelrod 1970) or universalism (Weingast 1979), explains why super-majorities form so often in the U.S. Congress when the classical works predicted that minimal winning coalitions should be prevalent (Riker 1962, Shepsle 1974, Baron & Ferejohn 1989).

Like Groseclose and Snider, we assume that minds — if not hearts — can be bought in-
side legislatures, and we also share their interest in the costs of coalition building. However, the disproportionate share of resources presidents control in Latin American countries renders their setup with two competing vote-buyers inappropriate. Latin American presidents control proportionally more politically important resources while facing considerably weaker legislative branches than their North American counterpart. Resources such as high-level appointments and extensive control over the execution of the budget that entails control over the provision of *pork* to individual legislators can be “invested” in a range of activities, from building an effective bureaucracy to securing support — or at least acquiescence — from other political elites. If one adds constitutional procedural prerogatives and superior technical expertise to his resource-monopoly, it becomes clear that the president occupies such a privileged position that he can be considered, in effect, the sole vote buyer.\(^1\)

Despite this privileged position, presidents should prefer to spend the minimum possible amount of their resources in coalition building, while freeing as much resources as possible for “electoral investments”, understood as any activity that will improve their popular support.\(^2\) Whatever the presidents’ ultimate goals, from advancing their own careers to securing their place in history (Geddes 1994), it makes immediate sense to focus on improving their reputations and increasing electoral capital. Obviously, electoral and coalitional investments are not always necessarily at odds with each other, but we *assume* that any president would rather spend more on the former and less on the latter, if possible.

If it is relatively uncontroversial that presidents use at least part of the resources at their disposal to obtain legislative support, the same cannot be said of how this process works. Presidents, especially in multiparty systems, are confronted with a wide range of potential beneficiaries, and have to decide which resources to use and with whom these resources will be

\(^1\)We should acknowledge that this statement is not uncontroversial, as some would claim that lobby groups can also act as vote buyers in Congress (Palanza 2008). Though this is potentially true, we believe it is restricted to some specific votes and issues. There is no office or group that can rival the president’s overall power to influence results of legislative votes.

\(^2\)Considerable work has recently been done on public expenditures as an electoral investment (Schady 2000, Calvo & Murillo 2004, Diaz-Cayeros, Magalon & Estévez Forthcoming). As Diaz-Cayeros & Magaloni (2003) have shown, electoral investments will generally include the provision of a mix of local public and private goods to the electorate. The exact mix to be provided depends, among other things, on the levels of political competition and economic development.
shared with.

It has been shown that cabinet positions and other key posts in the bureaucracy are typically allocated to parties or collective groups of legislators (Deheza 1997, Amorim Neto 1998, Altman 2000), and even that governments that intend to legislate through the regular statutory process as opposed to as governing by decree, aim at distributing cabinet positions proportionally to the strength of the parties in the coalition (Amorim Neto 2006). Media coverage of Brazilian politics, for example, provides many instances of parties requesting greater cabinet representation, while many former cabinet members in Bolivia and Uruguay pointed out in interviews that they had not been ministers on their own right, but rather served in the cabinet as “men of their party.”

Nonetheless, in parallel to this party-based portfolio distribution, in some countries at least, the idea that the bargaining between presidents and individual legislators is central to politics is very widespread. In Brazil, for instance, increasing scholarly attention has been devoted to the government efforts to buy-off legislators with pork and other particularistic benefits (Ames 1987, Ames 2001, Samuels 2003, Pereira & Muller 2004). In Ecuador, Mejía Acosta (2004) argued that presidents were forced into negotiation with individual legislators and into “ghost” coalition making because of the high costs parties pay for being associated with the government. In Bolivia, the importance of individual legislators vis-a-vis parties increased dramatically toward the end of the 90s, and particularistic benefits beyond cabinet positions were considered the glue that held together very disparate and heterogenous coalitions (Mayorga 2006).

Until now, most studies have either analyzed these modes of bargaining separately, as both the cabinet formation and the individual vote buying literature do, or ambiguously, treating parties and legislators interchangeably (Alston & Mueller 2006). A noteworthy exception is the recent paper by Pereira, Power & Raile (2006), who call attention to the existence of a presidential “tool box” and different styles of coalition management. Their paper, however, is

3However, not everyone shares this view. In what is probably the majority position among Brazilian scholars, Figueiredo & Limongi claim that parties play a much greater role than commonly assumed. Based on a research agenda that spans more than 15 years (see, for instance, Figueiredo & Limongi 1999) the authors state that the concentration of power in the executive and the centralization of power inside the legislature “make any individual action by legislators innocuous.” In this context, “the rational course of action for legislators is to act through parties” (Figueiredo & Limongi 2002, p.306), rather than to bargain directly with the executive.
purely empirical. There is, by now, ample evidence that both the distribution of individual
benefits and resource allocation to parties matter to how legislators behave (Zucco Jr. 2009),
but we still do not know how the observed distribution of resources comes into being.

One difficulty seems to be that taking parties and legislators simultaneously into account
forces one to consider number, size, cohesion, and position of parties, as well as to theorize
about what parties effectively do. The problem can quickly becomes intractable, as multiple
interactions between these variables make their final effects hard to disentangle, offering no
clear insights into how party system characteristics affect the distribution of resources. In this
context it is very hard to determine, for instance, whether it is cheaper to buy off many small
disciplined parties or fewer undisciplined parties.

To deal with this difficulty, and to allow for generalizations beyond a single country case,
we propose a stylized depiction of the president’s decision environment that attempts to isolate
ideology from the more mundane vote buying, on which the model concentrates. Our model
differs from those that inspired it (Cox & McCubbins 1986, Dixit & Londregan 1996) in that
the sole vote buyer — the president — holds and distributes two different types of goods —
one that suits collectives and another that suits individuals. In our model, parties are simply
another mechanism for channeling resources from the executive to legislators. While all of these
assumptions are debatable, we believe the realism of the model’s predictions supports our case,
and we make our case confronting the predicted optimal resource distribution to what is actually
observed in a concrete case.

2 The Model

The model’s constituent parts are a president, legislators grouped in parties, and “political
goods” which are transferred according to a certain “technology”. The president — the sole
vote buyer — faces a legislature composed of parties, which are depicted as distributions of
individuals with some exogenously defined level of ideological aversion towards the government
that defines their ex ante propensity to vote against the president’s position on any given
Each legislator can be placed on this ideological scale, becoming then indexed by her ideological aversion towards the president. With no transfers, there will be some cut-point in the ideological aversion scale that separates those who support and those who oppose the president. By transferring resources under his control to parties and/or directly to legislators, the president increases legislators’ utility and draws more legislators to his side of the cut-point, thus “buying” the votes he needs in order to pass legislation. The president’s problem, in this scenario, is to decide, given the ex ante ideological aversion towards him, how each of his political goods should be allocated in order to minimize the total costs of securing a certain level of support.

Legislators: Legislators decide how to vote based on political goods they receive from the president, and on their ideological aversion to the president, which is an exogenously set bias of the legislator with respect to the president represented by $X$.

Here, notation deserves special attention. Ideological aversion is measured on a scale in which higher values indicate greater distance from the president, and consequently a larger bias against the president.

We assume legislator’s voting behavior is determined exclusively by the benefits received and how she votes, not being directly affected by policy. With $C$ representing the level of political benefits received by a legislator, her utility is defined as:

$$U = \begin{cases} 
 v(C) + X & \text{if voting against the president} \\
 v(C) & \text{if voting with the president,}
\end{cases}$$

---

4 For clarity, the pronouns in this paper are feminine for legislators and masculine for the president.
5 For ease of presentation, we first present a simplified version of the model assuming only one type of political good, and then present the complete model with two types of goods.
6 This implies that legislators do not care about the outcome of the vote, which we believe is an empirically sound assumption. Typically, since the president is the de facto main legislator in all Latin American countries, he, and not legislators, is held accountable for policy outcomes. Legislators are generally evaluated by their local constituencies, which tend to be more concerned with local service. In this sense Pereira & Rennó (2003), for instance, showed that local concerns — including the capacity to “deliver” — are generally the most important factor driving the reelection of legislators. To the extent that policy matters, occasionally particular votes are of interest to unions or other organized pressure groups, which might try to shame legislators for how they voted, but not for the policy outcome itself.
with \( v(0) = 0, v'(C) > 0 \) and \( v''(C) < 0 \).

For any given level of political benefits provided, a legislator for whom \( X > 0 \) would prefer to vote against the president. However, such a legislator would be willing to vote with the president \emph{in exchange} for receiving some \( C > 0 \), as long as \( v(C) - X \geq 0 \).

**Parties:** Legislators are divided into \( J \) identifiable parties, with each legislator belonging to only one party. Each party is composed of a continuum of legislators with mass \( N_j > 1 \), whose ideological aversion levels (\( X \)'s) are distributed according to the density function \( \phi_j(X) \) (with cdf \( \Phi_j(X) \)). The distribution of legislators among parties and, therefore, the aversion distributions for the different parties are exogenous.

**Political Favors:** In the single-good model, the president only controls the allocation of \emph{club goods} (\( M \)). These club goods are allocated to parties (collectively) and benefit all of its members. Though this is not necessarily a straight-out cash transfer, it has a political value and a monetary equivalent that can be continuously set by the president. This type of good is intended to represent cabinet positions or other high level appointments that can benefit the party as a whole. In the real world, these jobs actually go to specific people, thus benefiting some legislators more than others. However, the important points are that the president negotiates how to allocate these resources with the party, and not with individual legislators, and that ministers use their positions to hire co-partisans and provide other political resources for their party.

In the two-goods model, in addition to club goods the president also controls the allocation of \emph{private goods}, the provision of both of which depend on his discretionary decision. Differently than with club goods, private goods are allocated individually, and only benefit the recipient. These \emph{private} goods can be thought of as pork. Though from the perspective of voters pork

---

\(^7\)For simplicity, we assume that whenever a legislator is indifferent, she votes with the president.

\(^8\)Though we refer to parties, these could be thought of as any kind of political groups, such as parties, regional caucuses, or factions.

\(^9\)In this respect, many interviews we conducted with former cabinet members in three countries, as much of the media coverage in these countries suggest that ministries are, in fact, a collective affair. Except for apolitical nominations, ministries are always allocated to parties or at least to some significant and identifiable group within a party.
usually is a local public good, as far as other legislators are concerned it only yields electoral benefits to the individual legislator who can claim credit for it.

**Transfer Technology:** From the president’s perspective, the main difference between these two goods is their respective “transfer technology”. For club goods, when the president provides $M_j$ to party $j$, each legislator in that party receives the same amount $m_j = \mu_j(M_j)$, where $\mu_j(0) = 0$ and $\frac{1}{N_j} < \mu_j'(M_j) < 1$. This *transfer technology* captures both the club nature of the good and the idea that there are economies of scale in providing of goods to parties. For the private goods, we assume the amount received by the individual legislator is exactly equal to the amount transferred by the president.

From the legislator’s perspective, political benefits are additive. Therefore, the total amount that enters their utility function is simply $C = m + p$, where $m$ and $p$ denote the monetary equivalent of the benefit received from each type of good provided by the president. For the president, both types of goods are taken from the same single pool of resources. Therefore, the assumptions on $\mu_j(\cdot)$ guarantee that there are economies of scale when using club goods but, if the president wants to benefit a specific legislator, it is better to use private goods because the economies of scale might be wasted with “free riders”.

**The President:** The president does not seek to maximize the number of votes in congress, but rather to minimize the costs of passing legislation provided he obtains the necessary level of support, which is represented by $Q$. For any given distribution of ideological aversion, the president can induce more legislators to vote with him by providing political favors either to parties, or directly to legislators.

In both the single-good and two-good version of model the president allocates some amount of the club good to each party, which is represented by $M_j$. In the two-good version, the president can also allocate the private goods to individual legislators. As the final decision of how much private goods will be handed out depends on a critical level of ideological aversion that varies between parties, the amount distributed to each party is represented by $P_j(X)$.\footnote{Actually, legislators in the same party $j$ and with the same $X$ could, in principle, receive different amounts}
These handouts are given in exchange for the votes of all legislators in the party with 
v(C) ≥ X. In this way, every legislator whose utility when voting with the president and receiving the transfers is at least as high as when voting against him without transfers, must take part in the deal and vote with the president. An increase in transfers causes some votes to switch to the president’s side. Exactly how the votes change depends on party and legislator specific parameters, and this will drive the president’s decision on how to best spend his resources.

2.1 The Decision Problem with One Good

The president does not seek to maximize the number of votes in congress, but rather to minimize the costs of passing legislation provided he obtains a necessary level of support Q. Before any club good is allocated, the cutpoint between those who vote with and against the president is the same in all parties (X = 0).\(^{11}\) However, once some M is allocated, the cutpoint in each party is allowed to differ to X\(j\) and the number of votes the president receives from each is given by \(N_j \Phi_j(X_j)\). The president must then choose an allocation of resources — which implies setting the optimal \(X_j\) for each party — that ensures that number of votes he receives meets the minimum support threshold Q.

To ensure the allocation of resources is the one that uses up the least amount of resources, the president decides which party to “invest” his resources by observing the rate of return of each party. This rate of return is defined by a series of exogenous factors such as size, ideological aversion, and dispersion, but also by the endogenous allocation of the club good itself. So, as in Cox & McCubbins (1986), even though the president will make transfers to the party which yields him the highest rate of returns, this president’s transfer itself affects the marginal rate of return from each party.

Proposition 1. If \(M_j^*\) denotes the optimal allocation of resources to party \(j\), and \(X_j^*\) the cutpoint between party \(j\) members that vote with and against the president given \(M_j^*\), then \(X_j^* = v(m_j^*)\), of P. However, because a continuum of legislators is assumed, the president’s optimal allocation will always give the same amount \(p_j(X)\) for all of them, as we show later.

\(^{11}\)If \(Q \leq \sum_{j=1}^{J} N_j \Phi_j(0)\), the problem becomes trivial. In this case, since legislators with \(X \leq 0\) are always better off voting with the president, he does not need to expend any resources in order to have the votes he needs.
where \( m_j^* = \mu_j(\hat{M}_j^*) \).

**Proof** — The proposition follows directly from the definitions presented above: It is known that if \( \hat{M}_j^* \) is the optimal allocation of \( M \) to party \( j \), \( m_j^* = \mu_j(\hat{M}_j^*) \) is the amount actually received by each legislator. Also, \( v(m_j^*) \) was defined as the utility each legislator in party \( j \) derives from consumption of \( m_j^* \). Without any transfers \( X_j = 0 \ \forall \ j \in J \), so it follows that after optimal transfers the cutpoint \( X_j^* = v(\mu_j(\hat{M}_j^*)) = v(m_j^*) \). ■

This proposition reveals that by choosing how much gets distributed to each party, the president is in fact setting cut-points between those who vote with him and not, within each party. The existence of these cutpoints is the key to building the solution to the problem because in order to understand how this decision is made it is best to consider the effects of marginal changes in the allocation of club goods. To this effect, we follow Dixit & Londggregan (1996) and use a graph (Figure 1) to clarify the argument.

Consider that the president’s initial strategy is such that the cutpoint for a party \( j \) is at \( X_j \), with the lightly shaded area designating legislators who vote with the president. An extra unit of \( M \) allocated to this party increases each and every legislator’s utility, prompting those “close” to \( X_j \) to shift sides and vote with the president. Therefore, the new cutpoint \( \tilde{X}_j \) lies to the right of the initial one. When the increase in \( M_j \) is very small, the magnitude of the shift — or the distance between the old and new cutpoints — is given by the extra consumption each legislator enjoys \( \mu_j'(M) \) multiplied by the marginal utility of consumption \( v'(C_j) \).

[Figure 1 about here.]

The number of legislators who switch is given by \( N_j \int_{X_j}^{\tilde{X}_j} \phi_j dX \), which is the dark shaded area in Figure 1. Since the shift is marginal, this area can be approximated as the product of the shift in the cutpoint \( v'(C_j)\mu_j'(M) \) and the density at the initial cutpoint \( N_j\phi_j(X_j) \). Note, however, that changes in \( M_j \) affect several terms in both of these expressions, so in order to make these effects more transparent it is useful — though a bit cumbersome — to write the
marginal effect of spending on the votes obtained from party \( j \) \((Q_j)\) as:

\[
\frac{dQ_j}{dM_j} = N_j \phi_j(v(\mu_j(M_j)))v'(\mu_j(M_j))\mu'_j(M_j) \tag{2}
\]

This expression makes use of the fact that \( C = \mu_j(M_j) \) and that \( X^*_j = v(m_j) \), and is essential to the solution of the president’s decision problem, as is made clear by Prop. 2.

**Proposition 2.** Let \( X^*_j \) be the cutpoint in party \( j \) resulting from the optimal allocation of resources. It follows that if the decision problem has an interior solution it is such that:

\[
\sum_{j=1}^{J} N_j \Phi_j \left( X^*_j \right) = Q \tag{3}
\]

\[
\frac{dQ_j}{dM_j} = \frac{dQ_k}{dM_k} \quad \forall j, k \in J \tag{4}
\]

*Proof* — From Proposition 1 it is known that \( X^*_j = v(m^*_j) \). For \( M^*_j \) to be optimal, the marginal return in votes to the dollar must be equal across all parties\(^{12}\) and the president must obtain a minimal threshold \( Q \) of votes. From the definitions and preceding discussion, it is known that Eq. 3 reflects the latter while Eq. 4 reflects the former. ■

The density of the party at the margin is what determines the rate of return to the president’s transfers, and for this reason the cutpoints in each party are not necessarily the same — and probably will not be. Therefore, the last legislator bought in each party will not exhibit the same ideological aversion towards the president.

Within each party, those legislators beyond the cutpoint do not vote with the president, but receive the transfers nonetheless, as any other member of the party. The existence of these “free-riders” of sorts is main driving force behind the differences between this version of the model, and the two good version, which we now turn to.

\(^{12}\)I express this optimality condition in terms of the marginal return in votes due to its intuitive appeal in this case. However, in the computations we actually use the marginal cost of votes, which is simply the inverse of Eq. 2.
2.2 The Decision Problem with Two Goods

As before, the president needs to choose an allocation of resources that meets the minimum support threshold. However, while in the one good model the president’s problem consisted of choosing one cutpoint within each party \( X_j^* \), in the current version there are two cutpoints to be chosen (\( \tilde{X}_j \) and \( X_j^* \)).

**Proposition 3.** The president’s optimal decision will be such that for each party \( j \) there will be a cutpoint \( X_j^* \) such that a legislator from that party with ideological aversion \( X \) will vote with the president if and only if \( X \leq X_j^* \). There will be also another cutpoint \( \tilde{X}_j \leq X_j^* \), such that only the legislators with \( \tilde{X}_j < X \leq X_j^* \) will receive transfers of private goods.

**Proof**— Suppose that when the president is deciding optimally, party \( j \) receives \( m_j^* \geq 0 \) and \( p_j = 0 \) for all its legislators (no member receives private transfers). Then, each legislator in the party receives \( m_j^* = \mu_j(M_j^*) \), and votes with the president if and only if \( X \leq v(m_j^*) \). Thus, \( X_j^* = \tilde{X}_j = v(m_j^*) \), and the president will receive \( N_j \Phi_j \left( v(m_j^*) \right) \) votes from the party.

Now, suppose that the president needs \( Q_j \) votes from party \( j \), with \( Q_j > N_j \Phi_j \left( v(m_j^*) \right) \), and that to obtain these additional votes he uses private transfers to certain members of party \( j \). Legislators in the party for whom \( X \leq \tilde{X}_j = v(m_j^*) \) are already voting with the president, so only those with \( X > v(m_j^*) \) will be targeted with private goods. Suppose that the president targets a legislator with aversion \( X' > \tilde{X}_j \). Define \( p_j^*(X') \) as the minimum payment he must make to win her vote. Then, \( p_j^*(\cdot) \) which must satisfy \( v \left( m_j + p_j^*(X') \right) = X' \), and consequently \( p_j^*(X') = v^{-1}(X') - m_j \). Since \( v(\cdot) \) is strictly increasing, so is \( v^{-1}(\cdot) \), and therefore \( p_j^*(\cdot) \) is strictly increasing. This means that the president will distribute private goods to the legislators with the lower \( X \)’s among those for whom \( X > v(m_j^*) \), as they require less such transfers to vote with the president than legislators with higher \( X \). Hence, the president will give private goods to legislators with \( X > \tilde{X}_j \) up to a cutpoint \( X_j^* \) that ensures that \( Q_j = N_j \Phi_j(X_j^*) \). Consequently, \( X_j^* \geq \tilde{X}_j \).
Proposition 4. Let $M_j^*$ be the optimal provision of club goods to party $j$, with $m_j^* = \mu_j(M_j^*)$, and $p_j^*(X)$ the optimal provision of private goods. Then,

- $\tilde{X}_j = v(m_j^*)$, and
- $v\left(m_j^* + p_j^*(X)\right) = X, \forall X \in [\tilde{X}_j, X_j^*]$.

Proof — These follow directly from the proof of Proposition 3.

This characterization of the optimal cutpoint allows to state the president’s decision problem as

$$\min_{\tilde{X}_j, X_j^*} \sum_{j=1}^J (M_j + P_j)$$

s.t

$$\sum_{j=1}^J N_j \Phi_j(X_j^*) \geq Q$$

$$\tilde{X}_j = v(\mu_j(M_j))$$

$$P_j = \int_{\tilde{X}_j}^{X_j^*} N_j \left[v^{-1}(X) - v^{-1}(\tilde{X}_j)\right] \phi_j(X)dX.$$  (8)

where the constraints represent the requirement that president obtain a minimum threshold of support (Eq.6), and what was shown to be true in Proposition 4 about the cutpoints $X_j^*$ and $\tilde{X}_j$. Note that Eq.8 is different from what is shown in Proposition 4 simply because the amount of private transfers made by the president to members of a given party ($P_j$) was re-written as a function of $\tilde{X}_j$.

The optimality conditions actually used to solve the problem are the first order conditions of this minimization problem. In this respect, the first constrain translates directly into the minimum support condition, which simply states that the president must ensure he receives at least $Q$ votes. While this condition is stated generically exactly as in Eq.3, note that in contrast with the single good model, $X_j^*$ now depends on the allocation of two different goods. Hence, Eq.6 can be restated as $\sum_{j=1}^J \left[N_j \int_{-\infty}^{\infty} 1\{v(m_j + p_j(X)) \geq X\} \phi_j(X)dX \right] \geq Q$, which makes this fact clear.
this two good version of the model requires an additional condition dealing the *marginal rate of substitution* between in private and club goods, thus referring to the optimal provision of favors *within each party*. As in the single good model, there is also a condition that deals with the optimal allocation of resources *across parties*, and reflects the notion that the *marginal cost* of support from each party should be the same.

**Proposition 5.** If the president’s decision problem has an interior solution, it is such that within parties, the optimality condition is

\[ N_j \left[ \Phi_j(X_j^*) - \Phi_j(\tilde{X}_j) \right] \mu_j(M_j^*) = 1; \]  

and across parties the optimality condition is

\[ v^{-1}(X_j^*) - v^{-1}(\tilde{X}_j) = v^{-1}(X_k^*) - v^{-1}(\tilde{X}_k) \quad j, k = 1, ..., J. \]  

**Proof** — Follows from the first order conditions of president’s problem (see Appendix). □

These conditions are, in fact, quite intuitive. The *within parties* condition deals with the balance between private and club goods that are provided to the members of a given party in exchange of votes. The idea is that given the number of votes the president will need from some party \( j \), \( X_j^* \) is defined, but that the president could provide different mixes of goods to obtain these votes. As \( \tilde{X}_j \) determines the total amount of club goods that is transferred to party \( j \) as well as the legislators that will also receive private goods, Eq.[9] shows that \( \tilde{X}_j \) will be such that the president is marginally indifferent between providing either type of good. The left hand side (LHS) of equation [9] represents the variation in \( P_j \) in response to a change in \( M_j \). For example, if the LHS of equation [9] is less than one, the president should decrease \( M_j \), because the cost in private goods to keep the same votes would be lower than the economy afforded by club goods.

The *across parties* condition, on the other hand, deals with the fact that president must compare the marginal cost of buying votes from different parties. From Proposition[4], it can be
\[ p_j^*(X) = \begin{cases} v^{-1}(X) - v^{-1}(\tilde{X}_j), & \text{if } X \in [\tilde{X}_j, X_j^*]; \\ 0, & \text{otherwise.} \end{cases} \]

Therefore, Equation 10 simply states that the marginal cost of a vote must be equal across parties. The marginal cost associated with party \( j \) is measured as how much of private goods the president needs to give to the marginal legislator of that party, thus \( p_j^*(X_j^*) = v^{-1}(X_j^*) - v^{-1}(\tilde{X}_j) \).

2.3 General Results

Together, Equations 6, 9, and 10 fully characterize the president’s allocation of resources that minimizes the cost of obtaining the minimum threshold of support, as long as such problem has an interior solution\(^{15}\). While the optimal distribution profile does not have a neat analytical form, the optimality conditions entail that the marginal legislator in each party will always be bought off using private goods. This is so because in Eq. 9 whenever \( M_j > 0 \), one cannot have \( \tilde{X}_j = X_j^* \), which implies \( P_j > 0 \).

As a consequence, even though not all parties receive club goods, for the ones that receive, there are always some members who receive some amount of private goods\(^{16}\). The intuition behind this result is that club goods also benefit members of the party who will not vote with the president, so to reduce this “waste”, the president is better off providing a more targeted good even if, in a sense, it is “more expensive”.

While at first this general result might seem as a mere technicality, it has important political implications:

1. Presidents bargain with individuals whenever possible, even if there are economies of

\(^{14}\) Although \( M_j \) changes when \( X_j^* \) increases, it can be shown that the within parties optimality condition guarantees that the marginal effect of the change in \( M_j \) is compensated by the change in \( P_j \).

\(^{15}\) Corner solutions require small tweaking of these conditions. While these situations have been appropriately dealt with in the simulations presented in the following section, a proper discussion was omitted due to space constraints.

\(^{16}\) In fact, the marginal legislator in each party receives the same amount of private transfers. Or in other words, if party \( j \) has legislators been bought, some of them must be receiving private goods.
scale in dealing with parties. This result is particularly striking in light of a widespread understanding that it is in the president’s best interest to negotiate with parties rather than with individual legislators. Accordingly, party bargaining yields more stable and predictable support and reduces transaction costs (Figueiredo & Limongi 2002, p.334), which should prompt presidents to avoid buying votes in the “retail” market and buy them “wholesale” from parties whenever possible (Mejía Acosta 2004). Our model questions this understanding.

2. It is cheaper for the president to buy support when he can bargain with parties and with legislators. This implication would come as a shock at least to Brazilian journalists, pundits, businessmen, and even politicians that frequently claim that the widespread practice of “giving-to-receive”\textsuperscript{17} is a “waste” of national resources, and who call for measures aimed at strengthening parties and marginalizing the individually motivated, rent-seeking legislator.

3. When the president bargains with individual legislators, fewer resources are distributed overall because such mode of bargaining is cheaper. Since part of what gets distributed in this context is not done through party structures, it implies that parties, as such, manage considerably less resources. While the internal dynamic of parties is not modeled in this paper, the sheer fact that a smaller amount of resources is channeled through them suggests that parties are weakened (or weaker) in such environments. Parties not only receive less in absolute terms but as some legislators receive transfers directly, without going through parties, their clout is diminished further. The president is definitely better off and the parties, as organizations, are the big losers.

All of these implications follow from the fact that the marginal legislator is bought with private goods, but can also be seen by solving the model numerically through simulations. In fact, there are many other comparative static analysis that can be carried out numerically by

\textsuperscript{17}The expression \textit{é dando que se recebe}, a quote from St. Francis, was allegedly first used in this context by Deputy Roberto Cardoso Alves during the 1988 constitutional assembly, and quickly became one of the most infamous political phrases in the country.
simulating different decision environments. We show some of these in the Web Appendix to this paper.

Before moving on to show that real world presidents act roughly as the model would predict, we would first like to make the case that the two versions of the model are not simply abstract theoretical constructs, but have direct analogues in the real world that, moreover, are at least compatible with some of the noteworthy implications of the model.

3 Not Just an Abstraction

Brazil and Uruguay provide an interesting contrast with respect to how executive-legislative relations work in multiparty presidential settings. While in both countries the use of cabinet positions and other high level jobs as a means of cementing and maintaining government coalitions with parties has been well documented (Altman 2000, Amorim Neto 2006, to cite just two), the two countries differ markedly in the governments’ ability and incentives to exchange resources for support with individual legislators.

In Uruguay, as in other Latin American presidential systems, the president controls most state resources\(^\text{18}\) and typically lacks a majority. He is thus forced to negotiate alliances with other factions in his own party as well as factions in other parties\(^\text{19}\). As in Brazil, the political resources controlled by the president are used as a means to obtain and maintain legislative support from parties. What is different is that there are no instruments for the executive and individual legislators to exchange resources for support.

In a very comprehensive analysis of Uruguayan politics in the 1980’s and 1990’s, Buquet, Chasquetti & Moraes (1998) identify a packet of more than 300 jobs around which coalitions

\(^{18}\)As in Brazil, Uruguayan presidents exercise much control over the executive branch. It should be noted, however, that the main state companies are autonomous entities, for which the president can appoint, but not discharge, directors. Additionally, there is a constitutional mandate that grants the opposition representation on the boards these entities. Finally, an important distinction between the two countries is that ministers are, at least in principle, subject to censure by Parliament. Though all this limits presidential discretion, the constitution also prescribes to the president the power to dissolve congress under very special circumstances.

\(^{19}\)Since return to democracy in 1985, Uruguayan electoral politics has been dominated by three large parties, but the basic unit of political organization is the party faction. Buquet, Chasquetti & Moraes (1998) have estimated the Effective Number of Parliamentary Factions to be between 4 and 8 during this period, and until the election of Tabaré Vásquez in 2005, the president’s party, and much less his faction, never had a majority.
are built. These are the most visible prizes sought by politicians, and were almost uniformly listed by several former occupants of high profile interviewed in Montevideo in 2005. Besides the capacity to appoint other party members to key posts, to deliver visible goods to the electorate, and to take credit for policies and projects, some of these positions are particularly valuable because they allow hiring of hundreds of low level temporary employees and/or they manage projects funded by multilateral institutions that carry considerable hiring discretion. Ministries are so important for potential allies that even in a country with a very stable administrative structure such as Uruguay, in the rare instance in which an extra ministry was created, it was done mostly to accommodate political interests.

All accounts indicate that the distribution of these jobs is done behind closed doors, between the president and a handful of faction leaders. In this, the process is no different from what happens in Brazil, or even Bolivia, for that matter: it is done with leaders, who bargain as leaders of their political groups, and never as individual legislators. There are, however, two important caveats pertaining to how this process works in Uruguay.

First, such exchanges with party leaders are usually enough to assure support, at least in the medium term, from the whole faction. Discipline is very high in the Uruguayan congress (Buquet, Chasquetti & Moraes 1998); factions can demand the replacement of their appointee; and when parties break with the government, all their members leave the cabinet. In Brazil, in contrast, party discipline is weaker. Ministers often remain in office even after their parties formally break with the government, thus effectively splitting the party between pro and anti-government factions. Ministers sometimes even change parties to retain their posts. During Lula’s first term, for instance, Helio Costa provides an example of the former, and Ciro Gomes and Miro Teixeira of the latter.

The second difference is that in Uruguay, according to almost all interviewees, high level appointments are the sole instrument the president has, besides compromising on policy initiatives, to put together its voting coalition in Congress. In Brazil, the situation is very different. Pereira

---

In 1995, President Batlle created the Ministry of Youth and Sports to assign an extra seat to former President Lacalle’s faction in the National Party.
June 16, 2009

(2002) describes how the Cardoso government set up an office especially to follow how legislators voted, and how many projects of benefit to them were being implemented by the government. The sheer existence of a single screen on which it was possible to cross-tabulate individual amendment implementation data with each legislator’s voting records was denied by the government, and even if such a system existed some would question its relevance in determining how parliament behaves (Figueiredo & Limongi 2002). Still, there is quite a lot of evidence that individual level exchanges are common in Brazil. There are strong empirical regularities between important votes and implementation of individual amendments (Pereira & Muller 2004, Alston & Mueller 2006), such exchanges are commonly mentioned in the news (Souza 2005), legislators openly complain when the government does not authorize expenditures they expect (Krakovics 2004, for a typical example), and recent studies have found that success in getting their budget amendments appropriated is associated with a more pro-government stance, after controlling for the ideological distance between legislators and the president (Zucco Jr. 2009).

In Uruguay, exchanges at the individual legislator level do not regularly happen. Granted, a few interviewees pointed to the same notorious politician from a small province of the country who has quite a reputation as an avid bargainer. While these exchanges were not entirely on personal grounds, since he was, in fact, leader of a party faction, the fact that several interviewees pointed to this very same case over and over also suggests it is quite exceptional, and was looked down upon by the rest of the political establishment. This is a quite different attitude than the one prevalent in Brazil, where pork and patronage-seeking behavior is generally regarded as a fact of life. As a general trend, exchanges based on private goods that can be linked to a particular legislator or region are very rare in Uruguay. In fact, any bargaining between the executive and individual legislators is very rare.

Reasons for this difference can be traced back to specific institutional arrangements. For instance, the Brazilian example shows that much of the provision of individual benefits to legislators is done through the political use of the budget. In this, Brazil and Uruguay are

21 These projects are added to the budget as amendments. In Brazil, the president controls whether these projects are really funded or not, even though they have been approved by Congress.
very different. In Uruguay each budget spans five years, and is passed during the first year of each presidency. There are yearly rendición de cuentas bills, where expenditures can be added, removed, or rearranged, and which sometimes function as de facto yearly budgets. Both the five year budget bill and these yearly revision bills are great opportunities for congress to attempt to extract more resources from the government.\footnote{Moraes, Chasquetti & Bergara (2005) have shown that the congress in Uruguay greatly affects the final composition of the budget, while Morgenstern (2004) wrote that legislators commonly combined requests for certain expenditures with threats to make cuts in parts of the budget that are dear to the executive (p.178).} Through logrolling within Congress, legislators do manage to include matters that interest them, but in Uruguay there is no such thing as an individual amendment to the budget, and most legislators could not claim direct credit for particular budget items even if they could prove they had been responsible for their inclusion. With half of the lower house elected from a single electoral district where 40% of the population resides, and with all Senators elected in the country at large in a closed list proportional electoral system, the great majority of the legislators are not accountable to any specific geographic location. Hence, it is not typically expected that the legislator will lobby the executive or seek to include narrow local measures in the budget. Legislators, in Brazil, are also elected in large districts, but the open list system guarantees that they know where their votes came from, and many have relatively concentrated constituencies.

Obviously, this quick comparison does not imply causality of any kind. If not for any other reason, one can easily claim that the lack of individual bargaining with legislators in Uruguay is caused by, and not a cause of, strong parties which, in turn, owe their existence to specific institutional arrangements. Similarly, parties in Brazil have always been weak, and it is impossible to ignore the role the country’s extremely permissive electoral system plays in this reality. Our model is static, so it does not account for the emergence of either system. Much to the contrary, it simply states that if individual level bargaining exists, presidents will pursue it, thus diverting resources away from parties. Hence, the two points to be made with this rather cursory analysis are quite simple: Empirical correspondents to both variants of the models exist; and evidence from two of these cases is at least compatible with implications derived from the formal model.
Uruguay is an example of a country in which there are no instruments to allow the president and individual legislators to bargain, and it is also a country where parties/factions have retained their role as main agents in the political process. Conversely, Brazil is a case of much feebler parties, and one where there is plenty of individual level bargaining. This simple evidence is compatible with several implications of the models discussed in this paper, namely that when presidents have the opportunity to bargain with legislators, they will do so, because it is cost effective; and that the absence of individual legislative bargaining should be associated with strong parties, and vice-versa. Our model shows that stronger and more homogeneous parties diminish the advantages of using individual negotiation. In this sense, one could conjecture whether factions are a way to reduce the heterogeneity of the groups involved in the bargain, reducing the systemic disadvantages (less cost-effectiveness) of not having the instruments for individual negotiation.

4 Simulating a Real World Legislature

The preceding cursory discussion was meant simply to show that the model is not as abstract as it might seem at first. However, our model can be subject to much more stringent tests, and judged by the specific predictions it can make in concrete cases. While lacking a neat analytical solution, an important upside to the model is that it is flexible enough to simulate actual party systems, and consequently the environment in which presidents operate. In this section, we apply our model to ten years of executive-legislative relations in Brazil.23

To carry out this exercise, it is first necessary to make a few numeric assumptions, which consist of defining specific functional forms for expressions that were generically stated in the Section 2. In the simulations that follow, we assume $\phi_j \sim \text{logistic} (\alpha_j, \beta_j)$, where $\alpha$ is the location parameter (analogous to the mean) and $\beta$ is a scale parameter defined as $Var(X) = \frac{\pi^2 \beta^2}{3}$. We define the utility function as $U(C) = C^\alpha$ (with $\alpha = \frac{\alpha}{2}$), and the club good technology

23All data used in the section are from Brazil, and were observed yearly. While inputs could be obtained since at least 1989, one of the outputs, namely resources distributed to individual legislators, is only available after 1995. Therefore, the period studied is confined to the years from 1996 to 2006.
function as $\mu(M_j, N_j) = \frac{kM_j}{N_j}$. Then, it is only a matter of providing the set of inputs that characterize a party system, compute the predictions (or outputs) and compare these with actual data.

Before showing and discussing the model’s predictions, however, we briefly describe the empirical correspondents of the model’s inputs and outputs, and provide an alternative model to serve as a baseline against which to judge the predictions.

4.1 Inputs

Parties are defined as distributions of ideological aversion, which for this exercise we have specified as logistic distributions. To define the actual shape and location of each party we took existing estimates of the ideology of individual legislators (Power & Zucco Jr. 2009) and estimated the best logistic distribution to fit these estimates. Even though, in principle, all parties in the legislature could have been included, restriction on the availability of ideology estimates led us to restrict the set of parties analyzed to the eleven largest. Together, these parties controlled between 95% and 98% of seats in the Brazilian lower house in every year of the period studied. The size of each party was operationalized as the number of members in each party at the time of the first roll call of the legislative year.

Besides these parameters of interest that represent a stylized party system, the model takes two additional parameters required by our numerical assumptions, namely $\alpha$ and $k$. Parameter $\alpha$ is the exponent on the utility function of legislators, and to ensure that utility increases at a decreasing rate with political favors received it must lie in the interval $\alpha \in [0,1]$. Parameter $k$ is the degree to which there are returns to scale from dealing with parties rather than with individuals. In order to assure that it is more economical to deal with parties than with individual legislators, it must meet the condition $k > 1$. For our present purposes, as long as $k$ and $\alpha$ meet their respective conditions, their precise value is not of direct interest to the analysis, and in this sense, they are just nuisance parameters. The results reported below are for the $k$ that

---

24 The roll call data is the same used in Zucco Jr. (2009), compiled by that author from Limongi & Figueiredo’s roll call and data from the Câmara de Deputados website.
yields the best “joint fit” to the data on the criteria of interest (e.g. cabinet membership, pork allocation, and votes with president) with $\alpha$ fixed at $2/3$. This “calibration” was done in a rather informal manner, as it we could not devise a procedure to allow for the actual estimation of $\alpha$ and $k$.

4.2 Outputs

There are three outputs of interest, namely how much resources should be distributed to parties (cabinet posts), how much should be distributed to individual legislators in each party (pork allocation), and how many votes, in average, each party should contribute to the president (voting behavior).

With respect to the first of these quantities, the model’s club goods output to each party is a continuous value $M \geq 0$. The real world correspondent to club goods are high level positions in the administration which, as discussed in preceding chapters, are typically handed out to parties. Though the relevant positions frequently extend beyond just ministries, the composition of the cabinet can be systematically analyzed and is a good proxy for the overall distribution of club goods. Cabinet membership was coded as of March of each year since January and February are usually “dead” months in Brazilian politics. Data was originally compiled by Octavio Amorim-Neto, and updated by the authors.

Similarly, the model also makes predictions about the distribution of private goods to the members of different parties, which is also a continuous value $P > 0$. As the empirical correspondent of these private goods, we use deputies’ individual amendments to the budget. More specifically, we computed the share of the total amount actually expended on individual amendments, that could be identified as having been proposed by a member of a given party.

25The value of $\alpha$ was set after some experimentation using values between 1/3 and 3/4. Results were only marginally different.

26In some cases the relevant collective of legislators is not strictly a party. In Uruguay it is a party faction, and in Brazil and Bolivia it is frequently a party from a certain region of the country. The main point is that these goods are typically handed collectively to a group of legislators.

27Some agencies and/or companies can be especially interesting to politicians, such as utilities, banks, transportation authority, development agencies, among others.

28Budgetary data were obtained from databases provided by the Brazilian’s Lower House Consultoria de Orçamento e Fiscalização Financeira.
This value was then compared to the share of private goods \( P \) received by the members of each party under the model’s optimal distribution profile.

In the real world, these amendments are not all that individual legislators obtain from the government. Though other mechanisms besides presentation and implementation of individual amendments to the budget exist, we cannot account for them with the data at hand. Individual legislators frequently influence appointments to lower level positions in the bureaucracy, especially in agencies with offices in their home states, and sometimes extract concessions. However, as for parties with cabinet posts, budget amendments are an important part of what individual legislators fight for, and can be systematically analyzed.

Finally, the model also predicts how many legislators in each party will vote with the president. As its empirical correspondent we use the average over all roll calls taken in the year of the number of legislators in each party voting with the president.

The results for cabinet membership are reported as the share of parties correctly predicted to be in and out of the cabinet. For the other two outputs analyzed, we report the \( R^2 \) of a regression of the data on the prediction. Thus, in all cases there exists an indicator of fit that is measured from a minimum of zero to a maximum of one.

### 4.3 The yardstick

The quantities of interest the model predicts are readily interpretable, but it is not obvious how to judge the quality of these predictions. In fact, yardsticks against which to measure any prediction are almost always objects of debate. In the present case the problem is compounded by the fact that we analyze three different predictions, and to the best of our knowledge, no other theory yields these predictions simultaneously.

Aware of this difficulty, we established an alternative model whose predictions can be compared to our own. This baseline model posits that minimal connected winning coalitions will form (Axelrod 1970) and that parties included in the cabinet vote with the president and

---

\[ ^{29} \text{Given that some of the quantities involved in arriving at the predictions have no natural metric, this regression setup helps account for differences in scales.} \]

\[ ^{30} \text{We add parties to the government, by proximity to the president, until the coalition reaches a pre-set thresh-} \]
have access to pork. This simple baseline model uses information on size and mean ideological position of parties, which is analogous to the inputs taken by our model, and very much superior to simply generating random baseline predictions. While it might be naive to expect that all members of the coalition will back the president and all members of the opposition will oppose him, this is not much different from treating parties as unitary actors, as other models do (Pereira & Muller 2004). Moreover, full compliance of the coalition members is a natural reference point that has been used by other authors (Pereira, Power & Raile 2006).

The fit of the baseline predictions could be improved with the addition of other covariates, and regressions that predict each of the quantities of interest well can easily be specified. However, that would not provide a fair appraisal of our model’s predictions. The point of our model is not simply to make perfect predictions, but rather to take a bold step toward a more theoretically based approach to the theme. While the results it yields are far from perfect, and while some technical aspects of the model’s resolution are quite complicated, it is built from a rather simple substantive assumption (cost minimization), the intuition behind its optimality conditions is very straightforward, and it yields several different testable and internally coherent predictions. Therefore, these predictions should be tested against an alternative model that rests on similarly simple assumptions.

More specifically, with respect to cabinet membership parties are predicted to be either in or out of the cabinet, so we simply count the number of wrong predictions as a measure of the accuracy of the model’s predictions. For pork and votes with the president, the baseline model predictions are obtained by regressing the data on a dummy that indicates whether or not a party was in the cabinet. The fit of this baseline model, which is later compared to the fit of our model’s predictions, is measured by the R$^2$ of this regression.

old. While the concept itself generally refers to a 50% threshold, for symmetry we use the same value $Q$ as used in the model.
4.4 Results

Yearly observations of the input variables were fed into the optimization routine that searched for the best allocation of both types of resources. Table 1 summarizes the “quality” of the model’s predictions for the three outputs of interest, and compares them with the baseline predictions. For cabinet membership, the table shows the share of correct predictions. For pork allocation and votes with the president, figures reflect the $R^2$ of a regression of the data on the predictions. In all cases, higher values indicate a better fit.

In general, the table shows that the model’s predictions are always better or at least as good as the baseline predictions, for all outputs in all years, with the exception of votes with the president in 2000–2002. On average, the model greatly improves on the baseline predictions in all three outputs for the whole period studied.

Except for the cabinet membership predictions for 1999, predictions for the Cardoso period (prior to 2003) are quite good. Figure 2 shows results for 1998, a typical year in this period. Deviations from perfect predictions are very small, too small, in fact, to make any meaningful analysis of what the model failed to capture. Given that the model’s optimality predictions deviate more from what is actually observed during the Lula presidency (2003 onwards), this second period is, in a sense, more interesting to analyze. Hence, in Figure 3 we report results for all years from 2003 through 2006.

While the predictions for the Lula period were clearly inferior to those for the preceding president, a first look at the center column in Figure 3 shows that the PMDB alone accounts for most of the noise in the results. Closer examination shows that as a systematic pattern, the PMDB and the PTB received considerably less than the optimal share of pork predicted.

---

31The algorithm used is a straightforward implementation of the optimality conditions in R. To get around numeric problems we ran the optimization procedure hundreds of times for each year using randomly generated start values.
by the model in all four years. In contrast, despite all the talk about the PT’s (the president’s party) unwillingness to share the spoils with coalition partners, even though the PT received more than its optimal share in most years, the PP and the PL were the most overpaid parties in terms of pork.

Results for votes with the president add to the overall picture. Just as the PTB received less than the model’s optimal prediction regarding pork, it also voted less frequently with the president than would have been expected. The opposite holds for the PP and the PL, which received more pork than predicted, but which also lent more support than predicted. This particular result makes even more sense if one considers that the PP and PL, right-wing parties, were predicted to be out of the left wing president’s cabinet, but were actually included (the PP in 2006, and the PL in all years). One can say that in the case of these parties, Lula’s deviation from the optimal prediction was quite systematic. He allocated more resources and received more support from selected parties.

For the PT and the PMDB, the situation is a bit more intriguing. The president’s own party (PT) received more pork than predicted and delivered fewer votes. This is consistent with complains by coalition partners that government was not “sharing” enough resources with coalition partners. It also highlights the party’s failures to enforce its historically high levels of discipline once it finally came into power. As for the PMDB, while the optimal prediction suggests it should have received more pork, this shortfall did not cause the party to vote with the president less frequently than predicted by the model. The story here may have to do with the fact that the PMDB was divided into two factions throughout Lula’s first term, with one of them backing the government and participating in the cabinet, and another having remaining in opposition.

Regardless of the merits of this explanation, it is interesting to note that after his tumultuous first term, Lula made it a top priority to have the whole PMDB on board for his second term. This means that this source of error in the predictions will probably not be repeated in the
coming years, and the fit of the model’s predictions will probably improve.

Another curiosity has to do with the PP, PL, and PTB, which were roughly equal sized parties, and shared an opportunistic character and center-right inclinations. By showing that the PTB was not getting its “fair” share of spoils during Lula’s first term, our model corroborates one of the interpretations for why Roberto Jefferson, then the party’s leader, blew the whistle on the *mensalão* scheme even though his party was one its alleged beneficiaries.

It is interesting to note that *both* the model and the baseline predictions perform better during the period when Cardoso was president than in Lula’s presidency. This is especially true for predictions regarding pork, but can be noted as well in the other outputs. This difference suggests a shift in executive-legislative relations under the current president. Unfortunately, the intriguing question as to whether this shift is permanent cannot be answered with the data at hand, and it could simply reflect the temporary disarray caused by a new president, with little experience as an administrator, still learning on the job. Recall that Cardoso had been at the heart of the executive for two years prior to taking office, and many of his allies had already been in government together during that period. Lula, in contrast, took office with no executive experience, and having to hold together a coalition composed of strange bedfellows. From this perspective, it is not surprising that Lula did not behave optimally in his first term.

Our results show that presidential strategy was muddled at least in 2004 and 2005. While we have devoted quite a bit of effort to describing how results for these years deviate from what was expected, we have said nothing so far about the consequences of this deviation. It is very interesting to note that, in fact, the consequences of Lula’s strategy in these years — or lack thereof — were clearly felt. Figure shows that while for 2003 and 2006 the average number of legislators voting with the president is very close to the average level of support for the whole 1996–2006 period, in 2004 and especially 2005, the president enjoyed considerably less support. Yearly levels of support correlate with a measure of joint fit of the model (Corr. coefficient of 0.63, with a p.value of 0.04), and this correlation is even stronger if one considers just the fit of

---

32 The *mensalão* was a scheme in place between 2003 and 2005, through which the executive is alleged to have used outright bribes to buy votes in the legislature.

33 Joint fit is simply the average of the fit in each of the three outputs of interest shown in Table.
the prediction of pork (Corr. coefficient of 0.83, with a p-value <0.01).

These results indicate that Lula’s behavior, at least in 2004 and 2005, was suboptimal and are compatible with the idea that presidents faces incentives to behave as the model predicts. If the president could subvert the structure of executive-legislative relations and get away with it while maintaining the same levels of support as before, it would indicate that other strategies were available, and that executive-legislative relations could be drifting into a different equilibrium. However, as Lula paid the price in lowered support for deviating from optimality, it is probably the case that these deviations will be corrected soon.

[Figure 4 about here.]

5 Conclusion

This paper proposed a generic framework in which the distribution of political favors (pork and cabinet positions) by presidents to a multiparty legislature in exchange for support is treated, from the president’s perspective, as a problem of cost-minimization. It also stated, analyzed, and solved the specific decision problem such a president faces, presented the model’s main generic results, and analyzed its fit to real world data. The model is a step in the direction of unifying two parallel variants of the literature on coalition formation in presidential systems — one that stresses bargaining with parties and the other that emphasizes individual legislator behavior. In it, parties play an important role, even though bargaining with legislators also occurs. However, the parties’s role is less of that of a programmatic vehicle (Lyne 2008) than a channel to help distribute resources to legislators.\footnote{Frances Hagopian & Moraes (2009) have recently argued that parties can begin as patronage dispensing institutions and acquire programmatic consistency at a later point.}

The most important result is that it is in the president’s interest to bargain with parties and with individual legislators if both instruments are available. As a corollary, parties get fewer resources when individual-level bargaining exists. With fewer resources, party organization suffers, which implies that the existence of individual level bargaining weakens parties.
The external validity of the model was assessed by empirically evaluating its predictions about cabinet membership, pork allocation, and voting behavior of parties in the legislature. The results suggest the model’s predictions passed a minimal threshold of acceptability, and that our theory is consistent with the data in a non-trivial way. The application of the model to different time periods and to different countries well shed further light on the limits of its scope.

The empirical results suggest that Brazilian presidents do behave as if they were cost minimizers. This tendency was more pronounced for the Cardoso government, but cannot be completely discarded for the Lula years. There is also important evidence that presidents’ actual levels of support in the legislature increase when their behavior is closer to what is predicted by the model. That presidents lose from deviating from the model’s predictions is consistent with the idea that these predictions indicate “optimal” behavior.

If the story told here is true, there are some important implications for ordinary real-world politics. The “horse-trading” that accompanies coalition formation in multiparty presidential systems is frequently described in the media and regarded by pundits as a “waste” of resources caused by self-interested politicians. The remedy commonly prescribed is the strengthening and the reduction in the number of parties and the marginalization of the “individually motivated” politician. Our model suggests, however, that the individually motivated politician might actually be more compatible with effective government than strong parties, as long as one equates “effective” with “cost-saving.” This provocation, however, only refers to the exchange mechanism itself, and does not consider the fact that a system such as the Brazilian one invites corruption, as well as other negative externalities that accompany a more venal approach to politics.

This model also might help understand why so many “modernizing” presidents in Latin America have resorted to “traditional” coalition building techniques (e.g. vote-buying of the sort described here) in the recent past. After all, if individual level bargaining helps lower costs to the president, it becomes an specially attractive option in times where fiscal austerity is the
most immediate goal, which might help explain the resilience of this practice on the face of strong criticism from several sectors of society.

The mere existence of individual level bargaining diverts resources away from parties, and contributes directly to their further weakening. The intuitive implication, though relying on an extrapolation of the static model presented here, is that there is very little middle ground possible between a system with strong parties and a highly individualized political system with weak parties. Once the opportunity for individual level bargaining exists, it will tend to erode party structures but presidents have no incentive to introduce institutional changes that would limit it.

These issues are inherently connected to important normative questions. How to balance effective government with adequate representation? Should we care about having strong parties? Answering these questions is beyond the scope of this paper, but no system is set in stone, and as this paper has argued, the behavior of legislators and presidents is consistent with the incentives they face.

Appendices

A Proof of Proposition 5

A.1 Within Parties

Fix $X_j^*$, such that the total number of votes the president obtains in party $j$ ($Q_j$) is also fixed. The relative allocation of private and club goods within party $j$ will be the one that minimizes total payments made to the party. If $N_j \Phi_j(0) < Q_j \leq N_j$, define $X_j^*$ such that $N_j \Phi_j(X_j^*) = Q_j^{35}$ and express private goods as a function of club goods. The problem in Eq. 5

---

For $Q_j = N_j$, define $X_j^* = \infty$ if the distribution $\phi_j$ has infinity support.
then becomes:

\[
\text{Total Payments} = M_j + N_j \int_{v(\mu_j(M_j))}^{X_j^*} \left[ v^{-1}(X) - \mu_j(M_j) \right] \phi(X) dX.
\] (11)

The first order condition yields

\[
1 + N_j \left\{ -v'(m_j)\mu'_j(M_j) \left[ v^{-1}(\tilde{X}_j) - \mu_j(M_j) \right] \phi(\tilde{X}_j) - \int_{v(\mu_j(M_j))}^{X_j^*} \mu'_j(M_j) \phi(X) dX \right\} = 0,
\]

which can be re-written as

\[
N_j \left\{ v'(m_j) \left[ v^{-1}(\tilde{X}_j) - \mu_j(M_j) \right] \phi(\tilde{X}_j) + \left[ \Phi_j(X_j^*) - \Phi_j(\tilde{X}_j) \right] \right\} \mu'_j(M_j) = 1,
\]

and which after substituting \( v(\mu_j(M_j)) = \tilde{X}_j \), and canceling terms, reduces to

\[
N_j \left[ \Phi_j(X_j^*) - \Phi_j(\tilde{X}_j) \right] \mu'_j(M_j) = 1.
\] (12)

The second order condition is given by

\[
N_j v'(\mu_j(M_j)) [\mu'_j(M_j)]^2 \phi_j(\tilde{X}_j) - N_j \mu''_j(M_j) \left[ \Phi_j(X_j^*) - \Phi_j(\tilde{X}_j) \right] \geq 0,
\]

whose first term is always positive, while the second will be whenever \( \mu''_j(M_j) \leq 0 \). The case where \( Q_j \leq N_j \Phi_j(0) \) is trivial. Since the legislators with \( X \leq 0 \) are willing to vote with the president without receiving any political favors, \( M_j = P_j = 0 \). Finally, it is not possible to have \( Q_j > N_j \).

A.2 Across Parties

For simplicity, it is best to use only two parties in the analysis of the across parties condition, but the results can be extended for the general case with \( J \geq 2 \). Define \( TC_j(Q_j) \) as the minimum cost to “buy” \( Q_j \) votes from party \( j \). From the quorum constraint \( Q_2 = Q - Q_1 \), so the
The president’s problem can be stated as

$$\min_{Q_1 \in [0,N_1]} \{ TC_1(Q_1) + TC_2(Q - Q_1) \}. \quad (13)$$

Now, note that

$$\frac{dTC_j}{dQ_j} = \frac{dTC_j}{dX_j^*} \times \frac{dX_j^*}{dQ_j}$$

Applying the Envelope Theorem on Eq. 11, and using $N_j \Phi_j(X_j^*) = Q_j$, yields:

$$\frac{dTC_j}{dQ_j} = N_j \phi_j(X_j^*) \left[ v^{-1}(X_j^*) - \mu_j(M_j) \right] \left( \frac{1}{N_j \phi_j(X_j^*)} \right)$$

$$= [v^{-1}(X_j^*) - \mu_j(M_j)] = p_j^*(X_j^*).$$

Thus, the first order condition for Eq. (13) is

$$[v^{-1}(X_1^*) - \mu_1(M_1)] - [v^{-1}(X_2^*) - \mu_2(M_2)] = 0,$$

or just

$$p_1^*(X_1^*) = p_2^*(X_2^*),$$

and the second order condition is

$$\frac{dp_1^*(X_1^*)}{dQ_1} + \frac{dp_2^*(X_2^*)}{dQ_2} \geq 0.$$
References


Figure 1: Marginal Return of Spending

Notes: Figure shows the hypothetical distribution of $X$ in a given party, from minimum to maximum levels of aversion towards the president. As president increases transfers to the party, the share of legislators voting with the president increases at a rate that is determined by the density of the party at the margin.
Figure 2: Typical Predictions and Data for the Cardoso Presidency (1998)
(a) Predictions and Data for 2003

(b) Predictions and Data for 2004

(c) Predictions and Data for 2005

(d) Predictions and Data for 2006

Figure 3: Predictions and Data for First Lula Presidency (2003-2006)
Figure 4: Average Number of Legislators Voting with the President
Table 1: Summary of the Fit of Results: Model vs. Baseline Predictions

<table>
<thead>
<tr>
<th>Year</th>
<th>Cabinet Membership</th>
<th>Pork Allocation</th>
<th>Votes With President</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model</td>
<td>Baseline</td>
<td>Model</td>
</tr>
<tr>
<td>1996</td>
<td>0.82</td>
<td>0.64</td>
<td>0.91</td>
</tr>
<tr>
<td>1997</td>
<td>0.91</td>
<td>0.64</td>
<td>0.97</td>
</tr>
<tr>
<td>1998</td>
<td>0.91</td>
<td>0.55</td>
<td>0.90</td>
</tr>
<tr>
<td>1999</td>
<td>0.55</td>
<td>0.55</td>
<td>0.92</td>
</tr>
<tr>
<td>2000</td>
<td>0.73</td>
<td>0.55</td>
<td>0.95</td>
</tr>
<tr>
<td>2001</td>
<td>0.73</td>
<td>0.55</td>
<td>0.95</td>
</tr>
<tr>
<td>2002</td>
<td>0.64</td>
<td>0.55</td>
<td>0.80</td>
</tr>
<tr>
<td>2003</td>
<td>0.91</td>
<td>0.73</td>
<td>0.78</td>
</tr>
<tr>
<td>2004</td>
<td>0.82</td>
<td>0.55</td>
<td>0.49</td>
</tr>
<tr>
<td>2005</td>
<td>0.82</td>
<td>0.55</td>
<td>0.24</td>
</tr>
<tr>
<td>2006</td>
<td>0.64</td>
<td>0.36</td>
<td>0.52</td>
</tr>
<tr>
<td>Average</td>
<td>0.77</td>
<td>0.56</td>
<td>0.77</td>
</tr>
</tbody>
</table>

Notes: Figures range from 0 to 1, with higher values indicating better predictions. For cabinet membership, figures are the share of correct predictions, with eleven parties included in each yearly simulation. For pork allocation and votes with the president, figures reflect the R² of a regression of the data on the predictions.