

Method to the Madness? Spoils Distribution in Multiparty Presidential Systems*

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1 Introduction

Presidents in Latin America, especially those who preside over multiparty systems, are frequently confronted with the arduous task of post-electoral coalition building. An important part of this task consists on deciding how best allocate various kinds of resources, such as cabinet appointments, pork and jobs, to distribute to those who support the government in Congress.

In fact, anecdotal evidence suggests that in much of Latin America, day to day politics is more often than not a matter of responding to the “non policy” demands of relevant political players than one of fine tuning policy proposals. Often the president’s coalition partners demand no policy concessions even when the presidents’ policies differ radically from their expressed ideology, apparently because they value spoils more than policy concessions. The opposite situation is also common, with parties that should be aligned with the president’s policy attempting to extract a high toll in exchange legislative support.

*This is not really a paper, but a synthesis of three working papers, which are at different stages of development, and which do not entirely fit together. It includes material *co-authored* with Paulo Melo, a Ph.D. Candidate in the UCLA Economics Department. Please do not cite without checking with the author(s) for a current version. Comments and encouragement are greatly appreciated.

In this paper I propose a cost minimization approach to the issue.¹ Presidents control *different* types of resources, but in multiparty settings at least part of these have to be spent to obtain support in the legislature. I present a formal model of the president's resource allocation decision problem that captures this dynamic. This model generates testable predictions about "who" gets "how much" of "what". My claim is that presidents seek to obtain the necessary support to govern (pass legislation) using up the least possible amount of their political resources.

I proceed as follows. In the next section, I show how my work fits within the literature on executive-legislative relations in Latin America, and more specifically in Brazil. In section 3, I present a quick and informal overview of the model, where I take the time to draw an important parallel between my paper and literature on electorally driven public spending in the region. I also develop the concept of "affinity," which provides the background against which the president will make his resource allocation decisions. Section 4 formalizes the decision problem, presents a general solution, and a brief discussion of some of its predictions. In Section 5, I use data from Brazil as preliminary evidence of the plausibility of my model predictions. Section 6 informally discusses a possible extension of the model, and Section 7 concludes.

2 Literature

Most of the comparative work on Latin America has focused on the capacity of the president to shape policy through the use of constitutional and partisan powers (Shugart & Carey 1992, Mainwaring & Shugart 1997), with special attention to prerogatives such as exclusive introduction of legislation, veto and decree power, on one hand, and to legislative fragmentation and indiscipline, on the other. Within this framework, local scholars have also contributed considerably to analysis of the functioning of legislative politics (Figueiredo & Limongi 1999, Anastasia, Ranulfo & Santos 2004). While agreeing that formally assigned powers matter in determining the holders of agenda and veto power, Aleman & Tsebelis (2002) argue that positional dimensions such as centrality of the agenda setter and dispersion of the veto players are fundamental in predicting policy outcomes. Along the line that "policy position matters", a parallel literature has

¹This model is co-authored with Paulo Melo, from the UCLA Economics Department.

developed and to further understand the ideological structure of parties in Latin America (Alcántara 1994-2000, Rosas 2005, Zechmeister & Luna 2005).

However, politics is not only about electoral rules, policy, ideology and institutionalized legislative processes. In Latin American presidential systems, appointments to cabinet positions and other high level executive posts are a matter of great political importance, and frequently reason for disputes among parties. The select club that decides these nominations has the daunting task of accommodating the interests of as many political players as possible using up the least amount of resources. As a result, this process usually selects men that profess allegiance to the president, but regard themselves, above all, as representatives of their own party or political group.

Many scholars have acknowledged that these “non-policy” issues matter. Perhaps the first to call attention to the coalitional dynamics of multiparty presidential systems was Abranches (1988), and since Geddes (1994) called attention to the different political uses of bureaucracies, several works have addressed the determinants of nominations to cabinet positions (Deheza 1997, Amorim Neto 1998, Amorim Neto 2006, Altman 2000) and a few others (Morgentstern 2004, Desposato 2004) have also directly or indirectly began tackling the issue of whether providing cabinet position does in fact affect the levels of support presidents obtain in the legislature.

The distribution of spoils, however, extends far beyond cabinet appointments, and proceeds very much on a day-to-day basis. Besides appointing the men to head the ministries, presidents can allow them more or less room to maneuver by controlling the flow of budgetary resources. Though these type of decisions follow macroeconomic concerns, there is also room for political manipulation of the budget. Direct bargaining can take place between the executive and legislative over how to run specific government programs.

A recent literature, mostly focused on Brazil, has explicitly began addressing the role of pork in the electoral connection (Ames 2001, Samuels 2003) and from there, began focusing on the politically motivated budget execution decisions (Pereira & Muller 2004, Alston & Mueller 2005). The punch-line is that locally minded legislators can blackmail the executive into making budgetary concessions. Accordingly, the executive uses its power to determine the execution level of amendments that individual legislators present during the budgetary process to maintain coalition members faithful.²

²As in other Latin American countries, the budget law merely “authorizes” expenditures. The executive

A competing position within this literature is defended by Figueiredo & Limongi (2002). Their main points are that the institutional prerogatives of the executive and the centralization of decision making within congress reduce individual legislator's capacity to extract personalist benefits to a minimum. Congress in Brazil has not organized itself to further the personal interest of legislators, as happens in the American case, which suggest that personal electoral concerns are not the driving force behind their actions. F&L also claim that even though some legislators do have votes concentrated in "informal" electoral districts, as found by Ames, many others do not, suggesting that at a minimum, a variety of electoral strategies are available. In fact, F&L claim that "the rational course of action for legislators is to act through parties" (p.306), and not bargain directly with the executive.

This paper contributes to this literature and to this debate by attempting to combine both pork and cabinet, as well as parties and individual legislators, in a single formal theoretic framework where the executive is the main player.

3 Overview

Ideally, the president would rather have all resources allocated to what I call "electoral investments", understood as any allocation of resources that can help further these goals, such as provision of goods to the electorate or simply "good" government.³ However, minority presidents are forced to spend part of their resources buying the support of parties and politicians that hold the key to governability, which I refer to as "coalitional investments."⁴ Obviously, electoral and coalitional investments are not always necessarily at odds with each other, but any president would rather spend more on the former and less on the latter. It could be argued that besides "electoral" and "coalitional" investments, a president could be also want to "pocket" some of these resources. In this paper I ignore

has the power to cap or cancel expenditures and to determine the schedule of disbursements.

³As Dias-Cayeros & Magaloni (2003) have argued, electoral investments will generally include a provision of mix of local public, universal public and private goods to the electorate. The exact mix to be provided depends, among other things, on the level of political competition.

⁴This assumption deserves a paper on its own, but in the current paper it serves two purposes. It provides the motivation for a for a cost minimizing approach to coalition formation, and also provides a possible bridge between the literature on executive-legislative relations with a parallel one focused on the executive's electorally motivated spending decisions, such as electorally guided spending in social programs and the provision of different types of goods to the electorate (Schady 2000, Dias-Cayeros & Magaloni 2003, Calvo & Murillo 2004).

this last alternative for two reasons. First, this type of corruption is frequently used to build “war chests”, and thus, would indirectly fall into the electoral investment category. Second, and foremost, this would not change the incentives for the president to minimize his coalitional investments. Future work will address these issues in more detail.

Those who have sought to address the issue of how presidents buy majorities in multiparty legislatures have either treated all legislators as free floating members of congress or treated parties as unitary actors. Alston & Mueller (2005), for instance, present a simple spacial model where patronage is treated as a second “valence” dimension and show that legislators on the ideological fringe of the president’s coalition should receive more transfers than those closer to the president. Though intuitive, this prediction implies that parties or legislators very close to the president’s ideological position would receive “no transfers” at all, which is far from true. In addition, A&M do not distinguish between legislators and parties. This is problematic because different resources get distributed in different ways, and while president’s *might* target pork execution to individual legislators, they also bargain with parties as a whole, such as when deciding cabinet appointments. Ministries are given out to parties and not to individuals, and in this respect the president’s party is usually favored. My model tries to account for this, and to understand the logic behind the choice of currency for each case.

If one decides, as I do, to take both parties and legislators into account, variables such as number, size, discipline and position of parties enter the analysis. As a consequence, the problem could quickly become intractable, offering no clear insights into how party system variables affect the distribution of resources. For instance, if there is a party close to the president I would expect that costs of coalition formation should be lower the larger and more disciplined it is, because its members should have a higher stake in the success of the government and also share at least some of the president’s policy preferences. However, the opposite should hold for parties further away from the president. The multiple interactions between variables make their final effect hard to disentangle, especially in cases with multiple parties. In this context it is very hard to answer whether it cheaper to buy off many small disciplined parties or fewer undisciplined parties.

My stylized president faces a legislature composed of parties, which are depicted as distributions of individuals with some exogenously defined level of affinity towards the

government. Given the distribution of affinities, the president decides how his political resources should be invested. Though the depiction of the president as a strict cost minimizer might seem simplistic, it indirectly captures the standard ideas that presidents are driven by the desire to invest the most resources possible on the direct advancement their political career, improvement of their reputation, on securing their place in history, or any mix thereof. From this point of view, resources distributed to coalition partners should be kept to a minimum.

“Affinity,” which I represent by X , lies on a continuum that is *not* a left-right policy dimension, but rather a pro-anti president dimension.⁵ The affinity value X can be understood more broadly than simply ideological preferences (or preference over the level of provision of certain universal public goods) to include one’s personal attachment to the president and also one’s stake in the future of the government. For instance, a legislator whose career path has been linked to the president’s, or who has become the “president’s man” in some district would have high affinity. A politician that is a long term rival of the president, even if not too distant in terms of policy preferences, would have lower affinity.

The president anchors the affinity continuum at its left side,⁶ and there is some cut-point in the affinity scale that separates those that support and those that oppose the president.

The legislators’s utility is an additive function of their affinity towards the president and political favors received from him. Legislators care these favors because they increase their political consumption level, which includes any resources that translate into higher reelection probability, as actual private consumption, or any mix of these categories. As a consequence, the provision of political favors has the effect of drawing legislators to the president’s side. The president’s problem is how to obtain the support he needs using up the minimum amount of resources.

⁵I borrowed this setup from (Dixit & Londregan 1996) and adapted it to my needs. D&L use distributions to depict voter blocks that will be targeted by redistributive policies implemented in a two party legislature. In their piece, parties have to decide which groups to tax and which groups to provide benefits, and groups decide which party to vote for.

⁶Note that if one wants to think in term of a more traditional ideological dimension, both politicians ideologically to the left and to right the of the president can be equally distant in terms of the affinity scale.

4 The Model

In this section I present the characterization and the general solution of the president's decision problem of using resources to obtain support in a multiparty legislature. As will be further explained, the president controls the two types of "goods" that interest legislators. The first can be thought of as cabinet positions and other high level appointments, which are treated as *club goods* that benefit all members of a given party. *Private goods*, on the other hand, are allocated individually to legislators and are meant to capture specific pieces of pork or lower level appointments that benefit legislators individually.

For ease of presentation, a considerable number of steps and proofs were omitted from this version of the formal model. A complete version of this model is presented in a working paper coauthored with Paulo Melo, a Ph.D. candidate in UCLA's Department of Economics.

4.1 Environment

Legislators: Legislators have preferences based on *political favors* they can receive from the president, and on whether they *vote with or against the president*. The former results from the president's decision as to how to allocate different types of resources under his control while the latter depends on legislators' *affinity*, which can be understood as an exogenous bias of the legislator with respect to the president. We assume legislator's preferences are determined *exclusively* by the benefits received and how he votes, not being directly affected by policy.⁷ Let C be the level of political benefits received by a legislator and X his affinity. This legislator's utility is defined as

$$U = \begin{cases} v(C) + X & \text{if voting against the president} \\ v(C) & \text{if voting with the president,} \end{cases} \quad (1)$$

with $v(0) = 0$, $v'(C) > 0$ and $v''(C) < 0$.

⁷This implies that legislators do not care about the outcome of the vote. We believe these assumptions are empirically sound. 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. Constituencies, which tend to be more concerned with local service or. Pressure groups, such as unions or business, might question the way legislators *voted* in particular votes, but will not blame the policy outcome on the legislator. Finally, his standing within his party can depend on his particular behavior on a stance, but not on the policy outcome.

For any given level of political benefits provided, a legislator with $X > 0$ would prefer to vote against the president. However, a legislator with $X > 0$ who receives no political benefits ($C = 0$) would be willing to vote with the president *in exchange* of receiving some $C > 0$, as long as $v(C) - X \geq 0$.⁸

Parties: Legislators are divided into J identifiable parties, with each legislator belonging to only one party.⁹ Each party is composed by a continuum of legislators with mass $N_j > 1$, whose affinities (X s) are distributed according to the density function $\phi_j(X_j)$ (and cdf $\Phi_j(X_j)$). The distribution of legislators among parties and, therefore, the affinities distributions for the different parties are exogenous.

Political Favors: The president controls the allocations of two types of “goods” he can use to obtain political support in the Congress: *club goods* (M), that he allocates to parties and benefits all party members; and *private goods* (P), allocated individually to legislators. Neither of these are straight out cash transfers, but in this paper we assume both have monetary equivalents, such that the two types of favors can be compared and “added.” The club goods are typically cabinet positions (Ministries or other high level positions) that are given to parties and that politically benefit all of its members in proportion to the amount of resources controlled by each appointment.¹⁰ The private goods can be thought of as *Pork*, that benefit legislators individually. The provision of both types of political favors depends on discretionary decisions by the president. In the case of Brazil, which we deal with in the empirical section, one source of legislator specific pork are budget amendments presented by individual legislators.

Transfer Technology: From the president’s perspective, the main difference between those goods is their respective “transfer technology”. For club goods M , we assume that 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 $\frac{1}{N_j} < \mu'_j(M_j) < 1$. For the private goods P ,

⁸For simplicity, we will assume that whenever a legislator is indifferent, he votes with the president. Note also that though legislator’s are obviously discrete, for modelling purposes they are subsumed in a “continuum” of legislators. Therefore, X indexes legislators.

⁹Though we will refer to parties, these could be thought of as any kind of political groups, such as parties, regional groups or factions.

¹⁰Though these appointments are discrete, their monetary equivalent is continuous.

we assume the amount received by the 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 benefit provided by the president. For the president, the costs of M and P are the same. Therefore, the assumptions on $\mu_j(\cdot)$ guarantee that there are economies of scale when using M but, if the president wants to benefit a specific legislator, it is cheaper to use P because the economies of scale would be wasted with "free riders".

4.2 The Decision Problem

For some given distribution of affinities (X), the president can induce more legislators to vote with him either by providing political favors to parties, or directly to legislators. For each party j , the president allocates M_j and $p_j(X)$ ¹¹ **in exchange** for the votes of all legislators in the party with $v(m_j + p_j(X)) \geq X$. 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. Legislators' choice is really between getting X and not voting with the president, or voting with the president and receiving $v(m_j + p_j(X))$. Hence, an increase in transfers causes some votes to switch over to the president's side.¹² 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.

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). Thus, he needs to choose an allocation of resources that satisfies the "quorum restriction" given by

¹¹Actually, legislators in the same party j and with the same X could, in principle, receive different P s. However, because we assume a continuum of legislators, the president's optimal allocation will always give the same amount $p_j(X)$ for all of them, as we show later.

¹²Again, we assume that legislators who are indifferent will take part in the arrangement, voting with the president.

$$\sum_{j=1}^J N_j \Phi_j(X_j^*) \geq Q, \quad (2)$$

In Equation 2, X_j^* is the cutpoint between those legislators that will vote with the president after receiving transfers and those that will not. In the complete version of this problem, it is shown that this also implies the existence of another cutpoint $\tilde{X}_j \leq X_j^*$ such that only legislators between these two cutpoints receive M and P . The existence of these two cutpoints allow the president's decision to be stated as:

$$\begin{aligned} \min_{\tilde{X}_j, X_j^*} \sum_{j=1}^J (M_j + P_j) \\ \text{s.t} \\ \sum_{j=1}^J N_j \Phi_j(X_j^*) \geq Q \\ \tilde{X}_j = v(\mu_j(M_j)) \\ P_j = \int_{\tilde{X}_j}^{X_j^*} N_j \left[v^{-1}(X) - v^{-1}(\tilde{X}_j) \right] \phi_j(X) dX. \end{aligned}$$

Though this setup is quite opaque, this problem can be much more intuitively approached if one analyzes its first order conditions. Besides meeting the minimum quorum restriction, an optimal decision has to meet a *within parties* and an *across parties* condition, defined as follows:

Within parties: This represents the *Marginal Rate of Substitution* between in P_j and M_j , keeping the votes from party j constant, and thus refers to the optimal provision of favors within the same party.

$$N_j \left[\Phi_j(X_j^*) - \Phi_j(\tilde{X}_j) \right] \mu'_j(M_j^*) = 1; \quad (3)$$

Given the number of votes the president will need from some party j , X_j^* is defined. The question then becomes which balance between M and P the president will provide to obtain the necessary votes. \tilde{X}_j determines M_j , and consequently the legislators that will

receive P in addition to m_j . Equation 3 shows that \tilde{X}_j will be such that the president is marginally indifferent between providing M or P . The left hand side (LHS) shows how the president's expenditure in P_j changes in response to a change in M_j , keeping the number of votes constant. This must be equal to the relative price, which is one, since both goods are represented in terms of expenditure.

The idea is that when M_j changes, the consumption of all the legislators changes by $\mu'_j(M_j)$, which is how much $P_j(X)$ must change to keep the votes constant. The total effect is given by this change multiplied by the number of legislators receiving P . Therefore, if the LHS of equation 3 is greater than one, the president would want to increase M_j , because by doing so, he can reduce the amount expended in P , more than compensating the additional expense in M . The analogous argument shows also that, if $M_j > 0$, we cannot have $X_j^* = \tilde{X}_j$, which means $P_j > 0$.

Across Parties: The 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.

$$\left[v^{-1}(X_j^*) - v^{-1}(\tilde{X}_j) \right] = \left[v^{-1}(X_k^*) - v^{-1}(\tilde{X}_k) \right] \quad j, k = 1, \dots, J. \quad (4)$$

To determine how to allocate resources between parties in order to meet the minimum support threshold, the president must compare the marginal cost of buying votes from different parties. Equation 4 states that the marginal cost of the vote must be equal across parties, and that it can be measured as $p_j^*(X_j^*)$. The reason why we can think of the marginal costs of buying votes in a party strictly in terms P is that, even though when we change X_j^* to get the marginal vote, we may change also M_j , the optimality condition *within parties* guarantees that the marginal effect of the change in M_j is compensated by the change in P_j that would keep the votes constant. Thus, the total effect will be just the additional expense to bring the legislator at X_j^* to the indifference, which is given by $p_j^*(X_j^*)$.

4.3 The Optimal Solution

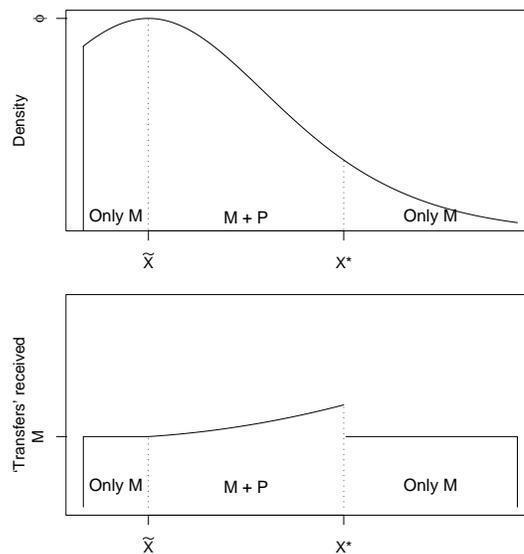
Together, Equations 2, 3 and 4 fully characterize the president's allocation of resources that minimizes the cost of obtaining the minimum threshold of support, as long as such

problem has an interior solution.

Not all parties receive M (cabinet positions), but all parties receive some amount of P . In fact, the marginal legislator across in all parties receives the same amount of P , which is an implication we will attempt to test in the future.

Figure 1 depicts the the situation within an arbitrarily given party. Legislators to the left of X^* will vote with the president, while legislator's to the right will not. Legislators between \tilde{X} and X^* and are the ones that also receive P . In general, the president uses M to buy off the bulk of his coalition. However, our model shows that even if there are economies of scale from using M , the marginal legislator will always be bought off using P . The intuition behind this result is that M also benefits members of the party that will not vote with the president, so in some circumstances the president is better off providing a more targeted good.

Figure 1: **Solution**



5 Model Meets Data

As a first attempt to gauge how well the model performs against real world data, I present a simple exercise using data from Brazil for 2003 and 2004. I simulate the president's decision environment by feeding the model empirical stylized "parties" that approximate

real world conditions, and then compare the outputs of the model with the observed patterns of votes and distributions of pork and cabinet positions.

Before showing the results of the actual simulations, which I do in Section 5.2, I spend Section 5.1 discussing the numeric assumptions that were necessary to run the simulations.

5.1 Numeric Assumptions

The algorithm used to obtain the predictions is mostly a straightforward implementation of the optimality conditions described in the previous section, adapted to deal the possible corner solutions that arise whenever a party receives no M . Details are given in the Appendix B. In the simulations that follow, I assume $\phi_j \sim \text{logistic}(\lambda_j, \sigma_j)$, define the utility function as $U(C) = C^{1/2}$, and the technology function as $\mu(M_j, N_j) = \frac{kM_j}{N_j}$, with $k = 3$.

The distribution of X : The use of the logistic distribution is justifiable in conceptual terms, is a fairly realistic approximation of my operationalization of “affinity”, and brings the advantage of a convenient analytical form. Conceptually, I believe it is not overly restrictive to assume that whatever the underlying distribution of affinity within a party might be, it be symmetrically and monotonically decreasing around some mean. Empirically, a bell shaped distribution of affinity is a reasonable match to the way I operationalize “affinity” (Section 5.2).

The main potential pitfall of using the logistic distribution is that it *can* produce multiple equilibria. This problem affects most distributions with the possible single exception of the uniform. I analyze this issue in more detail in Appendix A, but it is worth noting that this problem only arises under very specific circumstances, and even if multiple equilibria do exist, the solutions presented bellow are nonetheless optimal (though possibly not unique).¹³

The technology function: In my simulations, k is a parameter that captures the economies of scale in providing M rather than P . If k were 1, M and P would be equivalent. The greater k is, greater will be the advantage of using M relative to P . If

¹³As a work-around solution, for this paper I always use zero as starting values for the optimization routine. Not only this prevents any extra “ad-hockery,” but it also resembles the real world situation I am modeling, where the president begins his calculations in control all of the resources.

$k = n$ then each member of the party would receive the equivalent of what is given to the party as whole. Therefore, in principle $k \in [1, \min(N_j)]$.

In the simulations that follow I use $k = 3$. This value is somewhat arbitrary and was chosen to “calibrate” the model and improve its joint fit both years of data. Varying the k from 2 to 4, however, does not change the simulations considerably.¹⁴

The utility function: The use of $U(C) = C^{1/2}$ is a simple specific form of the general utility function used in the model that meets all the theoretical assumptions made in Section 4.

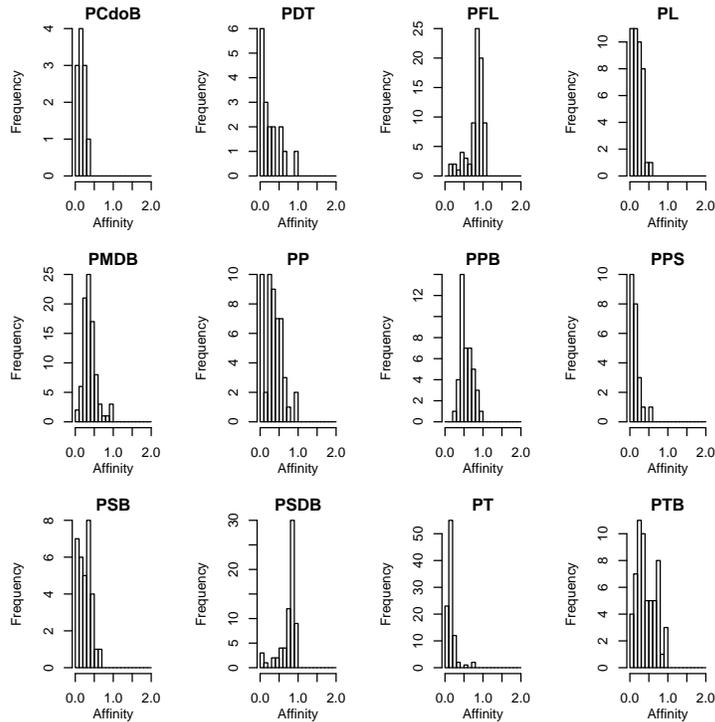
5.2 Making Predictions

Given the numeric assumptions explained above, my parties are distributions of X defined by their size, mean and st. deviation. I approximated these values using party size at the beginning of each year and the mean and st. deviations along X computed using roll call data from the **previous** year. More specifically, I obtained X 's by estimating each legislator's position in the previous year using nominate, re-scaled all ideal positions to the absolute distance between legislators and president, and then recorded the mean and the standard deviation for each party (Appendix C provides more details on the data that was used).

Obviously, this is not a truly “exogenous” measure of affinity. After all, the previous' year roll call votes are a product of the previous year's provision of political favors. The upside is that, at least, this is not as redundant as using the current year's roll call patterns, especially if I consider that between 2002 and 2003 (one of the year's used in my model) there was a presidential change. Between 2003 and 2004 changes were less acute, but there was still some variation on the composition of government's coalition. Under this setup, Figure 2 is my styled depiction of the president's problem.

I concur with many objections to this procedure, however it is not clear what the alternative is. The fundamental problem here is that “affinity” is non observable. The observed roll call patterns are, in fact, part of the output of the model along with the distributions of pork and cabinet positions, and not truly inputs to the model as I treat

¹⁴For future versions, I intend to use a technology function μ that allow's for decreasing rather than constant gains of scale.

Figure 2: **Example from Brazil 2003**

them here. Given this situation, one could go down an inverse empirical strategy of backing out the affinities from the observed outcomes. Though this would be more true to the model's predictions, the most that would be achieved is to arrive at distribution of affinities that *could* have generated the observed data. However, it is not obvious that there exists any yardstick against which to measure this distribution.

Another option closer to what I actually do in this paper would be to come up with a measure of affinity not computed from roll call data. In this respect, I imagine that some combination of surveys and legislator specific data such as years in the party, patterns of party switching, and previous history of electoral coalitions could be used. My empirical work will definitely continue in this direction, as I continue to seek ways of making the data analysis more robust.

I used this estimated measure of affinity as inputs to the model to generate predictions about what the optimal allocation of pork and cabinet positions should be, as well as what the expected number of votes each party contributes to the president given this allocation of resources. In this section, I discuss the how well these aggregate party level predictions

fare against real world data. It is important to note that the model also yields individual level predictions as to how much pork each legislator should receive and how he should vote, but for lack of time and space I leave the task of analyzing these predictions for future work.

I start by looking at the model's pork allocation predictions, which are the percentage of the total pork predicted to be given to each party. Using data from the Brazil, I compare these predictions with the actual execution of legislator amendments to the budget. In Brazil, the executive sends a draft budget to congress, and legislators are allowed to present amendments.¹⁵ The amendments usually benefit legislator's constituencies, but as is true with the rest of the bill, the budget only "authorizes" expenditures. The executive has the final say on appropriations, and given that revenues are usually overestimated and there is a perennial need to shore up primary surpluses to meet debt servicing need, most amendments are not executed or executed only partially. As has been said in the literature, bargaining over the actual execution of these amendments is a central part of executive-legislative relations in Brazil¹⁶.

Figure 3 compares predictions and actual values of pork execution. Perfect predictions would fall along the diagonal line. At a first glance, it is already evident that predictions for 2004 are much better than the ones for 2003. In fact, in 2004 the sum of squared deviations from the observed values drops from 0.049 to 0.012. A closer look indicates that in 2003 the model underestimates the shares of pork of larger five parties while overestimating the amounts that correspond to the smaller parties.

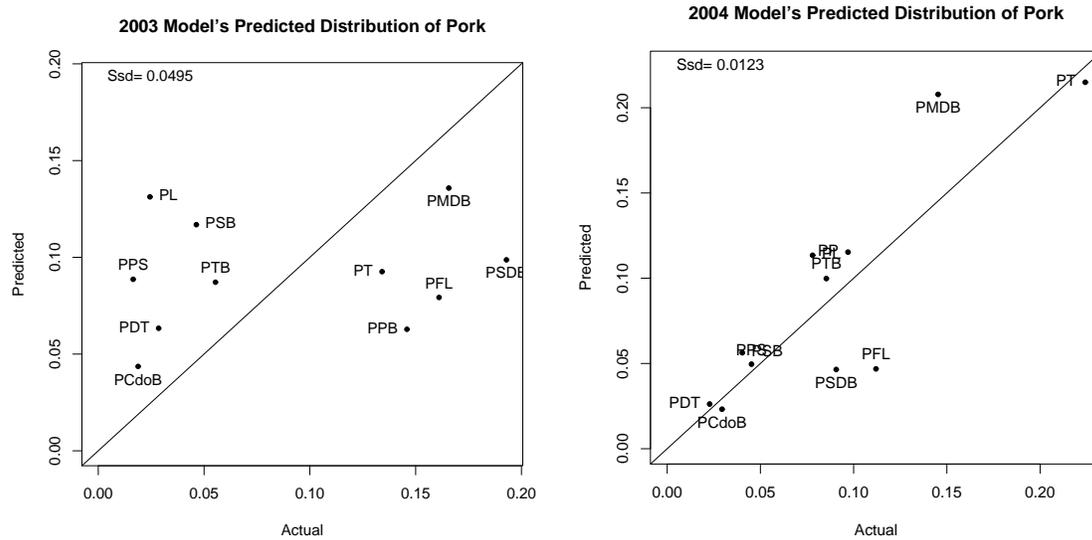
This discrepancy comes as no surprise, for 2002 was an election year. Retention, measured as the share of legislators present in the first vote in 2002 who were also present in the first vote in 2003, was only around 52%, and consequently many of the legislator's that introduced amendments to the budget in 2002 were not around in 2003.¹⁷ Therefore, even if the president behaves as I expect him to, the results of the distribution of pork would still probably be different than what I predict, for not all legislators that presented amendments the year before remain in Congress to lobby for their execution. Though other mechanisms besides presentation and execution of individual amendments to the

¹⁵For the years used, legislators had a quota of 20 amendments for a total of up to 2 million reais.

¹⁶Note that (Figueiredo & Limongi 2002) question the importance of these amendments.

¹⁷Between 2003 and 2004 retention was around 95%.

Figure 3: Pork Distribution



Notes: In both graphs the horizontal axis are the observed values of pork, computed as the shares of executed “pure amendments” proposed by party members relative to the total of pure amendments executed the given year (See Appendix C for more details). The vertical axis are the values predicted by my model, also measured as the shares of total pork that corresponds to each party.

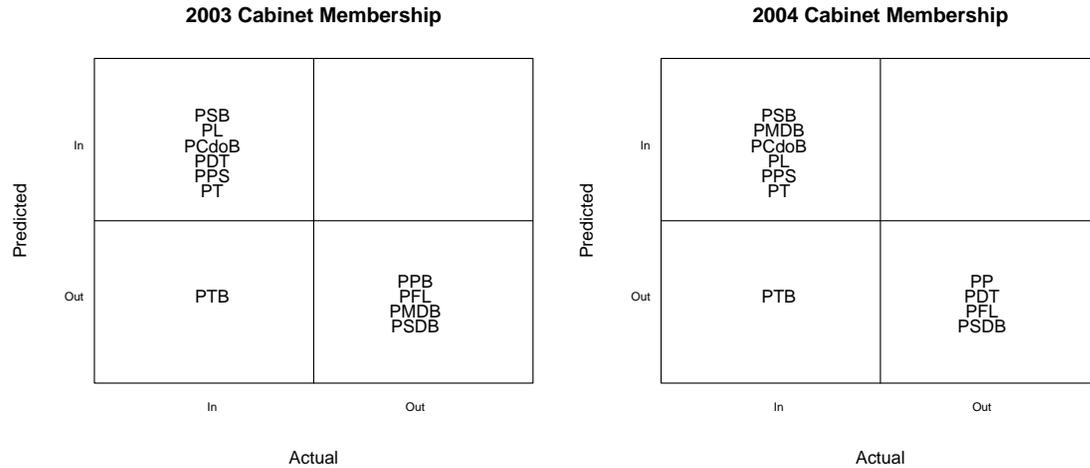
budget by which legislators can take credit for the delivery of pork exist, I cannot account for them with the data at hand.

Compared to Alston & Mueller’s (2005) model, the only other formal analysis of this problem I am aware of, my model’s predictions are more realistic. While they predict that the further away coalition members are, the more pork they will receive, their model takes membership in the coalition as exogenously given, and is mute regarding how much pork non coalition members should receive. Additionally, in their model, the president’s party should receive no pork at all, which is far from being true. Additionally, my model has implications that extend beyond simply distribution of pork, and I now turn to them.

The model also makes predictions about cabinet membership, as shown in Figure 4. In reality, since M is continuous, the model makes more fine grained predictions than simply predict membership or not. I hope to eventually use budgetary data, such as the size of the budget commanded by each ministry, to better analyze the fit of the model.¹⁸ However, since this involves dealing with intricacies of the budget, it is yet another task

¹⁸Following Figueiredo & Limongi (2002), the best fit is probably to use the investment budget of each ministry, since that is the most politically useful and more flexible component of the budget.

Figure 4: Cabinet Membership



Notes: Actual Cabinet membership is coded as of March of each year. Parties were considered as predicted in the cabinet if the model assigned it $M > 0$.

that I leave for future work.

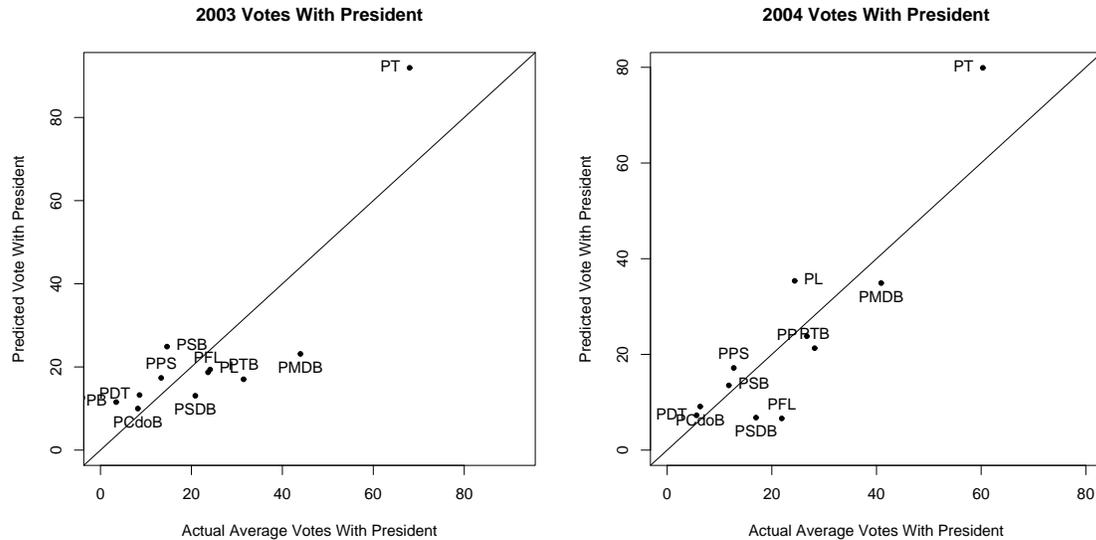
Here my model performs extremely well. For both years, the only mistakenly classified party is the PTB, which has been an early ally of the Lula government despite my model predicting it should not be in the cabinet.¹⁹ Note that my model is sensitive enough to predict that the PDT would be in the cabinet in 2003 but not in 2004, and that the PMDB would not be in the cabinet in 2003, but would join the government in the following year.

It is again useful to compare these results with a baseline model. For the cases at hand, if one were simply to use the same affinity scale as ours and predict the cabinet would be a minimum connected winning coalition (Axelrod 1970), results would be similar, though less accurate than ours. For 2003, such a model would only err by including PMDB in the cabinet, while for 2004 it would mistakenly exclude PTB and include PDT and PP in the cabinet. However, another implication of the minimum connected winning coalition logic would be that the “ins” would vote with the president while the “outs” would vote against him. In contrast, my model states that the president will obtain votes across coalition lines. As Figure 5 shows, my model also performs decently in predicting the number of

¹⁹I find some comfort in the fact that PTB leader, Roberto Jefferson, triggered in 2005 the major corruption scandal that came close to bringing down Lula’s government. The scandal originated when corruption allegations involving PTB’s appointees in the government surfaced, and Jefferson grew resentful that the government did not act to protect him. Had Lula behaved “optimally”, he would not have included the PTB in the cabinet, and perhaps none of this would have happened.

votes the president should obtain in each party.

Figure 5: **Votes With President**



Notes: The horizontal axis is the average number of party members voting with the president across all votes in the given year. The vertical axis is the number of votes my model predicts the president will receive in each party.

6 Legislative Capitalism: An Extension of the Model

After decades of heavy state intervention in the economy during which sprawling state bureaucracies were established, Latin America witnessed during the 80's and 90's sweeping economic reforms that changed this reality in a profound way. Structural adjustment and market oriented reforms have dominated much of the political agenda in Latin America in the last decades and profoundly changed the political and economic landscape in the region. Most countries underwent significant liberalization of trade and finance, made fiscal balance a priority (albeit with varied degree of success), and engaged in extensive privatization of banks, industries, utilities and infra-structure, which aimed at removing the burden of investment from the State, collecting revenue form the sales, and improving services.

Prior to the reforms there was an abundance of resources over which to bargain. Therefore, it is reasonable to expect that the resulting budget constraints imposed by

greater openness to capital and privatization have shrunk the pool of political resources controlled by presidents, thus furthering the need to rationalize the way they use resources to build support. In essence, the argument is that the reduction in the distributional resources might have forced politicians into a different negotiating equilibrium. If the president's pool of resources shrinks, there can be a significant impact on how politics is conducted. In this section I argue for a president that controls less resources, bribes legislators to obtain support might be a rational strategy.

6.1 Reforms and resources

The first question to ask is whether, in fact, what we call "reforms" might have had the effect of reducing the resources at the president's disposal. In this respect, some concrete examples can be drawn from the numbers regarding state owned enterprises. These were not only an important source of political appointments to high positions and of general employment in lower positions, but were also politically useful in setting the prices of basic services and also of providing services in exchange for political support.

In Brazil, more than 150 companies were sold or liquidated by the federal and state governments, shedding just under 300 thousand jobs and reducing the number of public companies to 96 in 1999.²⁰ As a consequence, while prior to privatization government-owned companies accounted for roughly one third of the industrial sector of the country, by the year 2000 this participation had shrunk to less than 10%.²¹

Similarly, in Argentina, there are now just around 30 federally owned public enterprises with around 7 thousand employees, down from close to 200 companies employing more than 300 thousand people at the beginning of the 1980's²². In Bolivia there were approximately 150 public companies in the mid 80's employing more than 50 thousand people whereas now there are less than 30 companies with no more than 3 thousand employees²³. The government of Peru has also privatized the great majority of its public sector holdings, including all of its holdings in the financial, fishing and telecommunications sectors and a majority of its holdings in the mining, hydrocarbons and electricity

²⁰See http://www.planejamento.gov.br/controle_estatais/conteudo/perfil/index.htm, the official website of the Brazilian Planning Ministry.

²¹BNDES - National Development Bank: <http://www.bndes.gov.br/privatizacao/pndnew.asp>

²²Data provided by the Library of Argentine Economy Ministry, Ugalde (1984) and CLAD.

²³Data provided by the Contaduria General de Bolivia, CLAD and Latin America Weekly Report (1982), "BOLIVIA/PARTIES", October 22, 1982, WR-82-41; Pg. 11, Online. Lexis Nexis Academic. Jan 2006.

sectors.

The reduction on the role of the state was also felt in terms of the central government employment figures, which have seen a decline in most countries, though in this respect reforms might actually be carried out without affecting the president's capacity to cater to political elites. For example, general public employment can be reduced without affecting the number of politically appointed positions, and governments can frequently create "temporary" positions and hire well paid consultants in internationally funded programs in order to circumvent caps on the hiring of regular public employees (Tommasi & Spiller 2006), or outsource lower paid jobs to service companies that might still hire according to political factors.

Fiscal requirements of the post reform period might also have limited the ability of the executive to buy support. The use of exchange rate based stabilization plans and greater openness to capital flows, so characteristic of the economic reforms throughout the region, resulted in increased indebtedness and greater reliance on foreign capital, which has considerably increased the pressure for better fiscal results. In fact, average fiscal results in Latin America have improved from -9.1% in the 1980's to -3.3% in the 1990's, reaching -1.4% in 2004, according to World Bank figures.²⁴ One should still consider that these figures are *after* interest payments, which in some countries have risen considerably during the past decade. As a result, governments sometimes ran large primary surpluses which significantly reduced public investment and expenditure. This tighter budget constrain has been clearly felt inside each country.

6.2 Rationale

But how does this fit in with the current paper? Using the language of the model presented in section 4, consider that both M and P are subject to a public resource constrain. If an exogenous factor, such as reform, reduces the availability of these goods, it is possible that the budget constrain might become binding. If this is the case, the president will not have the resources necessary to govern.

One way the president might respond to this changed situation is by developing more cost efficient methods of buying support, which might be the rationale behind the Car-

²⁴Global Development Finance 2004, p.181

doso's government implementation of the SIAL, as described by Pereira & Muller (2004). One could also argue that presidents would shift focus to using intangible goods, such as political endorsements or ideology to try to substitute for lack of politically valuable resources. However, in the remaining of the section I tentatively explore an alternative "solution" to the president's problem.

Let there be a third type of good controlled by the president, which for simplicity I will call "bribes." Differently from pork and appointment to high positions, this good is not subject to the president's public budget constrain. As with pork, bribes can be targeted, have a larger unit value, since they are completely fungible and can be used in whatever way the recipient sees fit, but they carry the disadvantage of generating a large scandal with some probability.

If this probability of generating a scandal is large enough, presidents will usually not resort to bribes. However, as their resources dwindle, bribes become a more attractive option. A lower budget constrain on "legal" political trade goods might make bribing legislators an optimal strategy, which suggests that This suggests that under certain circumstances bribing legislators might be cost efficient for the government.

In fact, it might even be the case that the reduction of resources does not have to be as radical as to make the budget constrain binding. As the budget constrain lowers, the supply of "legal" goods (P and M) is reduced, thus affecting its relative price vis-a-vis the "illegal" option. Such change can be enough to make the illegal option attractive.

6.3 Evidence?

A recent class of phenomena that has to be added to this list is the direct "purchase" or bribing of opposition congressmen by the executive in exchange for support. Major scandals of this type have occurred in Peru in September 2000, Argentina in October 2000, are at the center of the current crisis in Brazil and has been routine in the past 15 years in Bolivia. These examples all come from aggressive reformist countries, and here I speculate that this is not mere coincidence.

With the understanding that better indicators of the size of the pool of resources available for political distribution need to be developed, I use some easily available data to describe the variation in reform in the region. Though extremely tentative, this first

Table 1: **Extent of “Reform” during democratic periods**

Country	Relative Change in SPE*	Absolute Change in SPE*	Change in Reform Index
Argentina	-77.94	-30.04	-0.314
Ecuador	-56.17	-23.20	-0.283
Peru	-53.10	-18.00	-0.451
Brazil	-52.50	-18.90	-0.371
Bolivia	-44.81	-27.20	-0.371
Chile	-40.00	-8.20	-0.088
Venezuela	-29.14	-19.00	-0.250
Colombia	-25.42	-13.70	-0.214
Paraguay	-24.30	-11.20	-0.088
Uruguay	0.00	0.00	-0.096

*Public enterprises and investment as share of GDP.

approximation to the issue will help illustrate my argument. Since the argument is about how politicians adapt to **changes in resources**, it is important to focus on the variation (rather than level) of these resources. For instance, the argument does not apply to changes that happened while parties were banned, as in Chile, because when parties returned to activity the new constraints were already in place.

Table 1 presents the variation in the “share of government enterprises and investment as a share of GDP” during the current democratic period.²⁵ The countries can be divided into “aggressive” and “timid” reformers. Though the cutpoint is somewhat arbitrary, it roughly matches the stylized facts about the countries and is not too sensitive to the specific data used.²⁶ Uruguay is a notoriously slow and timid reformer while Chile carried out most of its reforms during authoritarian rule, thus did not have much left to privatize after the return to democracy. On the other hand, Bolivia and Argentina are examples of fast and drastic reform, Brazil was late to start but ended up with the largest privatization program in the world, and Ecuador dolarized the economy and underwent privatization and state reform efforts in the end of the 1990s.

In four of the aggressive reformers, there has been some instance of presidents bribing legislators in exchange for support, and in all cases this happened after the bulk of the reform period. In the following paragraphs I briefly and informally describe these cases.

²⁵I used data from Area I - C of Gwartney, Lawson & Gartzke’s (2005) index of economic freedom, which covers all countries in the world from 1970 on, with observations every 5 years. I computed the difference between maximum share of public enterprises since the return to democracy and the share in the year 2000. For countries with no authoritarian period I used 1978 as the reference year.

²⁶Very similar results are obtained by using changes in the Index of Reform developed by Morley, Machado & Pettinato (1999), which are reported in the last column of the same table. The main difference is Ecuador, which carried out most of its reforms at the end of the 90’s, a period not covered by these other data.

Please note that I have not yet carried out a thorough systematic analysis of all these cases, nor searched for such episodes in the timid reformer countries. Therefore, this analysis is far from conclusive.

Peru: In September 2000 the appearance of a video in which Vladimir Montesinos was shown paying congressman Alberto Kouri \$15,000 to enter the president's support group initiated the process that ultimately led to the resignation and auto-exile of Alberto Fujimori. After the fall of his government, hundred of other "vladvideos" became public, providing evidence that the same strategy had been used with other legislators and assured Fujimori a majority in the legislature.

Through this method, Fujimori was able to expand his support base from 52 to around 70 legislators, even before the recently elected 120 member parliament was sworn in. The final list of those involved in the corruption was 21 names long (18% of parliament) and included "transfugas", as were called the legislators who effectively switched parties, "topos", the infiltrated *fujimoristas* in other parties, and members of Fujimori's own party that received illegal campaign contributions from Montesinos.

Argentina: Given the magnitude of the Argentine meltdown of December 2001, probably few people outside of Argentina remember that the political crisis in the De la Rúa government began in October 2000 when allegation surfaced that the executive had paid *peronista* senators between 50 and 80 thousand dollars to vote with the government on the labor reform bill. The scandal was particularly damaging to the government since De la Rúa had been elected on a platform of moderate political change, with an emphasis on clean government.

A few days after the scandal broke out, vice president Carlos "Chacho" Alvaréz resigned, leading to the eventual withdrawal of Frepaso from the government and the formal breakup of the *Alianza*. At the time, it was estimated that 11 senators had split a large bribe that, as in the peruvian case, had originated from discretionary funds of the "information" secretariat of the presidency. The following year the, the judiciary closed the case due to lack of evidence, but as corruption allegations against the main judge in the case have also become public, the case was reopened and in September 2005, 6 former senators were indicted.

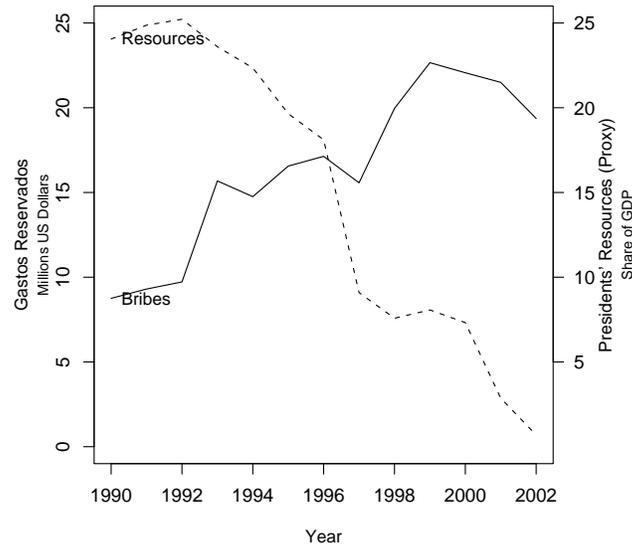
Brazil: The Brazilian case is probably still too recent to be written about. Nonetheless, at the center of the scandal is the accusation that the José Direceu, the government's Chief of Staff, commanded a scheme that made some type of periodical payments²⁷ to congressmen, specially to leaders and members of PTB, PL and PP, the smaller, coalition partners. The origin of the funds is still unknown, though there are suspicions that they originated from kickbacks paid by marketing firms with ties to the government. So far, a handful of legislators have lost their mandates or resigned, and more than 100 people (not all legislators) are said to have been involved in the scheme.

Bolivia: Though not having registered specific scandals of this type, Bolivia is the a case that illustrates this logic the best. Between 1985 and 2002, Bolivia enjoyed the longest and most stable period of democratic rule in the countries history. During this period, a sucession of coalition governments enjoyed unprecedented support from congress, to the point that relations between the executive and the legislative were commonly referred to as the *rodillo oficialista*. In almost all the interviews I conducted in the country, former ministers and legislators acknowledged that direct payment to legislators were a considerable ingredient of coalition making in the country, and the (not so) hidden secret behind the executive's supremacy.

Interviewees stated that the funds to bribe congressmen came mostly from an item in the budget known as *gastos reservados*. This item has the peculiarity of not being subject to public scrutiny, and was created to be used for issues involving national security interest. The practice of paying legislators began as a complement of legislator salaries, which are almost unanimously regarded as too low. However, by the end of the 90's, such payments are said to have become the main glue that kept bolivian coalitions together. Figure 6 shows this rough proxy for bribes paid out to the legislature increasing markedly as the State's legal resources dwindled.

Most interviewees pointed out that the bolivian parties became increasingly fragile during the decade. The most common reason that was cited was simply that leadership had wanned. Most interviewees like to compare the good old times of Estessonro, early Banzer and Jaime Paz, and how they exerted great influence over their parties. Others pointed out that several institutional reforms that lead to increasing decentralization, and

²⁷Popularly known as the *mensalão* or which roughly mean an "allowance".

Figure 6: **Bribes and Government Resources in Bolivia**

Notes: Government Resources is proxied by the share of the GDP accounted for by public companies, obtained from Bolivia's *Instituto Nacional de Estadísticas* excluding the "capitalized" firms, since these are not under public management. Bribes are approximated by the *Gastos Reservados* expenditures obtained from the National Accounting Office (*Contaduría General*). The actual budget item is *Gastos Específicos de la Administración Central*, found in the budget for the *Ministerio de Gobierno* identified as item 262 until 1993 and item 261 thereafter, which has the peculiarity of not being subject to scrutiny by any other authority.

contributed to the greater autonomy by individual legislators. The three main traditional parties also saw a gradual decline in their seat share, leading to alliances with

Those that participated in both Sánchez de Lozada governments, for instance, would commonly compare the two. In the first, Goni would hold regular meetings with legislators, regional party leaders, and allies, and though he always retained the final decision power, he was quite open to input from his colleagues. In the second government, in contrast, only but a very small and select group of four or five close advisers had access to the presidential palace. As interviewees pointed out, at this point government decisions were centralized and coalition partners and party members were simply told how to vote. In this scenario, the bribes became the essential glue holding coalitions together.

In the final period of the Goni government, apparently not only legislators, but many leaders of social movements were also on the parallel payroll. According to Ferrufino (2006), an official in the Mesa government, people would show up in the Ministry of Government to ask for their allowances even after Goni' had fallen.

An attorney in the *Defensoría del Pueblo* mentioned that “everybody” new *gastos reservados* were used to bribe legislators, but that there was very little accurate information on the topic. While I was in Bolivia, the government of caretaker Veltzé Rodríguez announced that the *gastos reservados* would be cut to a minimum just to keep security operations going. Perhaps not so surprisingly, Congress was so paralyzed it could not agree on how to implement a court ordered redistricting plan, forcing the president to solve the issue by decree and delayed the general elections in three weeks.

This *modus operandi* has been in place at least since the Paz Zamora government. One of the interviewees that downplayed the role of the *gastos reservados* in bribing congress claimed that the bulk of these resources were used in the fight against narcotraffic. According to the former head of the Ministry of Government, the size of the *Gastos Reservados* increased because of renewed coca eradication efforts, and not because of increased handout to legislators. To check for this, I regressed *Gastos Reservados* on a proxy for resources, controlling for coca eradication.

As is common with time series, the data display moderate serial autocorrelation.²⁸ The most commonly employed techniques for dealing with this problem are the inclusion of a lagged dependent variable in a standard OLS regression and the use of auto-regressive methods. In table 2, I show the results of both techniques.

Talk about Amelia

The measure of government resources used is not the only possible one, so a positive result for this variable is only indirect evidence of claim made here. Results should furthermore be discounted because the small number of observations restricts the number of controls that can be used. Nonetheless, the measure of state resources did show acceptable levels of statistical significance in both models, which do control for the government’s coca eradication efforts. While coca eradication efforts apparently have no discernible effect on the size of *gastos reservados*, a one percentage point decrease in the participation of public the productive sector in the GDP is associated with a US\$314.000 to US\$400.000 increase in *gastos reservados* expenditures.

²⁸ Autocorrelation is 0.35, for a Durbin-Watson statistic of 0.71. The null of no autocorrelation is rejected with a p-value of 0.000.

Table 2: **Determinants of Gastos Reservados**

	OLS LAG DV	AR-1 Coch-Orch
Intercept	14.169	7.537
Std. Error	4.661	65.522
$Pr(> t)$	0.012	0.910
Gvt Resources	-0.314	-0.400
Std. Error	0.102	0.192
$Pr(> t)$	0.012	0.063
Coca Eradication	-0.011	0.143
Std. Error	0.228	0.255
$Pr(> t)$	0.963	0.587
Lag D.V.	0.414	
Std. Error	0.148	
$Pr(> t)$	0.019	
N	14	14
R ²	0.80	0.43
Autocorrelation	-0.06	0.01
Durbin Watson Stat.	2.04	1.86
P-value	0.53	0.68

Notes: The dependent variable in all models is the value of *Gastos Reservados* measured in thousands of dollars (current). Government Resources is proxied by the share of the GDP accounted for by public companies, obtained from Bolivia's *Instituto Nacional de Estadísticas* excluding the "capitalized" firms, since these are not under public management. This series had missing values for years 2003 and 2004, which were imputed using Amelia software (King, Honaker, Joseph & Scheve 2001). Coca Eradication is the area eradicated in the year, measured in thousand has. AR-1 estimates were obtained by the Cochrane-Orchutt method, and results are reported after 10 iterations.

6.4 Summary

Corruption is by no means new. In fact, one can argue that one of the main reasons politicians seek nominations to certain key positions is precisely because they are a good source of corruption revenues (Gingerich 2004). However, the direct bribing of legislators in exchange for support is different, and brings corruption directly into the heart of executive-legislature relations. Thus, going beyond the traditional views of corruption for personal gain, or even the more sophisticated version of corruption as geared towards financing a

political party, this practice is a “new” form of coalition building that has been developed in the post reform period. The argument I present here, and to which I will devote further research, is that this development might have been a response to limitation of “legal” resources.

7 Conclusion

This paper proposed a generic framework in which the provision of political favors (pork and cabinet positions) by presidents to a multiparty legislature is treated as a problem of cost minimization. It also stated, analyzed, and solved the specific decision problem such a president faces, and presented some preliminary empirical support for the model’s predictions. The general framework was inspired by Dias-Cayeros & Magaloni’s (2003) approach of the provision of goods to the electorate, and the model’s mechanic by Dixit & Londregan’s (1996) paper on political redistribution.

I believe the model presented here improves upon the best preceding attempts to approach this issue formally, especially because it attempts to unify two parallel and variants of the literature on coalition formation in presidential systems — one on cabinet formation and another on pork distribution — and opens the way to merge this literature with the one about the provision of goods by presidents directly to the electorate.

I also believe to have incorporated at least some of the powerful criticism that Figueiredo & Limongi (2002) direct to the whole conception of executives buying support from locally minded individual legislators. In this paper, parties play an important role, bargaining with legislators is done on the margin, and the executive is the main actor. In principle, this is compatible both with a story where legislator’s amendments are crucial and one where this dynamic is marginal. For future work, I am considering expanding the present analysis into a game theoretical framework where party leaders have an important role in the bargaining. Such a model might be useful in analyzing internal party dynamics and might even unfold into an endogenous party formation theory, if one allows legislators to move to parties that provide the highest yields to their affinity.

Even before developing a more sophisticated theoretical apparatus, there is much to be done on the empirical side of the project. The idea of approximating affinity using previous year roll calls can still be improved upon by fitting distributions to the data

rather than just using empirically computed means and standard deviations to create the stylized parties, as I now do. I also plan on developing a truly exogenous measure of affinity, using surveys of legislators conducted by other scholars, and I still need to address the legislator level predictions, and the more nuanced predictions regarding the distribution of M .

Lastly, much more empirical research is necessary on the issue of legislative bribing before a convincing case can be made in support of the argument presented in Section 6.

Appendix

A Single solution

While the across party conditions yields a single solution, closer examination of Eq. 3 shows that there can potentially exist multiple solutions to the within party condition. In the coauthored theoretical working paper there is a more thorough discussion of the issue, which hinges on the fact that while $\mu'(M_j^*)$ is monotonically increasing in M_j , it is not clear how the bracketed term in Eq. 3. From the analysis of the second order conditions of the optimization problem it can be shown that the following condition must be met to ensure a single solution:

$$\frac{U'(m)}{U'(m+p)} > \frac{\phi(X^*)}{\phi(\tilde{X})} \quad (5)$$

The left side of the inequality is always greater than 1, so a constant $\phi(\cdot)$, such as the one provided by the use of a uniform distribution guarantees that the condition is met. However, the use of the uniform is very restrictive, and it much more reasonable to assume affinity is unimodally distributed around some average affinity. Two issues are of importance here:

- Since the uniform is a *sufficient* but not necessary condition, it is in principle possible to find less restrictive assumptions that meet the criteria. We have already understood that the use of more reasonable distributions such as the logistic only generates multiple equilibria under very specific conditions that do not affect most parties. In future versions of the theoretical paper we will describe these conditions more thoroughly and test for the robustness of the equilibrium found using randomly generated starting values for the optimization routine.
- Even if multiple equilibria are possible, any solution found is still optimal.

B Algorithm

The Algorithm is mostly a straightforward implementation of the three optimality conditions. The only caveat is that instead of choosing the \tilde{X}_j and X_j^* that minimize the president's costs we opted to solve analytically for \tilde{X}_j , and to optimize the resulting system of J equations only for X_j^* . This decision was made to allow for faster computation, and also to facilitate dealing with the issue of corner solutions for \tilde{X} .

Since the president is located at $X = 0$, all \tilde{X}_j and X_j^* have to be non-negative numbers. This is not much of a problem with X_j^* 's, since the use of a distribution such as the logistic, with infinite support, ensures an interior solution for the ‘‘across party’’ optimization problem. All parties have positive mass along the entire real line so Eq. 4 holds without alterations and all parties will have a positive X^* .

However, in some cases we might have a ‘‘corner’’ solution for \tilde{X} , in which case the marginal rate of substitution between P and M will not be equated to 1, as is required in the general ‘‘within party’’ condition (Eq.3). To deal with the possibility of corner solutions for \tilde{X} , we start by defining a threshold \hat{X} for which \tilde{X} will only be greater than zero if $X^* > \hat{X}$.

$$\hat{X}_j = \begin{cases} \tilde{X}_j - \sigma \log \left(\frac{1 - \frac{1}{k} - \Phi_j(0)}{\frac{1}{k} + \Phi_j(0)} \right) & , \text{ if } \Phi_j(0) > 1 - \frac{1}{k} \\ \infty & , \text{ otherwise} \end{cases} \quad (6)$$

We then define \tilde{X} as either zero, whenever the optimal solution is a corner, or as the \tilde{X} that meets the within parties optimality condition, if the solution is interior:²⁹

$$\tilde{X}_j = \begin{cases} 0 & , \text{ if } X_j^* \leq \hat{X}_j \\ \tilde{X}_j - \sigma \log \left(\frac{1 - \Phi_j(X_j^*) + \frac{1}{k}}{\Phi_j(X_j^*) - \frac{1}{k}} \right) & , \text{ otherwise} \end{cases} \quad (7)$$

Equations 6 and 7 ‘‘replace’’ Eq. 3 as our new ‘‘within parties’’ conditions. Along with the ‘‘across party’’ condition (Eq. 4) and the minimum support constrain (Eq. 2), these define the system of equations we solve for. Once \tilde{X}_j and X_j^* are obtained, it is straightforward to obtain predictions for M and P .

C Data

All data management, computations, simulations and graphs were done in R. Code and raw data are available from the author upon request.

²⁹The second case in Eq. 7 is simply the analytical solution to Eq.3

Roll Call votes, party sizes, and legislative retention figures were all computed from Limongi & Figueiredo's database, which spans the last 15 years of Brazil's legislative activities. To obtain the rough measure of affinity we computed legislator nominate scores for the year prior to our year of interest and then computed the absolute distances between all legislators and the executive. This yielded an affinity score measured on a scale between 0 and 2. Note that in 2002 the PT was not yet in government, so we used the position of the PT whip as the reference point instead. For 2003 we used the position of the government's leader in congress as the reference point.

Cabinet membership is coded as of March of each year since January and February are usually "dead" months, and March is when the legislative period begins. Data was obtained from Octavio Amorim Neto and complemented by the authors.

Budgetary data was obtained from databases provided by the Brazilian's Lower House *Consultoria de Orçamento e Fiscalização Financeira*, created from queries to the SIAFI, the official budgetary management system used by the Brazilian government.³⁰ From these databases we obtained both the share of the budget controlled by each ministry as well as the amendments presented by legislators. Legislators can present amendments to pre-existing projects (projects included in the budget draft by the executive) or create new projects for which no amount was reserved. In the former case, it is impossible to distinguish if the amount executed was from the legislator's amendment or not. Therefore, all pork figures used in this paper take into consideration only "pure amendments," or the execution of amendments that created new projects. The computation of "pure amendments" are only implemented for 2003 onwards, but we have made arrangements to have them extended backwards until 1995, and will probably be included in future versions of this paper.

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³⁰These yearly databases are available at <http://www.camara.gov.br/internet/orcament/principal/exibe.asp?idePai=2&cadeia=00>.

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