THE CONDITIONAL EFFECT OF PORK: THE STRATEGIC USE OF BUDGET ALLOCATION TO BUILD GOVERNMENT COALITIONS IN BRAZIL

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ABSTRACT

Open list proportional representation systems with districts of high magnitude, such as in Brazil, tend to produce legislators with different electoral constituencies configurations. Certain types of constituencies should be more electorally responsive to pork than others. For members for whom the electoral return to pork is high, we ought to see legislative votes sold for less. Thus, while presidential support should be increasing in pork allocation for all deputies, it should be increasing more for deputies for whom pork is the most electorally effective. In this paper I identify members who are likely to be the most advantaged by delivering pork by identifying how geographically concentrated their voters are. I show that legislators with concentrated constituencies tend to be more prone to vote with the president than deputies with scattered constituencies, when receiving same rates of pork. I build on original measurement of legislators' geographic constituencies, and collected a large set of data from Brazil during Lula's term (2003-2010) in order to assess my hypothesis.

PALAVRAS-CHAVE

RESUMO

SOBRE OS AUTORES

SUBMETIDO EM

APROVADO EM

1. INTRODUCTION

This paper investigates the effects of electoral rules on legislative behavior in Brazil. The current literature argues that presidents use pork to maintain or expand legislative majorities, assuming that the effect of pork is monotonic for every legislator (Pereira and Mueller, 2004; Raile et al., 2010; Zucco Jr. and Melo-Filho, 2009). Although I agree with the argument, I do not see any reason to believe that the effect of pork is universal across legislators. This paper, therefore, explores the nuances of the Brazilian electoral system to explain legislators' decision to support the presidential agenda in that country. My results show that deputies who receive the same portions of particularistic benefits express different behavior, even when controlling for their presence in the cabinet. The question that remains, then, is why?

My goal here is to investigate the determinants of legislative behavior exploring the interactions between the electoral institutions and pork appropriations in Brazil. Using a new data set of geographic electoral constituencies, I show that legislators with concentrated constituencies tend to provide greater legislative support for the presidential agenda when receiving pork appropriations, compared to deputies elected by scattered constituencies. I explain such variation by arguing that pork is more effective as a tool of `persuasion' when a deputy can extract clear electoral benefits from it, or in other words, when he can claim credit. Credit claiming is easier for deputies who have concentrated constituencies, thus the effect of pork on a deputy's propensity to support the president should be more prevalent among deputies with geographic electoral support. This should be true not only because concentrated benefits tend to appear more clearly in dense constituencies, but also because deputies with concentrated constituencies depend more on such resources to guarantee their electoral success.

Central to my argument is the understanding that the Brazilian electoral system produces legislators whose geographic distribution of votes varies considerably. The high magnitude of districts associated with open-list, and proportional representation electoral systems allows deputies' votes to be configured in ways that produce heterogeneous impacts on legislators' behaviors within the same districts. In other words, the pattern of the geographic distribution of votes conditions the association between the amount of pork received by a deputy and his legislative support for the presidential agenda. The legislators, therefore, vote with the president when they get the greatest `bang for their buck', meaning, when they receive resources that their constituencies covet most.

This paper intends to contribute to the literature on coalition building in presidential systems. Presidents in multiparty systems rarely enjoy single-party legislative majorities. (Shugart and Carey, 1992; Mainwaring and Shugart, 1997; Cheibub, 2002). Therefore, presidents must build majority coalitions if they want to enact the policy agenda

for which they were elected[1]. In such cases, presidents have to persuade various political players to join their governments, whether temporarily or permanently. The literature on coalition building describes this task as a process of negotiation that involves sharing both political power and material resources (Laver and Schofield, 1990; Laver and Shepsle, 1996; Amorim Neto, 2006). The main sources of capital at a president's disposal are money from the national budget and positions in the bureaucracy. Although recent studies have revealed important features of the executive-legislative relationship in multi-party settings, they fail to provide a complete explanation of the mechanisms through which legislators decide to trade votes for `material goods', especially in the Brazilian context.

Brazil's open-list proportional representation electoral system, with districts of high-magnitude, has led to the emergence of a multi-party system, characterized by minority presidents and legislators with heterogeneous constituencies. In such an institutional context, the relationship between members of congress and the president has been characterized by the exchange of portfolios and pork for support in the legislature (Alston and Mueller, 2005). The result is that since 1994 Brazilian presidents have received, on average, more than 50% of support in the congress, which means that most of their agendas have been approved by the legislators. What the extant literature has not realized yet is that there is variation in legislators' behavior, even when controlling for cabinet participation and pork appropriations. As I show in this paper, legislators' average support to the presidential agenda on the Congressional floor presents a variance of 46%, ranging from 0 to 99%. We still need to understand, then, why deputies have opted to support the president in exchange for resources such as portfolios, municipal transfers, budget amendments, and other appropriations?

This paper proceeds as follows. The next section presents the main features of the Brazilian political system in order to highlight their implications for the relationship between the president and the legislature. I then discuss the literature about coalition formation in presidential multi-party settings, highlighting the limits of the literature in evaluating legislative behavior in Brazil, and exploring the puzzles that motivate this investigation. The following section presents data and methods. The final section interprets the findings and discusses some of their implications.

2. BRAZILIAN POLITICS

2.1 ELECTORAL SYSTEM

Brazil is a federation composed of 26 states. The population of each state is represented proportionally in the Chamber of Deputies. There are 513 seats distributed among the states, which are multi-member districts with magnitudes varying from 8 to 70. De-

1 Even when presidents can use decree power they need to deal with majority problems (Shugart and Carey, 1992).

puties are elected by an open-list proportional representation (OLPR) system. Governors and the president are elected by a majority-runoff rule. These features have two important implications. First, OLPR leads to intra-party competition among prospective deputies. Such competition, besides producing weak electoral parties, leads to "dependency" among elected deputies. While some obtain substantial proportions of votes, others are simply elected on their more popular colleagues' coattails.

Second, because states with high magnitudes are the districts for legislative elections, the threshold for victory is not very high, and there is ample room for candidates to try different tactics to build electoral constituencies inside each district. Because of this arrangement, it has been argued that deputies would not be able to identify their constituents (Santos, 2003). Carvalho (2003), among others, showed that this is not true, especially if we take into account geographic representation. Deputies know where their votes come from, and they intend to deliver benefits for them as much as possible[2]. Each legislator has an informal district inside the state from which they derive their votes. And there are several different ways in which the electoral constituencies of deputies can be set up. It is also plausible to claim that voters identify and chose their representatives locally. As Shugart et al. (2005) and Renno (2009) have shown, in OLPR the geography and the local experience are important sources for voters' choices. Mainly in complex electoral contexts (Sniderman, 2000), like the Brazilian one, the choice of representatives is driven by local cognitive cues, and local experience with politicians well-known in geographic areas.

This geographical distinction was first observed by Ames (2001). After mapping the votes of each candidate, he discovered that four kinds of constituencies could be observed within Brazil's formal districts: concentrated/dominated, concentrated/fragmented, scattered/dominated, and scattered/fragmented. In the concentrated/dominated case, a deputy receives votes only in one small region, where he also achieves a substantial majority of the votes. In the scattered/fragmented case the deputy receives votes from different municipalities, but he does not have a majority of votes in any of them. The others are mixed cases. Based on this classification, Ames (2001) argued that deputies with different constituencies should have different preferences and should adopt different strategies inside the legislature. This argument helps to shed light on a puzzle that has been investigated for almost 15 years by Brazilian scholars: how do presidents obtain

legislative support? By focusing on the concentration/dispersion dichotomy I can explain why pork has been an efficient resource to buy legislative support from some deputies, but not all.

2 Surveys with deputies in Brazil have shown such patterns very clearly. See for example, Castro et al. (2009).

2.2 POLICY, OFFICE AND PORK

Contrary to what Linz (1994), Mainwaring (1993) and others predicted, government coalitions under presidentialism do not collapse more easily than do parliamentary coalitions (Cheibub et al., 2004). Consequently, breakdowns are not more frequent in presidentialism than in parliamentarism (Limongi, 2004). This derives from the strategic use of resources by presidents in order to guarantee legislative support. In response to the first wave of works that criticized the explosive combination of presidentialism with multiparty systems, two separate approaches have been developed.

The first - roughly echoing parliamentary theories - has emphasized that coalition goods, such as positions in the government coalition and cabinet, are strategic resources available to presidents (Martínez-Gallardo, 2005). This approach has examined how executives construct coalitions and cabinets in ways that maximize legislative support. In brief, executives are more successful in obtaining support when their cabinets minimize the presence of nonpartisan ministers and distribute cabinet positions proportionally among coalition members (Amorim Neto, 2002; Negretto, 2006). Executives may also redesign the internal structure of the presidency itself, using staffing and organizational reforms in ways that resemble the allocation of ministerial posts (Inácio, 2006).

A second approach recognizes that the success of multiparty presidentialism largely depends on what happens to the ordinary bargains during the executive's constitutional term of office. The executive uses particularistic benefits on an ongoing basis to overcome ideological resistance in generating legislative support. The authors claim that pork is exchanged for votes in multiparty presidential systems like Brazil as they need to provide local benefits to their constituencies in order to be reelected (Ames, 2001; Pereira and Mueller, 2004; Alston and Mueller, 2005; Auston et al., 2008). As legislators are well aware, this access to budgetary resources increases their likelihood of political survival (Ames, 1987; Samuels, 2002; Pereira and Renno, 2003)This is a contingent approach which stresses the formation of ad hoc coalitions on the legislative floor.

In an attempt to integrate these two ideas, Zucco Jr. and Melo-Filho (2009) argue that presidents negotiate with parties when they need to build majority coalitions, but bargain with individual legislators when they need to complement those majorities. Consistent with this argument, Raile et al. (2010) propose that the two presidential "tools" - pork and coalition goods - work as imperfect substitutes. Coalition goods establish an exchange baseline, while pork covers the ongoing costs of operation.

While the literature has presented consistent results showing that pork is efficient because deputies need to provide local benefits to their constituencies in order to be reelected, scholars have not yet considered how constituency type might affect the provision of pork for a given legislator. For instance, poor constituencies tend to be satisfied with small investments, concentrated constituencies tend to realize the provision more easily, and urban areas tend to spread news about ownership faster. If those statements were true, we should expect them to exert a conditional effect on pork.

3. CREDIT CLAIMING AND CONCENTRATED CONSTITUENCIES

Legislators' behaviors are not constant across or within parties. Why might deputies from the same party, and who receive the same amount of pork, exhibit different behavior in terms of their support for the executive? Do they respond better when receiving one kind of resource rather than another? If joining the cabinet were the solution to make parties more supportive of the presidential agenda, then parties that received equivalent numbers of portfolios should, on average, increase support of the president at equal rates. In addition, if receiving pork were the answer to make deputies vote with the president, then legislators who received the same amount of pork should increase their presidential support, on average, at the same level. Contrary to what we would expect, however, this simple reasoning is not generally observed when we explore data about the Brazilian Executive-Legislative relationship during President Lula's administration from 2003 to 2010.

Figure 1

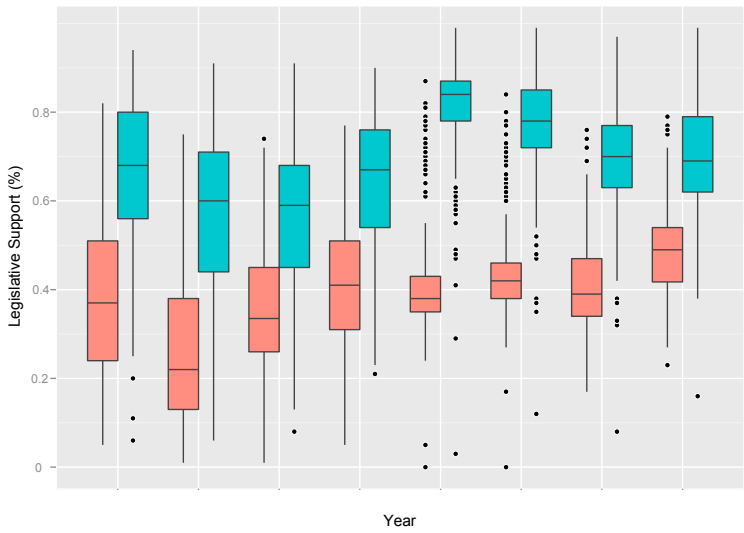


Figure 1 shows the average legislative support received by President Lula during his two terms by comparing the deputies whose parties were represented in the cabinet that year, with those whose parties were not in the cabinet. The legislative support vari-

able ranges between 0 (no support) and 1 (support every time)[3]. As can be seen, legislators from the government, on average, tend to vote more with the president than do those from the opposition, although there is considerable variation within each group for every year (standard deviation for the period is 0.14). These numbers are relevant not only because the variation of behavior inside each group is large for all years, but also because there is an overlap of both distributions in every year of Lula's first term (2003-2006), indicating that such a comparison needs to be improved in order to better distinguish the incentives for supportive and non-supportive legislators.

Figure 2

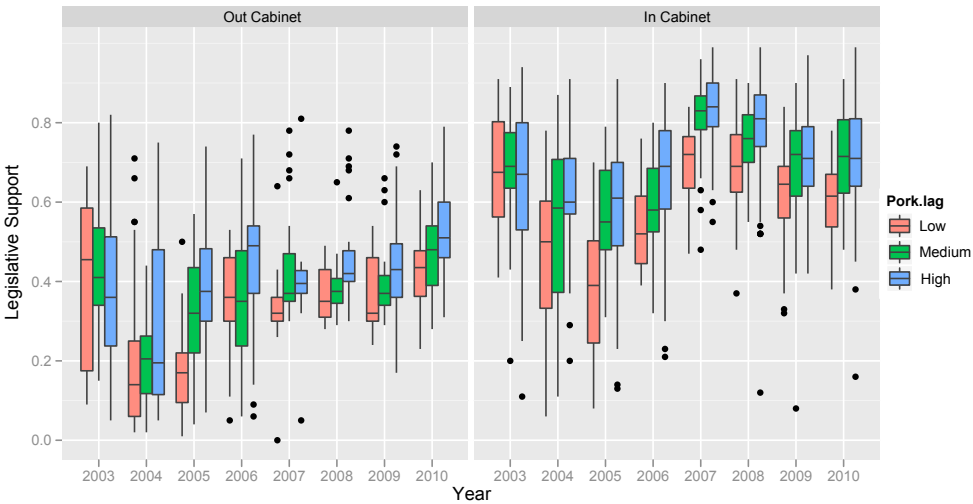


Figure 2 shows that the amount of pork received by each legislator increases the average legislative support for the president. However, there is considerable variation among deputies receiving the same amount of pork. Although more pork tends to be associated with more support (the exception is 2003 for those out of the cabinet), this effect is not the same across years and between those whose parties are in or out of the cabinet. It is important to highlight that such variation is expected in the comparison between in cabinet and out-of-cabinet, but not within each category. Based on the current literature, pork is used to complement majorities, but the literature assumes that the effect of pork is universal. What we are observing here, however, is that deputies that receive the same portion of particularistic benefits express different behavior, even controlling for presence in cabinet. Why?

3 To prevent underestimation of the coefficients, and to make sure that I am capturing the correct measurement of legislative support, I exclusively analyze the roll-call votes that showed some kind of conflict. Following prior initiatives (Amorim Neto et al., 2003; Figueiredo and Limongi, 1999; Limongi, 2006), I included in the data set only the roll-calls which received less than 80\% of votes of the floor.

This is a question that has not yet been asked and, obviously, for which there is no current answer in the literature. There are two possible theoretical hypotheses that could be identified about that. The first is that deputies disagree about the policies defended by the president, and they are not convinced to vote with him independent of pork offers. The second possible explanation is that members of congress have different expectations about their relationship with the president vis-a-vis their constituencies' preferences. In what regards the first possible answer, because deputies represent different interest groups, they face individual conflicts between voting with the president or voting with their constituencies' interests. In some situations, they are more prone to vote with the president, while in others they prefer to abstain or vote against the president. This first hypothesis is plausible, but needs a special kind of research design to be tested. It would be necessary to identify the preferences of each deputy's constituency to check when and how deputies make this strategic choice[4].

The second possible hypothesis is the one taken up in this paper. Based on Mayhew's (1974) arguments, I explore how the potential for credit claiming determines the effect that pork has over legislative support. Instead of expecting a monotonic relationship between pork delivery and presidential support, I propose that this relationship depends on the kind of constituency that a deputy has. As concentrated constituencies increase the likelihood for the credit claiming of pork-barrel spending, deputies with concentrated constituencies should reward a president's appropriations with higher levels of legislative support. On the other hand, a deputy with a scattered constituency should have a harder time credibly claiming credit for the appropriation of pork somewhere in his state, such a deputy will be less prone to engage in exchanges of pork for policy.

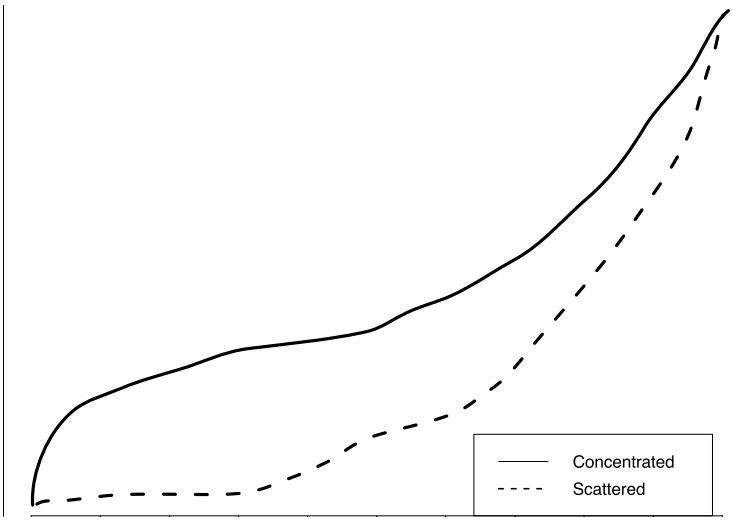
The above claim is based on a few assumptions. First, I assume that legislators are office-seekers who want to win elections to implement policies, and provide local benefits for their constituencies (Aldrich, 1995). Second, they are risk averse, meaning that they want to reduce as much as possible the chances of dissatisfying their voters. Third, presidents are assumed to be cost-minimizers, meaning they will seek to form majoritarian coalitions using the minimum amount of resources. Finally, they are rational players that try to anticipate their partners' preferences in order to negotiate more effectively.

In this context, the success of the relationship between deputies and the president is determined by the identification of deputies' preferences. When a president is able to identify and provide the type of resource that is most useful for a deputy - in terms of increasing his likelihood of winning elections - he is able to buy the deputy's support more efficiently. For the Brazilian case, the geographical distribution of deputies' constituencies could be used to identify how much deputies value pork. The fact

4 In another project I am using survey data to assess that statement. I asked each deputy what they do when they face a bill that creates conflict between his constituencies' preferences and the government's interests. As the literature would expect, Brazilian deputies tend to vote with the president when this kind of conflict emerges. Another possible measurement solution would be to use constituencies' characteristics to estimate their preferences. These are plans for future projects.

that votes come either from concentrated, or scattered areas influences deputies' chances to convince their electorate about the provision of a local benefit. I claim here, thus, that legislators with concentrated constituencies are more likely to convince their voters about the apportionment of some pork, than legislators with scattered constituencies. This does not mean that one constituency is more attentive than other, but that is harder to prove to a scattered constituency that the provision of a local benefit deserves broader electoral support. Such a claim has empirical support from the cognitive studies of voters in OLPR systems. Shugart et al. (2005) and Renno (2009) show that geographical cues are very influential on the determinacy of the voters choices. When a politician develops a regional "brand name" for himself, he has a higher probability to be chosen by a voter in a legislative election. I represent this claim in the Figure 3 below.

Figure 3



Based on these arguments, therefore, I expect that the higher the level of concentration of a deputy's votes, the higher the marginal effect of pork on the deputy's support of the president's legislative agenda. This is the main empirical implication derived from the theoretical arguments presented here. But, it also implies that a president who distributes pork for deputies equally, is inefficient. To avoid wasting resources, the president should instead buy the cheapest majority that combines legislators with concentrated and scattered constituencies.

As deputies might have constituencies with different geographical distributions, I expect that the president will develop different strategies to negotiate with each kind of legislator, given the number of votes the president needs, and the proportion of legislators with each constituency type that are present in the floor. This is another important implication of my theoretical claim. I expect that the constituency type, and the available number of legislators of each type, will determine the global strategy of the president. If he had a majority of concentrated legislators on the floor, then he should buy only them. Otherwise, he should pick the strategy that guarantees the success of his agenda with the lowest possible cost. Such an implication will be tested in the second part of this paper.

Figure 4

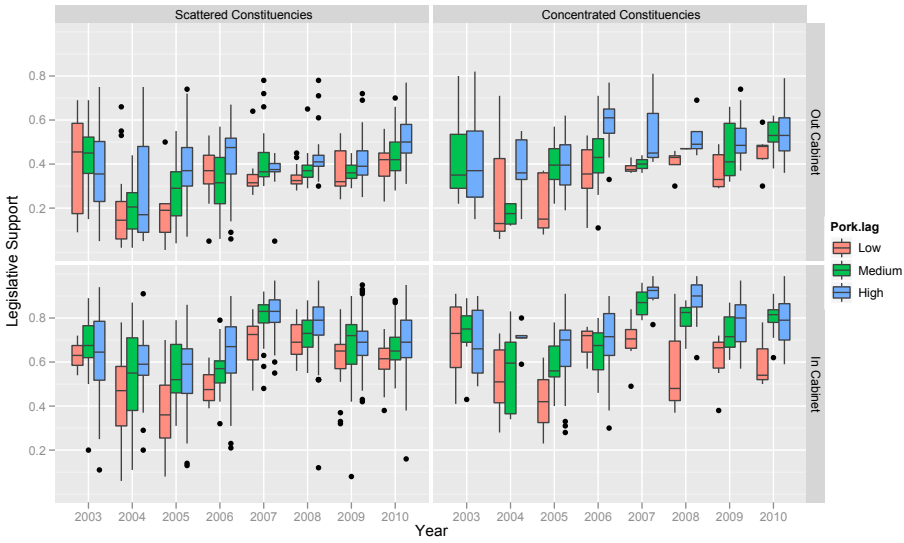


Figure 4 shows the legislative support of deputies controlling for cabinet, pork and constituency type. As we can see, the difference in legislative support among the levels of pork is higher for deputies with concentrated constituencies; this is especially true for those whose parties are members of the cabinet. Note that in the right column of Figure 4 – which includes only legislators with concentrated constituencies – deputies who received high levels of pork tend to give, on average, much more legislative support than do deputies who received low levels of pork. This is not true for deputies in the left column of the Figure 4. In this case, the difference of legislative support of legislators who received high and low amounts of pork is not significant. The general effect produced by pork seems to have decreased among deputies with scattered electoral support. This simple descriptive analysis shows some evidence that constituency type plays a role in

determining the relationship between deputies and the president.

To explore this argument I include an interaction term for pork and constituency in the model, which has been tested for almost 15 years in the literature about the Brazilian Executive-Legislative relationship. While legislative support is explained by the presence of parties in the cabinet, the ideological distance of the presidential party and the other parties, the amount of pork appropriated by the president, and the cartelization of power inside the congress, we do not yet have any mention of the interactive role that constituency type could have in the distribution of pork. In the next section I describe a novel measurement of constituency type, given that the measurement of informal constituencies in multi-member district systems is currently obscure. I also provide a description of the variables to be used in the analysis that follows, in Section 5.

4. DATA AND VARIABLES USED

4.1 DATA SET

The testable implication of my argument is that the marginal effect of pork on legislative support increases as the concentration of votes in a given deputy's constituency intensifies. I test my claim using data from Brazil during Lula's presidency (2003-2010), which spans two legislatures, the 52nd and 53rd.

My units of analysis are the national deputies for each year, so my cross-section panel data contain 3,080 cases. However, missing data on pork expenditures reduce that number by roughly two thirds. This happens because deputies ask for pork one year before they receive it. Thus, those legislators who were not in the legislature prior to the start of Lula's term cannot have received pork in the first year of his term. Also, those legislators who were not in the chamber for the 2003-06 legislature cannot have received pork at the start of the next legislature[5].

4.2 LEGISLATIVE SUPPORT

Support, the dependent variable, is the frequency with which an individual legislator votes with the president, only for conflicted roll-calls. The variable ranges from 0 to 1. In Brazil, the government manifests its preferences in each roll-call vote through the president's "whip" Lider do Governo na Camara). The "whip" is a deputy chosen by the president to work as a leader on decisions concerning the president's interests. This strategic position helps to solve the collective action problem of coalition behavior, and helps the researcher identify the preference of the executive in the legislative process. Thus,

5 This also happens because of absences in the floor. This kind of event happens regularly but increases in election years - 2004, 2006, 2008 and 2010. I also identified missing cases because some legislators do not request pork for their districts, but prefer to spend their quota with the party, the backbencher, or some commission.

consistently with the literature on this subject, I measure how frequently each deputy votes with the whip (Amorim Neto et al., 2003; Figueiredo and Limongi, 1999; Limongi, 2006; Zucco Jr., 2009; Pereira and Renno, 2003).

I use Support as a dependent variable in order to evaluate whether or not the Brazilian president can convince deputies to vote for his agenda. But I am not analyzing only the projects that the executive sent to the legislature. I investigate the behavior of the deputies in every roll call in which the whip manifests the government preference. Such a choice is reasonable if we consider, as I do, that in presidential systems under coalition governments, the agenda is formatted not only by the president, but also by his partners in office and by party leaders in the legislature, who can also present demands to the floor[6]. The description of variables by year is provided in the Figure1.

4.3 PORK

Brazilian legislators can propose a fixed number of individual amendments, which can add up to a previously determined ceiling, and include mostly infrastructure projects that benefit their constituencies. Since the budget law only authorizes expenditures, and the government is not obliged to actually spend the budgeted resources, presidents can choose which amendments to carry out. Since I assume that legislators want their amendments to be implemented, selective use of the executive impounding power is an important tool to help secure support and to discipline members of congress (Pereira and Mueller, 2004).

The amount of pork received by individual legislators (Pork) is operationalized as the legislator's success in getting his budget amendments implemented (or appropriated) by the government. This variable ranges from 0 to 1, representing the percentage of a legislator's proposed amendments that are executed. Some papers using similar data call attention to an endogeneity problem when one is trying to explain the effect of pork on support. Pork is handed out throughout the year, even though considerable amounts are disbursed in December - the end of the fiscal year. Pereira and Mueller (2004) show that pork disbursements can be both a reward and an enticement for legislators, and for this reason they affect and are affected by the legislator's voting record. Here, it does not matter whether the deputy is bought before the vote or rewarded afterward because I want to investigate the association between annual pork disbursement and annual legislative support rate. To guarantee that my results are trustworthy, I test my hypothesis using Pork and Pork.lag, which are the same measurements, but the latter is associated with support one year before.

Such data is only available for legislators who were serving in congress in the fiscal year preceding the appropriation. It is worth noting that Lyne (2008) uses a similar stra-

6 To avoid the possibility that my results have been driven by such a decision, I also ran my model using only roll-calls votes where the author is the president. The results are not different at all.

tegy. Many scholars using the same data preferred to run a two-stage least squares model using age and seniority as instruments for pork (Pereira and Mueller, 2004; Zucco Jr. and Melo-Filho, 2009). I do not believe, however, that such a strategy is the best approach, as they do not have reasonable instrumental variables. Seniority, for example, does not affect support only through pork. Instead, it has an indirect effect through cabinet membership as well as through constituency type.

The most significant limitation of this data is its ability to capture how much of the total amendment has been executed by the president given the amount requested by the deputy. The critical problem is that deputies can use their amendments to top up some prior budget indications. For example, say the government wants to spend 2,000,000 dollars in the construction of a hospital. A deputy can add any amount to increase such investment, for instance, an additional 2,000,000 dollars from his 6,000,000 dollar--budget. In the end, the information that we have is that the government spent, as an illustration, 2,000,000; and it is impossible to know if such amount was spent attending to the legislator's interests, the president's interests or both. As this kind of situation happens a lot, it is common practice to use only the so-called "pure amendments" - budgetary amendments that were clearly initiatives of the deputy. By doing this, we lose important information about pork, but this is the best empirical solution so far (Pereira and Renno, 2003; Zucco Jr., 2009).

4.4 CABINET

Party membership in the cabinet is operationalized as a dummy variable (Cabinet), indicating whether the legislator's party was in the cabinet in the specific year (1) or not (0). I consider parties in government only if they are formal members of the coalition. That is, I do not count parties that informally support or abstain on key votes. This decision makes sense given that the dependent variable is the support each deputy gives to the government, and could not also be included in the right-hand side of the regression equation. Cabinet membership was observed at the beginning of each legislative session (February of each year). The relatively few cases of parties changing cabinet affiliation during the year were ignored because such changes were more significant between the end and the beginning of each year. In the period analyzed here, the most significant changes in the governing coalition were the addition of PMDB and the departure of PDT and PPS during Lula's first term.

4.5 GEOGRAPHIC CONSTITUENCY

My key independent variable is the interaction between Pork and Constituency. The pork measurement is already known in the literature about Brazil and used in several papers (Ames, 2001; Pereira and Mueller, 2004; Raile et al., 2010). Constituency, however, was created for this specific work and needs to be described carefully. In general, the

literature has found that there are two kinds of geographical constituencies or "informal constituencies" in Brazilian districts: the concentrated ones, and the scattered ones (Ames, 2001). Although this dimension has been used in several papers about electoral connection in Brazil, its measurement is obscure. Thus far, there is very little systematic care in the explanation of the measurement of geographic constituencies; completely different configurations often show very similar results. My study aims to fulfill this gap by clarifying the measurement of this variable.

The first work that suggested the use of maps to measure constituencies in Brazil was (Ames, 2001). In his book, Ames argues that "Moran's I" measurement of spatial autocorrelation could be used in order to see how dispersed or concentrated the supporters of legislators in Brazil are. This measurement captures whether the spatial distribution of the data is random or follows a specific pattern - a conglomeration, for example (Anselin, 1995). The measurement goes from -1 (strong and negative autocorrelation) to 1 (strong and positive autocorrelation).

The literature in this field has produced other measurements that would seem more appropriate for this kind of study. The Gi* measures the agglomeration of similar values around a specific point in space, given a distance previously specified (Anselin, 1995). Those places are called hot spots, and specify the concentration of similar values in the map. The implementation of this technique is found in GeoDa (a freeware software) by the label of LISA's spatial regression. A good implementation of such technique in political science data was pursued by Shin and Agnew (2007). The authors used a spatial analysis to examine the geographical pattern of support for the fading and rising parties in Italy between 1987 and 2001. They have shown how the old Italian parties were replaced geographically by the new ones in each region of the country.

I investigated both LISA and Moran's I measurements to classify the different kinds of informal constituencies for each deputy in Brazil; the results, however, were inconsistent. The calculation of the autocorrelation misrepresents the spread of data due to the matrix of weights necessary to calculate it. Specifically, such spatial measurements are unable to identify concentrations of points when only one point in the area has all the information. For example, a deputy who receives 90% of his votes in one municipality A, and the other 10\% in cities far from A, is classified by Moran's I as a scattered constituency.

As my target is to identify whether the votes of a deputy are concentrated in a single region or municipality, or spread in more than one part of the state, I decided to use a Herfindahl measurement to calculate how much a deputy depends on the votes of one municipality. In other words, I calculate the 'competition of municipalities' to give electoral support for a candidate. This index not only allows me to compare the constituencies across candidates, but also provides me a continuous measurement of the composition of their votes. The Geographic Constituency Index (GCI), as I call it, ranges from 0 to 1. As the index approximates zero, electoral support is increasingly dispersed and as it appro-

aches one, electoral support is increasingly concentrated[7].

I use the proportion of votes in each municipality in order to guarantee that each municipality has the same weight for each candidate, and also to guarantee comparison. I do not consider the size of the municipality, but only the proportion of votes received there by each candidate. I recognize that there is a limit in using the data in this way since credit claiming in big cities may be different from small cities. I did not find a definitive solution for this potential problem within my measurement, as the alternative of using the number of votes will always produce bias in the indicator. I used an ad hoc solution, though, whereby I included in my regressions a control variable with the population size of the municipality from where the legislator received more votes. Other limits of my measurement are given by the failure to capture the closeness of the votes in every municipality. Although this could produce more scattered constituencies, it does not affect the degree of dependency of deputies on municipalities. Thus, instead of measuring the cluster of votes in regions, I am capturing the electoral dependency of a legislator in one or few municipalities.

GCI illustrates (1) how many votes there are in each municipality, and (2) how dispersed they are. With this measurement I find that in Brazil there are more deputies with scattered constituencies than with concentrated ones. In this way, I partially replicate Ames' results. Comparisons with Ames' and other strategies to produce such a measurement, demonstrates that the Herfindahl measurement is the best choice available. Besides the gains in terms of transparency of the measurement, such index takes into account the relative importance that each municipality has over the amount of votes for each deputy. Though that is not the aim of this paper, it is important to highlight that the correlation between GCI and Moran's I was .40, and between GCI and cartogram classification was .56.

4.6 CONTROLS

I also control for alternative hypotheses. The variable Ideology is discrete and classifies each deputy according to his party's ideological position. My aim in controlling for ideology is to show that it is not the similarity of preferences that drives the results observed. Ideology varies from 1 (extreme left) to 5 (extreme right), with 3 meaning centrist. This variable was created using results of previous research on deputies, party leaders and voters in Brazil. In general, prior studies indicate a homogeneous classification of the relevant parties along the ideological spectrum. (Zucco Jr., 2009; Power and Zucco Jr., 2009; Melo and Nunes, 2009). The final classification of the political parties positions was from left to right: PSTU, PSOL, PCdoD, PT, PSB, PDT, PV, PPS, PMDB, PHS, PMN, PSC, PSDB, PTB, PL/PR, PRONA, PFL/DEM and PP.

7 Formally, the Geographical Concentration Index (GCI) is defined as the sum of the squares of the proportion of votes (p) that a deputy had in each municipality: $GCI = \sum_{i=1}^{N} p^{2}_{i}$

I also control for the alternative hypothesis of social and economic conditions of constituencies. I would expect that poor constituencies are more dependent upon pork. To avoid such a confounding effect, I create a continuous variable with the percentage of poverty observed in each year in each deputy's constituency (Poverty). As GCI is a variable created based upon information for multiple municipalities, I use the poverty percentage for the municipality in which each deputy received the most votes. The Northeast cities are those, on average, with more poverty and less growth, while in the South poverty levels are lower.

Budget is another control used in one of the models. It is a continuous variable of the budget for investments for each of the years investigated here. I use it as a proxy to determine how much pork was available to be distributed by the president in each year. This variable also captures variation of pork available in regards to the economic conditions of the country by year. I would expect that lower amounts of pork restrict the president's ability to use his complete set of strategies. More importantly, the effect of pork in such situations could decrease considerably.

As I propose a new measurement of constituency type, this method could produce some oddities that might have substantive consequences. The first has to do with how concentration interacts with an open-list system. Concentration has to be measured using the preference votes for individual deputies, but some deputies are elected with very few preferences votes because they are on the list of someone else who got a lot of votes. As there are some cases like this in my sample, especially in São Paulo, they might be more motivated to ally with the president due to extreme electoral insecurity rather than an ability to claim credit. To avoid that alternative hypothesis, I set two controls that measure different aspects of electoral insecurity: the position of the legislator in the list (List), and the number of votes that each deputy received in each election (Votes).

Finally, I estimate the models using a dummy for Term to differentiate between Lula's first and second terms. Although he was reelected, Lula formed different cabinets in each term. I also control for the population size of each constituency. I hope to avoid alternative hypotheses associated with the number of votes necessary to be elected and the legislator's propensity to claim credit in large/small constituencies.

4.7 ESTIMATION ISSUES

Several remaining problems could still hinder the analysis. The first is the amount of missing data. Almost 10% of the values in the main dependent variable (Support) are missing, and 33% are missing in Pork. In all, I have more missing than observed values for 2007 and 2008. The main problem with Pork is the low rate of reelection in Brazilian legislatures. Almost 50% of deputies in Brazil are not reelected for the next term, either because they did not run for the same position or because they ran but lost (Samuels, 2003). As noted above, such legislators are not available to order pork in the previous

year when they were not yet in the legislature. Pork.lag excludes legislators who were not present in the floor one year before. That is critical for 2007, as I lost a huge number of deputies who were not reelected in 2006. Second, but still associated with the previous issue, there is some reason to suspect that the selection mechanism at work might not be random. Some previous studies have shown that amendments actually increase deputies' chances of reelection (Pereira and Renno, 2003). Therefore, we would expect that those not reelected were the same who did not have success in getting pork from the president, and thus, those who did not support him before.

As I do not have a way to solve this potential problem, I examined my data for any pattern of ``missingness" that could make me believe that it is endogenous to receiving pork in the past. I did not find any clear pattern, though I observed that 43\% of the deputies not reelected were elected for other positions, such as mayor or state deputy. Thus, most of them are showing electoral success for other offices, which indicates that it is not the pork success rate that is driving my selection mechanism. Moreover, corruption was a central theme of the Brazilian 2006 election, both at the executive and legislative levels. According to Renno (2008), more than 100 Federal deputies, or 1 in 5 in the 52nd Legislature (2003-2006) were mentioned by the media in relation to some scandal - its impact on reelection was huge. Thus, the association with scandal, the decision to not run for reelection, and the huge negative effect that scandal had on reelection prospects, has nothing to do with the causal relationship that I try to explain here. In sum, while Pork certainly must affect the probability of reelection, the actuality of reelection or failure is affected by so many other things that there is probably not a concerning bias in the data-missingness.

Given these issues, I test my argument using three different data sets. The first, which I call ``pooled sample," includes all the legislators between 2004 and 2010 for whom we have information. In the second scenario, instead of testing my argument using every legislator present in the chamber at least once, I created a data set including only deputies who were in office for the entire period (from 2003 to 2010). I refer to this data set as the ``full-time sample." For the third data set, ``imputed sample," I replaced empty cells by imputed values using the Amelia II procedure (King et al., 2001). I now turn to the results.

5. RESULTS

The basic model around which the analysis is built can be conceptually summarized as below.

SUPPORT = \alpha + \beta_{1}(CABINET) + \beta_{2}(PORK) + \beta_{3} (IDEOLOGY) + \beta_{4} (CONSTITU) \\

+ \beta_{5} (POVERTY) + \beta_{6} (BUDGET) + \beta_{7} (TERM) + \beta_ {8} (VOTES) + \beta_{9} (LIST) \\

+ \beta_{10} (POPULATION) + \beta_{11} (CABINET \times IDEOLOGY) \\

+ \beta_{12} (CONSTITU \times PORK.lag) + \beta_{13} (POVERTY \times PORK.lag)

Following work done on executive-legislative relations in Latin America in general, and in Brazil in particular, I distinguish the provision of pork to individual legislators through the selective appropriation of funds (Ames, 2001; Pereira and Mueller, 2004), from the allocation of control over parts of government to parties through the appointment of cabinet members (Amorim Neto, 2006; Amorim Neto et al., 2003; Geddes, 1994). I employ an interaction term to assess my main argument: deputies with different constituencies respond differently to pork provided by the president.

5.1 PANEL DATA AND YEAR FIXED EFFECTS MODEL

The first set of results appears in Table 1, where a year fixed effect linear model is fitted in three different data sets. My analysis will focus on the results of the "pooled" data set (a panel data containing all the legislators who were on the floor at least once). The other two datasets used, as I said before, are the "Full-time" and "Imputed" samples, respectively. If the missing data were not causing bias in my estimates, I would expect similar results independent of the dataset used. To assess the endogeneity problem and investigate the effect of pork, I test models with pork or pork.lag. This strategy will also allow me to investigate if pork has a time effect. If pork.lag shows some effect, I would suspect that the president and legislators make deals that take a long time to expire. I fit different linear models using OLS and robust regression analysis using an M estimator. Robust estimation is commonly used when the data contain outliers. In the presence of outliers, least squares estimation is inefficient and can be biased. Because the least squares predictions are dragged towards the outliers, and because the variance of the estimates is artificially inflated, the result is that outliers can be masked. As the results were very similar I report only the OLS findings.

TABLE 1

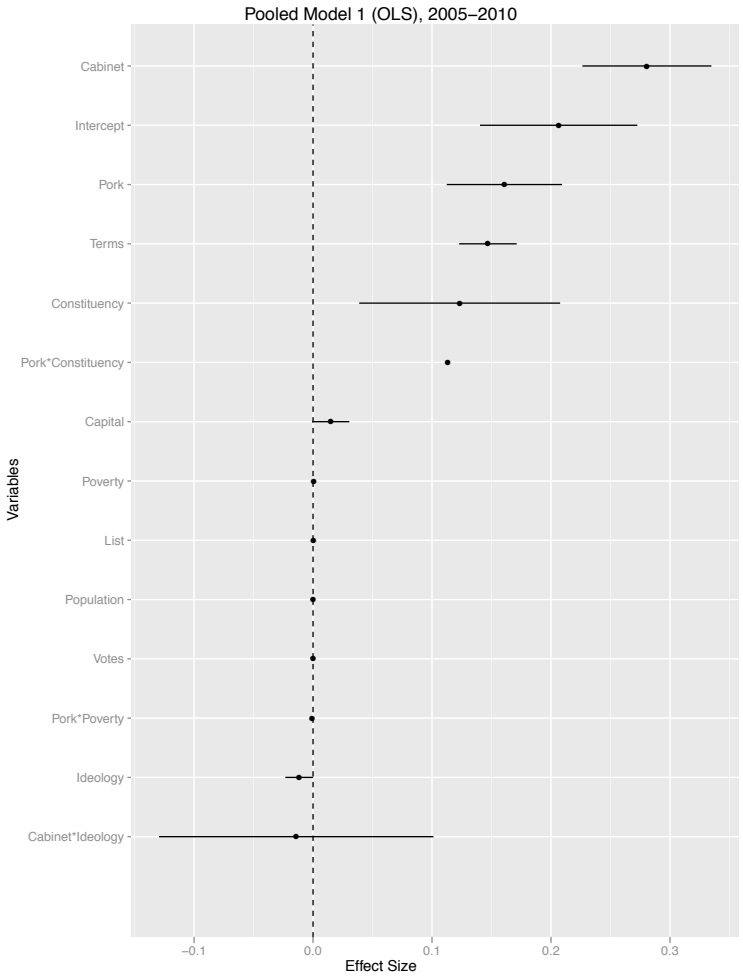
	Pooled 1	Full-time 1	Imputed 1
(Intercept)	0.44 *	15.37 *	13.27 *
	(0.05)	(1.91)	(0.92)
Cabinet	0.28 *	0.21 *	0.19 *
	(0.03)	(0.04)	(0.02)
Ideology	-0.02 *	-0.03 *	-0.04 *
	(0.01)	(0.01)	(0.00)
Pork	0.07 *	0.06 *	0.08 *
	(0.02)	(0.03)	(0.02)
Constituency	0.13 *	0.10	0.07 *
	(0.04)	(0.06)	(0.02)
Poverty	0.00	0.00	0.00 *
	(0.00)	(0.00)	(0.00)
Budget	-0.00 *	-0.00 *	-0.00 *
	(0.00)	(0.00)	(0.00)
Term	0.22 *	2.04 *	1.78 *
	(0.01)	(0.24)	(0.12)
Votes	-0.00 *	-0.00	-0.00 *
	(0.00)	(0.00)	(0.00)
List	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)
Population	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)
Capital	0.01	0.01	0.00
	(0.01)	(0.01)	(0.01)
Incab × Ideology	-0.01	0.01	0.01 *
	(0.01)	(0.01)	(0.00)
Pork × Constituency	0.06	0.13	0.05
	(0.05)	(0.08)	(0.03)
Pork × Poverty	-0.00	-0.00	-0.00 *
	(0.00)	(0.00)	(0.00)
N	2158	1134	4272
adj. $R2$	0.59	0.58	0.58
Resid. sd	0.14	0.14	0.14

Standard errors in parentheses

In broad terms, the main components of the model (Cabinet, Pork, Ideology, and GCI) explain a considerable portion of the variation in the dependent variable. Each of

these variables exhibits the expected effects: Greater success in obtaining pork and the parties' presence in the cabinet are associated with more support for the president. Greater ideological distance between president and deputies is associated with less support for the government agenda. Finally, the greater the concentration of a deputy's constituency, the higher the legislative support given to the president. Budget, Votes, List, Population and Poverty, however, do not seem to have an effect when they are set as control variables, and Term further supports the evidence already explored in the second section of this paper: Lula gained more legislative support during his second term. There is a notable difference in the results when using Pork vs. Pork.lag. When the lagged variable is included in the model, the effect of pork seems to be amplified. Indeed, the size of the coefficients for pork.lag are twice that of the regular pork variable. This seems to support the idea that negotiations using pork have a time-frame effect.

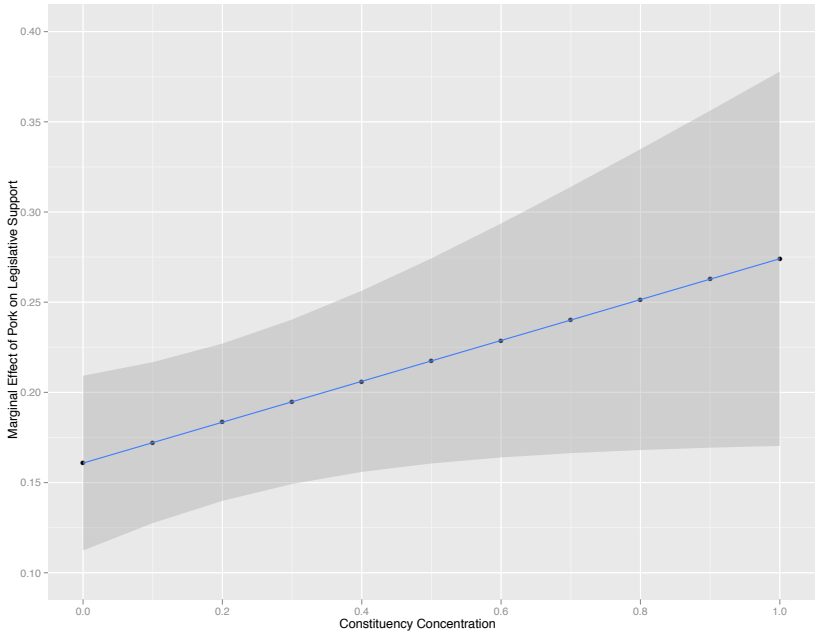
Figure 5



As we can see in the Figure 5, all estimators exhibit the expected effects and the confidence intervals confirm my main expectation, although not all seem to have a strong effect on Support. The intercept tells us the predicted level of legislative support for the president on average considering all the controls included in the model. Thus, the average legislator tends to vote with the president around 20% of the time. This is surprisingly low, but shows how well the controls are set to disentangle effects. The strongest predictor of legislative support is belonging to the president's coalition. The coefficient of roughly 0.28 and standard error of 0.03 implies that legislators who participated in Lula's formal coalition tended to vote with him around 25% to 32% more than those whose parties were not in the cabinet (these are at the 95% confidence interval). This is a high quantity, considering the number of votes that the president needs in order to pass bills (almost 215/513 votes), and the effective number of parties inside the legislature (almost 4/17). Moreover, the uncertainty around the estimation is relatively low, as the confidence interval segments show. It is also interesting to observe that pork and constituency still show statistically significant effects, even when the interactions are included. That means pork and constituency have an overall effect that could not be eliminated even when controlling for their interaction. The first impression could be that the interaction made no difference. I disagree on this interpretation, however, as the step-by-step regression in which I included each of these variables one after the other support my claim. It shows that the inclusion of the interactive term constituency*pork produces a significant reduction in the coefficient of pork.

Most of the results presented so far were already known for Cardoso's terms, and they seem to be similar to Lula's terms too. As I would like to pursue more than a replication, I will draw attention to two striking features that emerge from the regressions, which correspond to the main issues analyzed in this paper. First, the marginal effect of pork over support is greater for deputies with concentrated constituencies. Second, this marginal effect appears to be conditional on time. As both of these results involve the interpretation of interaction terms, they are much better observed graphically (see Figures 6 and 7).

Figure 6



Through this graphical representation of the marginal effect of pork over legislative support, given different levels of constituency concentration, we see that pork exerts a greater effect on the behavior of deputies with concentrated constituencies than it does on those with scattered constituencies. This is reflected by the positive coefficients on the interaction between Pork and Constituency in every model presented thus far. This interaction term implies that pork has a greater effect on the behavior of legislators that have concentrated geographic constituencies (6%), although the net effect of pork is still considerable (7%). It means that Lula is being efficient in the building of his coalition when he distributes pork to legislators who have votes concentrated in specific areas. When we look at the Figure 6, this conditional relationship is clear. As constituent concentration increases, the marginal effect of pork on support also increases. In substantive terms, this means that the president increases his average support by roughly 10% when strategically allocating resources to deputies depending on the constituency type . The results of the full-time and the imputed samples are also similar to those just presented. The graphs for the marginal effects using these samples are almost the same, so, they are not presented here.

In practical terms, my results seem to be very consistent with the idea of credit claiming that I propose in this paper. Given the distribution of constituency types, the percentage of pork allocated and the amount of legislative support delivered by legis-

lators, I believe my story is reasonable. For instance, there are 9% of legislators with concentrated constituencies (GCI .6-.8), 13% in the middle category (GCI .3-.6), while 78% have scattered support (GCI 0-.3). That means a president in Brazil can get 9% more votes on the floor by only directing pork to legislators with concentrated constituencies. This could be enough, for example, when a president is looking for constitutional amendments but only has a simple majority guaranteed in the floor coalition.

The graph for the model that contains Pork.lag also looks very similar. The president increases his average support by 11% if he allocates resources based on deputies' constituency types. The idea behind both models is the same: pork is used as a strategy to increase majorities, or maintain them, but not to build them from the ground up. But the difference among the measurements is still present. In my opinion, however, it seems reasonable that Pork.lag has a different effect on support when compared with Pork. It is worth recalling that these variables measure different things: one emphasizes the voting trade in the same year, and the other expresses the exchange over time. Although my intention when using Pork.lag was not to explain the latter relationship, I believe it is necessary to highlight the importance of time in this relationship. As Pork is translated in bridges, schools, small medical clinics, roads, and so on, there is a certain time period needed in order to complete the projects allocated. My results point in such a direction.

5.2 CROSS-SECTION DATA AND YEAR-BY-YEAR RESULTS

I next depict the differential effects of pork on legislative support, given the constituency type, by year. I fit the same model presented before, but in a year-by-year data set. The results are presented in Table 3 in the appendix. The model contains the same variables, except for the exclusion of term, budget and year fixed effects - as cross-sectional data does not require such time trend controls. I also tried robust estimators and Pork.lag, but similar outcomes led me to present only OLS estimators using Pork as one of my independent variables.

Overall, the general consistency of the results in the fixed effect model is, nonetheless, subject to many remarks when the model is fitted by year. The most important is that my interaction term is neither statistically nor substantially significant for some years. However, I do not think this is a problem. First, if the null hypothesis of no effect cannot be rejected, we cannot reject the hypothesis that Pork*constituency has significant effect over support as well. And second, interactions do not tend to be statistically significant because of the multicolinearity of the terms (Gelman and Hill, 2006). Given these conditions, the graphical interpretation of confidence intervals seems to be much more relevant.

FIGURE 7

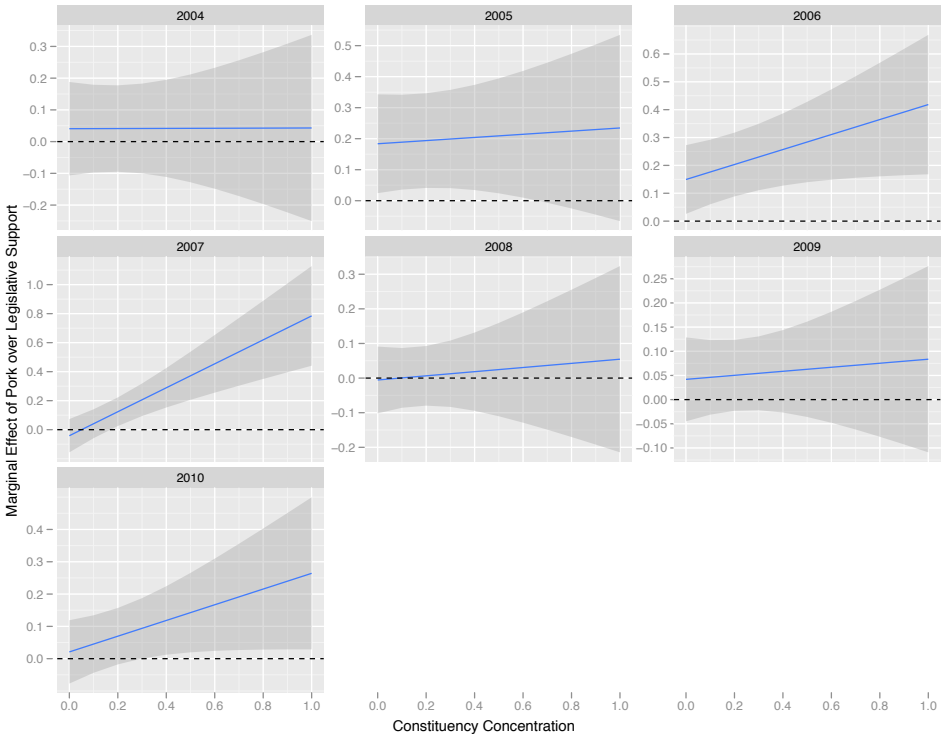


Figure 7, in general, shows stability in the coefficients. The exception is the constituency effect in 2007, the first year of Lula's second term. Carefully reading the graphs, we can say that the Cabinet effect decreases monotonically with the term cycle, ideology does not have any effect on legislative behavior at all, and pork still has a small effect on legislative behavior, all else being equal. Constituency seems to have worked in different ways in the two terms: in the first, it helps to predict a decrease in Lula's legislative support, but in the second, it predicts a huge increase in legislative support. But what about our main independent variable -- is its effect stable over time? Indeed, we have some evidence to argue that the relationship between pork and support is conditioned not only by constituency type, but also by time. As for the dependence of the marginal effect of pork on legislators' behavior over time, the trend can be spotted both in the sheer size of the interactive term coefficients in the year-by-year regressions (see Table 2), and in the slopes in Figure 8.

TABLE 2

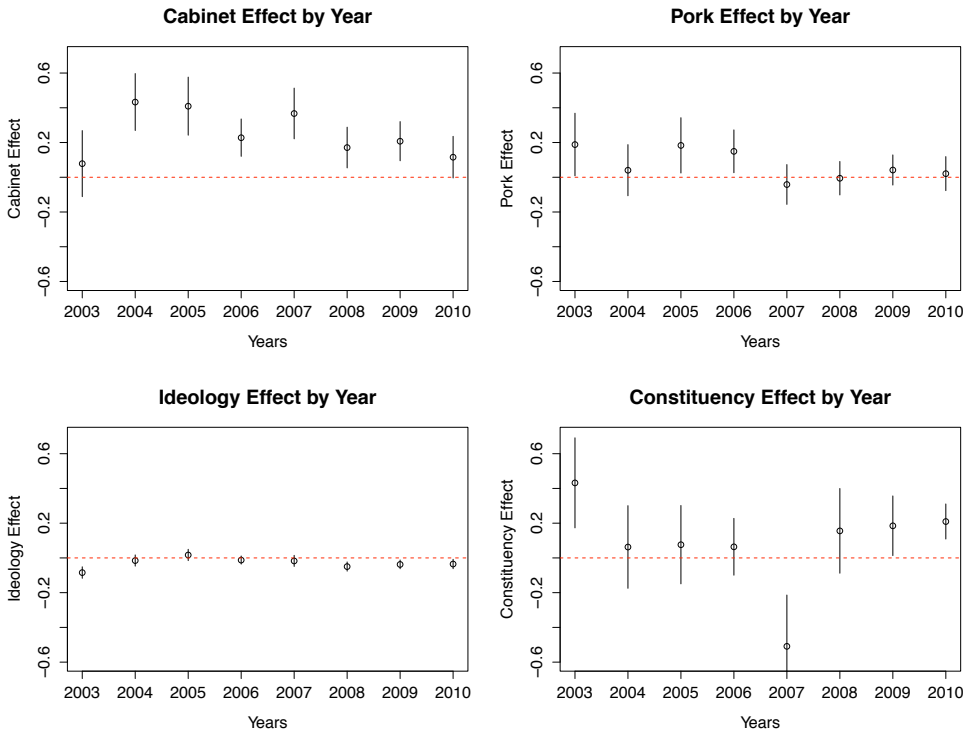
	2004	2005	2006	2007	2008	2009	2010
(Intercept)	0.27 *	0.14	0.36 *	0.49 *	0.64 *	0.50 *	0.58 *
	(0.10)	(0.10)	(0.07)	(0.09)	(0.07)	(0.06)	(0.06)
Cabinet	0.43 *	0.41 *	0.23 *	0.37 *	0.17 *	0.21 *	0.12
	(0.08)	(0.09)	(0.05)	(0.07)	(0.06)	(0.06)	(0.06)
Ideology	-0.01	0.02	-0.01	-0.02	-0.05 *	-0.04 *	-0.03 *
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)
Pork	0.04	0.18 *	0.15 *	-0.04	-0.01	0.04	0.02
	(0.08)	(0.08)	(0.06)	(0.06)	(0.05)	(0.04)	(0.05)
Constituency	0.06	0.08	0.06	-0.51 *	0.16	0.19 *	0.21 *
	(0.12)	(0.12)	(0.08)	(0.15)	(0.12)	(0.09)	(0.05)
Poverty	-0.00	0.00	0.00 *	0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Votes	-0.00 *	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
List	0.00 *	-0.00	-0.00	0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Population	-0.00	0.00	-0.00	-0.00	-0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Capital	0.02	0.01	-0.01	0.03	0.02	0.01	-0.00
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Incab × Ideology	-0.06 *	-0.07 *	-0.01	0.01	0.04 *	0.01	0.02
	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)
Pork × Constituency	0.00	0.05	0.27	0.83 *	0.06	0.04	0.24
	(0.16)	(0.16)	(0.14)	(0.20)	(0.15)	(0.11)	(0.13)
Pork × Poverty	0.00	-0.00	-0.00 *	-0.00	0.00	-0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N	408	315	361	171	303	299	301
*R*2	0.48	0.43	0.44	0.80	0.71	0.68	0.56
adj. *R*2	0.46	0.41	0.42	0.79	0.70	0.66	0.54
Resid. sd	0.17	0.15	0.14	0.10	0.10	0.10	0.11

Standard errors in parentheses

Figure 8 is very clear in addressing the results. There are two different conditional effects of pork over Support, both show some evidence of my argument. The first strongly supports my hypothesis. In 2006, 2007, and 2010, the conditional effect of pork on support, given high levels of constituency concentration, helped Lula to increase his legislative support. The effects observed for those three years are much higher than the ones in the pooled sample. In the other years, the direction of the effect is the same and in the way expected, however, the magnitude of the coefficients is low. This is a less enthusiastic result, as it represents half of Lula's term. One feature of the graphs, though, indicates that my hypothesis could still be observed in those years. If we cannot accept the null hypothesis of some effect given the results, we cannot reject very strong associations as well. The confidence intervals of the estimators give an impression that missing values

are causing the uncertainty here. I tried using the imputed data by year to check for that issue, but the results did not change at all. Only 2008 became a big and statistically significant coefficient, what seems to be further support my argument.

Figure 8

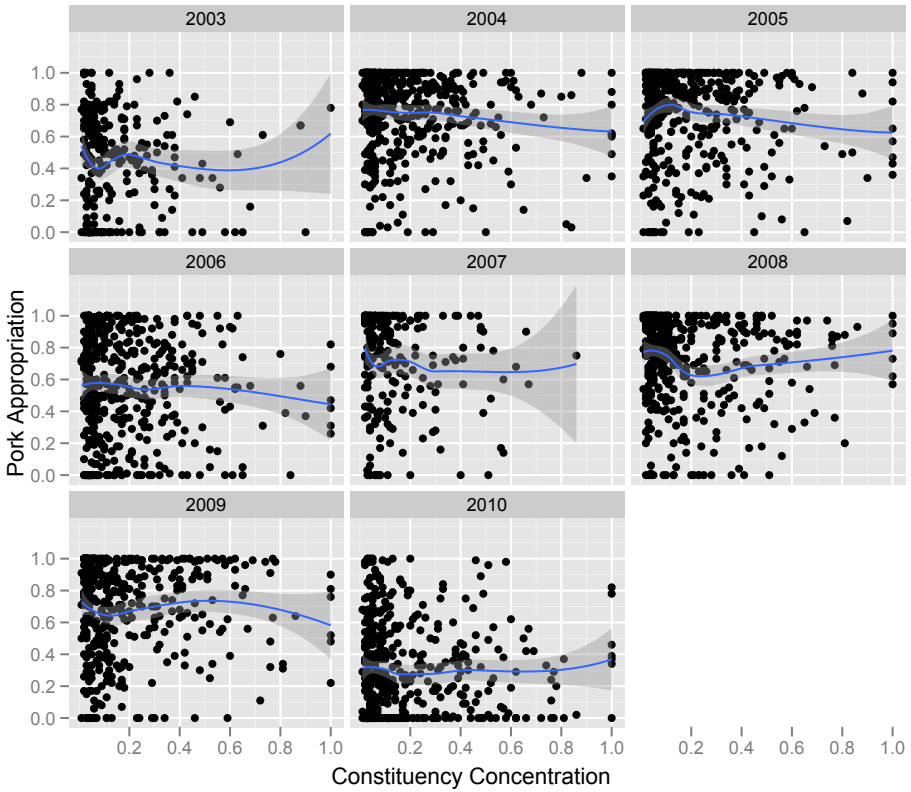


Overall, the results support the main argument presented in this paper. However, while the conditional effect of pork is observed in the pooled, full time, and imputed samples, as well as in five of my seven year-models, it is important to remember that those results refer only to Lula's presidency. The most important implication of my general and initial results is the possibility to show that certain types of constituencies are really more electorally responsive to pork than others. For members for whom the electoral return to pork is high – those with concentrated constituencies – we see legislative votes sold for less, or in other words, there is more support given in exchange for lower rates of pork appropriated. Thus, while presidential support increases in pork allocation for all deputies, it increases more for deputies for whom pork is the most electorally effective. In this paper I identified that legislators with concentrated constituencies tend to be more likely to vote with the president than deputies with scattered constituencies, when receiving the same rates of pork. What I still need to show, however, is that the president knowingly plays this game.

I expect to see the president distributing pork for legislators conditional on the kind of constituency they have, but also given the number of legislators available to negotiate that have each kind of constituency. If the floor were mostly composed of deputies with concentrated electoral support, we should observe presidents buying only those deputies. If the floor were only composed of deputies with scattered electoral support, my theory should not have any importance. But if the floor were mostly composed of legislators with scattered constituencies, and some significant amount of concentrated constituencies, we should expect to see presidents getting the most optimal combination of both – more votes for less pork.

As we already know that during Lula's presidency the floor was populated by 78% of scattered-constituency legislators, we should observe the president spending more pork (total) with scattered legislators. But we also should observe concentrated legislators bought for a lower price. The Figure 9 is a first attempt to asses such a statement. In general the association is not clear, but it seems to not matter at all. In 2004, 2005, 2006 and 2009 the president spent more money on legislators with scattered electoral support, although the negative association is not strong. For the other years, I find no effect.

Figure 9



In sum, I have shown the importance of electoral rules to explain political outcomes in Brazil. The kind of constituency of legislators, as a result of the district size and the OLPR electoral system, is an important predictor of the behavior of legislators during Lula's presidency. The effects are consistent and robust. The substantive interpretation of them shows how they can make a huge difference in the relationship between the president and the deputies. The challenge now is to test whether the conditional effect of pork also extends to Cardoso's presidency, which, if true, would give stronger support for the argument presented here.

6. FINAL REMARKS

I analyzed the Brazilian case during Lula's term (2003-2010) and showed, first, that Lula's government has similar features when compared with Cardoso's presidency. The formation of a cabinet has been the most important predictor of legislative support, and pork has been used as a tool to adjust and maintain the needed majority. Second, this paper shows that the effect of pork on legislative support is conditioned by the geographic type of constituencies the deputies have. As \cite{mayhew74} argues, credit claiming is one of the strategies employed by legislators desiring reelection. Thus, its viability as a strategy is also a condition that explains the relationship between the president and congress. When presidents maximize their partners' utility they achieve a more efficient strategy. I demonstrate that even controlling for cabinet participation, success in obtaining pork, and ideology, we still observe a substantive effect of pork on support, conditioned on each deputy's constituency type.

This paper contributes directly to our knowledge of the inner workings of the Brazilian political system, but also for the understanding of electoral rules' effects on political outcomes. It shows that the composition of legislators' constituencies can explain part of the differences in the president's ability to govern effectively. In addition to the size and composition of the resources distributed, presidents also have to pay attention to how they distribute resources. If a president wants to avoid wasting resources, he should be able to identify cheapest potential partners. Therefore, he should spend pork on deputies who depend on it to continue their political careers. That is true for every presidential system that lives together with a multiparty system. The formation of coalitions requires from the president, strategies to avoid resources being wasted. Moreover, my study highlights the importance of understanding the geographical composition of constituencies in order to understand the daily workings of politics, especially inside a legislature.

The theories of swing voters, for example, could be improved by including a better specification of what kind of geographical constituency is being analyzed. It is possible to believe that the concentration of votes for a candidate, even inside uninominal districts, such as in the United States, has an important role in the way that legislators pursue their career objectives.

My results, following Zucco Jr. (2009) and Raile et al. (2010), indicate that it is possible to think about the relationship between the legislature and the executive beyond frameworks in which the Brazilian Congress is, on the one hand, an arena of the locally minded, pork-seeking, free-floating legislator discussed by Ames (1987), or, on the other hand, a place where internal rules alone are able to constrain parties, and discipline legislators along ideological lines (Figueiredo and Limongi, 1999). My contribution has two implications. First, while coalition incorporation does seem to matter, it does not seem to matter uniformly – even members of the same party with the same amount of cabinet positions, exhibit variation on their individual behavior. This suggests that parties matter because they help mediate the distribution of resources by the president, even though not all exchanges of support for presidential handouts are made through parties. Second, I show that there is an intervening factor between success in getting pork and legislative support. Such evidence was presented by Carvalho (1997), but only partially. His results did not explore the behavior of deputies, but of parties and of groups of legislators in different regions. Thus my use of geographical tools to create the variable constituency concentration represents a major contribution of this paper.

Although the results are only preliminary, the conditional effects presented here open a new research agenda for students of presidential systems with multi-member districts. The next step is to better investigate the time trend observed in this paper, and to think about what happened to the deputies whom were not reelected in 2006. Future research should extend this idea to other countries with similar political institutions. Although this paper calls our attention to the geographic distribution of the votes, I also think it is necessary to continue to investigate the other kind of representation: the thematic one. Many papers raise this difference, but thus far none have worked with it.

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