The Predatory or Virtuous Choices Governors Make: The Roles of Checks and Balances and Political Competition

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Abstract

States usually differ markedly in terms of public goods provision and corruption. Why are some state governments able to provide adequate health and education services, but others tend to specialize in the provision of private goods such as public sector jobs and targeted transfers to specific clienteles? Why are some states better capable of promoting economic development while others allow stagnation? Why is corruption more prevalent in some states than in others? Why are some states more efficient in the provision of publicly-provided goods and service than others? Exploring the idea that political institutions are important determinants of the policies implemented in states, we propose a model of the policymaking process and then test its implications with state-level data for the period 1999 to 2006 in Brazil. The focus of the empirical tests is on the impact of political competition and checks & balances on the characteristics of the policies that emerge in the states. Political competition has important virtuous effects on the choices made by governors and other political actors by determining how long they expect to be in power, what they can do while in power, and at what costs. We develop an index of checks & balances for Brazilian states and test the interaction of checks & balances with political competition. We found that the impact of political competition varies with the degree of checks & balances.

I. Introduction

The main objective of this paper is to understand the conditions leading to predatory or virtuous public policies. Brazil is our laboratory and is ideal because of the variation in socio-economic conditions across the states yet still under the umbrella of the Brazilian federation, which controls for many macro level institutional determinants. The focus of the research is on the determinants of the perceived wide variation in policy outcomes across the Brazilian states. We are particularly interested in corruption and the provision of public goods.

Broadly speaking, Brazilian states exhibit great similarity with respect to their macro level institutional features which are established in state constitutions. Politicians in both the legislative and executive branches are elected every four years under proportional representation, with open lists for the former and plurality with a runoff for the latter. Legislators have no term-limit. Governors are allowed to run for re-election just once and are very powerful at the state level, equipped with several institutional tools to govern. The decision-making process within state legislatures is very centralized with an extremely weak and unprofessional committee system. In fact, legislative bodies are mostly reactive to executive dominance. The state courts are formally independent and in some cases work as an important constraint to the executive's preferences. Every state possesses audit courts that oversee the execution of budgets. Even with these great similarities in terms of their institutional endowments, the twenty-seven Brazilian states are very distinct with regard to their economic and policy outcomes.

Given the same macro state institutional endowments, what are the determinants of the different policy outcomes? We recognize that other economic aspects such as the stock of investment, level of economic integration with other states and with the international market, and foreign investment play important roles in economic and political outcomes. However, we would like to stress that micro institutional aspects related to the state politics and policymaking play key roles in explaining different economic and political performance at the state-level in Brazil. These include political competition measured by electoral competition in the state and national assemblies, margin of victory of incumbents over rivals, electoral volatility, coalition size, and pork barrel allocations. We claim that these factors have a decisive impact on the propensity of politicians to engage in the production of public goods. We also investigate the intertemporal dimension of the choices of governors. politicians' choices. Governors with short political horizons – as opposed to dominant governors that control a state for several terms - will have fewer incentives to provide public goods and promote economic development. Dominant governors, in turn, will have incentives to promote economic development because they feel they will benefit privately from an expanding pool of resources in their states. This is key to explaining the puzzle posed by the existence of governors, in weakly institutionalized states, that engage in predation while others promote welfare enhancing measures and public goods.

In the next section we provide a review of the literature and position our contribution. In Section III, we present an intuitive and formal description of our model. In Section IV we present our empirical results highlighting the roles of checks and balances, and political competition. Finally, in the conclusion we sum up the findings and discuss their implications for future research.

II. The determinants of public goods provision

In the last decade or so, our theoretical understanding of the institutional determinants of good governance and the attending problem of corruption has expanded greatly (Persson and Tabellini 2000; Bueno de Mesquita et al. 2003; Besley 2006; Treisman 2007). The bottom line of this literature is that good governance involves to a large extent the ability to provide public goods. Recent contributions emphasize the incentives politicians have to engage in the provision of private goods. Bueno de Mesquita et al. (2003) have developed a research program aimed at explaining the choice of public goods, private goods and personal wealth, potentially applicable to a great number of political settings, both democratic and non-democratic. They investigate the "circumstances under which leaders realize personal gain, promote public benefits and create special benefits for their political allies ...(t)he degree to which they choose to emphasize one form of benefit over another is shown to depend on the selection institutions under which they operate." The authors find that the size of the governing coalition is critical to the choice of public goods over private goods and self-benefits.

Research on the institutional determinants of the provision of public and private goods in developed and developing countries is burgeoning, but most of the existing empirical studies focus on the national level. A small but growing number of contributions, however, have explored this issue at the sub-national level (Besley, Persson, and Sturm. 2005; Calvo and Murillo 2004; Remmer 2007; Stokes 2005; Magaloni 2002; Chibber and Noorudin 2004). These contributions generally focus on a single factor or on a small number of social and institutional explanatory factors to determine public spending, e.g., ideology, ethnic fractionalization, type of party systems, and credible commitment. Alesina and Roubini (1999) explored the role of ideological factors in public goods provision. In turn, Alesina et al. (2003) argue that ethnic fractionalization and social heterogeneity encourage the targeting of particularistic goods to ethnic groups while discouraging the provision of public goods. A contrasting argument is provided in Chibber and Noorudin (2004) who found evidence supporting Persson and Tabellini (2000) who claimed that proportional representation leads to less public goods provision. Chibber and Noorudin (2004) argue that states with two-party competition provide more public goods than states with multiparty competition, reflecting contrasting mobilization strategies. In two-party systems, political parties require support from many social groups and therefore provide public goods to win elections. In multiparty systems, needing

only a plurality of votes to win, parties use club, rather than public, goods to mobilize smaller segments of the population.

Other contributions emphasize the role of partiesThe role of parties is also emphasized in other contributions, but their focus is on credibility and political market imperfections. Keefer and Vlaicu (2007), for instance, propose a model of electoral competition where candidates have two costly means to make them credible: spending resources to communicate directly with voters and exploiting pre-existing patron-client networks. In their model the costs of building credibility are endogenous and lead to higher targeted transfers and corruption and lower public good provision. A related argument is found in Robinson and Torvik (2005) who argue that oversized infrastructural projects (white elephants) are a particular type of inefficient redistribution, which are politically attractive when politicians find it difficult to make credible promises to supporters. They show that it is the very inefficiency of such projects that makes them politically appealing because it allows only some politicians to credibly promise to build them and thus enter into credible redistribution.

Attributing problems regarding the under provision of public goods to patronage politics is largely tautological - by definition patronage politics promotes selective incentives over the delivery of public goods by discouraging direct appeals to voters that are essential for credible mass-based political parties (Keefer 2005). Remmer (2007) and Calvo and Murillo (2004) focus on the political incentives influencing the ability and willingness of politicians to target public sector allocations to political supporters (see also Alesina, Bakir and Easterly 1999). Political parties diversify their resources, investing in private, club, and public goods for redistribution depending on the different constituencies they target (Magaloni, Diaz-Cayeros and Estevez 2002). Calvo and Murillo (2004) explore a model that considers both the demand side (the varying dependence on public sector resources across constituencies) and the supply side of patronage (where they uncover a partisan bias), and explain why some incumbents are more likely to benefit from pork. The use of particularistic transfers to buy support is widespread in many countries but may look puzzling because if the secret ballot hides voters' actions from patrons, voters are able to renege, accepting benefits and then voting as they choose. However, as argued by Stokes (2005) political machines use their deep insertion into voters' social networks to try to circumvent the secret ballot and infer votes.

Our approach to the study of public goods provision draws on the lessons from existing literature but incorporates a larger set of institutional and political factors (including their interaction). In addition, we build on the insights from the literature on checks & balances. We use an extended notion of checks & balances by including the media, public prosecutors, independent regulatory agencies and audit courts as checks on the spending of governors. Several contributors have showed how governments' influence over the media affects corruption. Adserá at. al. (2003); Brunetti and Weder, (2003); Djankov (2003); and

(Besley and Prat (2006) present evidence that the control of the media by the government affects corruption. In our model we test for the control of the media by the governor as a determinant of public spending. Regarding the role for checks and balances there is a large theoretical and empirical literature supporting the view that the separation of powers improves the quality of government at the national and state level (Persson, Roland and Tabellini 2002; Alt and Lassen 2003; Alt and Lassen 2008). As additional checks on the choices of governors we include judicial and quasi-judicial institutions. Rather than examining each actor or political institution in isolation, we look at the relevant interaction of the institutional players in order to better capture the policymaking process across Brazilian states. By doing so, we incorporate a broader range of players and embed them in models of strategic interactions. This "new separation of power approach" (De Figueiredo, Jacobi, and Weingast 2006) allows us to study interlinked phenomena occurring in multiple institutions.

III. Institutions, players and powers

III a. To motivate our formal model, we provide an intuitive discussion of our hypotheses. The key variables are the level of checks & balances and the level of political contestability in a state. By institutionalization we mean essentially the robustness of checks & balances. High institutionalized political environments are typically states that have effective regulatory institutions, autonomous and independent courts of accounts, state assemblies with professional staff and active commissions, a functional bureaucracy, a proactive public prosecutor's office as well as other oversight and deliberative institutions such as councils. By contestability we mean political competition. Low or non-contestable environments are characterized by control wielded by elites in states. Typically, in Brazil, Governors exercise some or a great deal of control over the media, and over candidate selection at the state level.

Table 1 shows the possible combination of these variables and the likely outcomes. In the upper right cell, low contestability co-exists with weak checks & balances. Because contestability is low, and political elites dominate the political space, the political elites may have long policy horizons. However, in these circumstances there are incentives for entrepreneurialism in the state and for the creation of a professionalized bureaucracy and fiscal austerity. Governors are encouraged to engage in the production of public goods that produce results in the long run. However because of the weak checks and balance institutions there would also be incentives for elites to engage in private goods provision and to appropriate public resources for private use.

In the upper left cell, there is a combination of high contestability and weak checks & balances. In this case there are strong incentives for the provision of private goods and corruption, because elites have a short time horizon. Low levels of checks & balances provide the ideal setting for predatory

practices, particularly if the level of contestability is high. We expect low incentives for the supply of public goods and consequently poor developmental outcomes.

The bottom row represents cases of high levels of checks & balances. High levels of checks & balances create incentives for the supply of public goods, but its interaction with levels of contestability may produce divergent outcomes. Low contestability may create incentives for clientelism, which is mitigated by strong checks on the executive. In turn, high levels of contestability may create policy volatility in case there is strong adversarial political tradition in the state. This is the case when good projects are discontinued because of preference polarization or predatory practices adopted by the elites to differentiate themselves from their adversaries.

[Table 1 about here]

III b. Theoretical Model

The discussion above motivates our formal model of the choices governors make about public spending. The governor of a state maximizes votes and money. Votes include both votes for the governor's own reelection as well as votes for a successor, given the existence of term limits in Brazil. Money is desired both for its own sake and in order to purchase votes through electoral campaigns. The governor's choice variables are E_u and E_R which are the amount of effort the governor and his staff allocate towards producing, respectively, public goods, P_u, such as public safety, health, and education, and private goods, P_r, that is goods that benefit specific small closed groups.[1] There is a limited amount of effort available to the governor, $\overline{E}$, so that $E_u + E_r = \overline{E}$. In addition the governor chooses how much of the resources received from private groups are allocated to pursue reelection (or making a successor) and how much is pocketed for personal gain. Let α be a variable that measures the share of total resource received by the governor from private groups and through corruption (e.g. overinvoicing) that are used for electoral purposes, where $0 \leq \alpha \leq 1$.

The governor thus chooses E_u, E_r, and α so as to solve the following problem:

$$\underset{E_u, E_r, \alpha}{Max}\, U[V(P_u(E_u), P_r(E_r), \alpha R(P_r(E_r)), (1-\alpha)R(P_r(E_r)), C((\alpha, \theta)]$$

subject to (1)

$E_u + E_r = \overline{E}$ and $0 \leq \alpha \leq 1$.

The objective function shows that the governor's utility is affected by both votes $V(\cdot)$ and by the share of resources that are pocketed. Votes are influenced by the public goods provided by the governor P_u and through the private goods provided to the interest groups P_r. In addition votes can be obtained through electoral propaganda which is purchased using the resources R provided by the private groups. A

[1] In order to simplify the presentation only one private group is included. This can easily be generalized to allow for n groups (see, for example, Denzau and Munder 1986).

fraction α of the resources is used for electoral purposes and remaining *(1- α)* is appropriated by the governor. Increased resources for personal uses raises the Governor's utility but also has a cost, $C(\alpha,\theta)$. This term is the expected cost of being caught and prosecuted appropriating public funds, capturing both the legal penalties involved as well as any potential electoral cost, such as loss of reputation. The cost is inversely proportional to the share of funds used legitimately. The parameter θ measures the probability of being caught, so that $C^{\theta}>0$. The first order conditions that solve this problem are:[2]

$$\frac{\partial U}{\partial E_u} = U^V V^{P_u} P_u^{E_u} - \lambda = 0 \qquad (2)$$

$$\frac{\partial U}{\partial E_r} = U^V [V^{P_r} P_r^{Er} + V^R \alpha R^{P_r} P_r^{Er}] + U^R (1-\alpha) R^{P_r} P^{E_r} - \lambda = 0 \qquad (3)$$

$$\frac{\partial U}{\partial \alpha} = U^V V^R R(P_r(E_r)) - U^R R(P_r(E_r)) + C^{\alpha} \Rightarrow U^V V^R = U^R - C^{\alpha} \qquad (4)$$

Where λ is the Lagrange multiplier on the restriction $E_u + E_r = \overline{E}$.
Equations (2) and (3) together yield the following condition:

$$U^V V^{P_u} P_u^{E_u} = U^V V^{P_r} P_r^{E_r} + U^V V^R \alpha R^{P_r} P_r^{E_r} + U^R (1-\alpha) R^{P_r} P^{E_r} = \lambda \qquad (5)$$

This condition states that the marginal unit of effort will always be placed in that activity (public or private good) which yields the greatest electoral return to the governor, given α. The term on the left measures the gain from the marginal unit of effort on the public good, which comes through votes. The middle term measures the gain from the marginal unit of effort on the private good. This comes in three ways: (i) through the marginal votes generated by those policies (first part of this term); (ii) through the marginal votes purchased with resources obtained in exchange for effort for private goods; and (iii) through the marginal resources that the governor pockets due to the additional effort for private goods. In equilibrium the gain in utility to the politician from the marginal unit of effort must be same for private and public goods and is equal to λ.

Similarly, condition (4) states that the decision whether to use resources for electoral or for personal purposes is taken so that the marginal *real* (R$) goes to that purpose which generates most utility. Thus in equilibrium, the utility from the marginal *real* is the same whether it goes to finance the governor's campaign or his bank account.

Our primary interest in this paper is to analyze how the equilibrium values of the dependent variables E_u, E_r, and α are affected by checks & balances and by political competition. Both of these

[2] Let superscripts denote derivatives.

factors enter as parameters in several of the functions in equations (2-5). In appendix A we provide a brief discussion of each of these functions as they are the channels through which the impact of checks & balances and political competition affect governors' choices over public policies. This will set the stage for the next section where we test for these impacts econometrically. In addition a set of controls is added to take into account the effect of each state's economic and social level of development.

Let the level of checks & balances be denoted by θ, that of political competition by π, and the social/economic effects as ψ. In what follows we present the comparative statistics exercise with the function denoting the productivity of effort in producing public goods - $P_u^{Eu}(E_u, \theta, \pi, \psi)$ - and discuss the results for the remaining other functions in the appendix. This function measures the amount of additional public good that materializes when a governor allocates a marginal unit of effort towards E_u. We explicitly note that it is affected by both θ and π. There is no theoretical reason for expecting the signs of these impacts to be either positive or negative. To see this consider, as an example, the impact of a change that increases the level of political competition faced by a governor. Depending on the circumstances, this change may lead to either more or less public good being produced from the marginal level of effort. Note that what is under consideration here is not how much effort the governor decides to dedicate to public goods but rather more narrowly the amount of public good that results from the marginal level of effort, whatever the optimal level of effort for public goods may be. Suppose for example that the increased level of political competition leads to a situation where the governor needs to bring additional parties into his coalition. Conceivably this may make the process of proposing, approving and implementing the legislation that generates the public good slower and more cumbersome as it requires more negotiation within the coalition. On the other hand it may be that the presence of these new parties in the coalition may provide more pressure for the public goods to be provided in a timelier and more effective manner. The point is that there is no reason to suppose that $\frac{\partial P_u^{E_u}}{\partial \pi}$ will necessarily have an unambiguous sign (the same being true for $\frac{\partial P_r^{E_r}}{\partial \pi}$.) In the same manner, improved checks & balances may either improve or depreciate the productivity of effort in producing public goods. This being the case, the net impact of π or θ on E_u, E_r, and α will be an empirical issue, which we will test in Section 3. Similar reasoning holds for the impact of θ on the dependent variables (see the example below).

Although the results in Appendix A do not yield nice tight hypotheses that can be tested, it reflects the complexity of the relations that are being studied. Given the unwieldy nature of those expressions, attempts to force an unambiguous prediction by assuming away certain relations and ad hoc postulating of the signs of others, would abstract too much from reality and not provide useful results for understanding the nature of the relationship between political institutions and economic performance in Brazilian states. Instead our empirical strategy is to estimate reduced form regressions that will tell us the

net impacts of those parameters. The hypotheses being tested are whether checks & balances, political competition and social/economic variables affect governors' public policy choices. If they do, then we also want to ascertain the direction of the net impact.

IV. Measuring the and Testing Impact of Checks & Balances and Political Competition on Public Policy

The model presented above shows how the decisions of governors about providing public goods, private goods or personal benefits is determined by parameters related to checks & balances, political institutions, as well as economic and social characteristics of the states. The discussion of the model showed the channels through which the parameters exert their effects and gave concrete examples of the parameters. In this section we test for the impact of the parameters on the choices of governors. That is, we map from institutions to the characteristics of public policies. We estimate reduced form equations using panel data for all 27 Brazilian states for the two legislatures of 1999-2002 and 2003-2006.[3]

Dependent Variables

The first challenge in pursing this strategy is to obtain measures of the dependent variables. We use six different measures of public goods, private goods or corruption. The most obvious way to capture the provision of public good is to directly measure expenditures in these areas. We use the expenditures in health and sanitation divided by total expenditures. However, public goods do not only come in the form of expenditures directly aimed at the final recipient. Public goods can also take the form actions that improve the functioning of government, such as improving the tax system or realizing important reforms. Many of these actions require upfront costs and yield benefits in the future, so that a politician's choice on whether to pursue these actions will depend on her political horizon. We pursue a measure of public goods of this nature by using as a dependent variable an index of expenditure efficiency in the states developed by Ferreira Júnior (2006), which covers the period of 1995 to 2004. The index is a ratio of the part of total expenditure that is effectively spent in the final public good that is being provided (including debt) divided by the administrative and other intermediary costs involved in producing those services. States with a higher value of this index provide more public goods at a lower cost. This index also partly captures the notion of private goods, as a low value of the index might reflect larger chunks of the state budget going to groups such as civil servants and construction companies rather than to the final service itself. The rationale behind using this variable to capture the notion of the governors' choice to provide public versus private goods is that improving the index, that is the 'efficiency' of public expenditure is a difficult task for a governor, who will or will not be willing to incur such costs depending on the level and type of political competition that she faces as well as on the level of institutionalization in the state.

[3] Earlier periods were not included due to the lack of data for several variables for those periods.

Governors that foresee longer expected periods in office will be more inclined to seek improvements in expenditure 'efficiency.' Similarly, governors in states that are more highly institutionalized and have more checks & balances – e.g., independent judiciary, public prosecutors, audit office, free press, and vigilant society - may have less ability to opportunistically refrain from investments in improving expenditure "efficiency."

A measure of private goods which we use as the dependent variable is the percentage of total expenditures that are used for civil service salaries and benefits. Doling out jobs has been a traditional form of patronage in Brazilian state and local politics, which only recently started to be reined in by the fiscal responsibility law. The idea is to determine whether political competition and checks & balances affect governor's decision to indulge in this practice. In addition, we measured the variation in civil servant expenditures from the first two years in a term to the second two years, so as to see if the effect of the proximity of the next election in increasing this form of patronage is also affected by political contestability and checks & balances.

The final dependent variable that emerges from the model presents an even larger challenge to quantify, as data on corruption and illicit activity by politicians are generally not available. In order to provide a measure that proxys for the amount of personal benefit the governors and other politicians achieve from office, we use data from the Superior Electoral Tribunal that requires all candidates to political office to publicly declare their wealth. The data is not without problems as a politician can always lie or underreport his holdings and also because there is not data for all politicians as some fail to report and others do not run for office at the end of their term so that they do not need to report their wealth again. Clearly this provides the potential for there to be a selection bias. Note, however, that our observations are at state level and not at individual level. We take the average wealth variation for all state deputies. Thus the final variable used does not contain a selection bias. It may not be a good proxy if the number of deputies sampled to create each state's observation is not representative, however there will be no selection bias as related to econometric estimation. In any case, we mitigate this problem by using the number of deputies that was used to create each state observation as a regressor in the panel regressions.[4] Table 2 summarizes the dependent variables we use and provides the sources.

[Table 2 about here]

Explanatory Variables

As explanatory variables we need measures of the various parameters from our model. We discuss in detail below our index of checks & balances. Most of the other variables capture different aspects of political competition and fragmentation in each state. We use both the number of effective

[4] In his study of campaign finance, Samuels (2002, p. 851) points out that the data conform to commonsensical expectations regarding cross-candidate, cross office, and cross-partisan differences and that such patterns could never emerge if the declared contributions were false.

parties as well as indices of electoral competition in the state assemblies. We also include the number of parties in the governor's coalition, which affects the executive's ability to pass his agenda through the legislature.[5] We also have the margin of victory of the current governor in the previous election (in the first round) which provides a measure of power and expectation of remaining in power. In the same vein we created a variable capturing the power of governors by interacting a dummy binary variable for those governors that won in a subsequent with the margin by which they won. This variable selects for those governors that had good expectations of remaining in power and thus allowing us to test the impact of longer decision horizon on policy choices. In coming "pork" from the federal level may also affect the choices of governors because many of the amendments involve public works contracts, they potentially create opportunities for corruption that involve state and municipal level politicians such as governors, mayors and deputies (Samuels, 2002). As an additional proxy for political competition we have data on electoral campaign expenditures, which the candidates have to declare to the Superior Electoral Courts after the election. The total spent in campaigns is summed for the state and divided by the GDP. Presumably the more spent the tighter the race. The final explanatory variables are education, GDP per capita and income concentration (Gini). Education is used a proxy in the model for the electoral response to public and private goods. GDP per capita and income concentration control for a series of other variables that are related to the stage of development of the state and its level of income. The description of the explanatory variables and their sources are summarized in Table 3.[6]
[Table 3 about here]

Measuring Checks & balances

Whereas there are several obvious and readily available variables for measuring political competition, it is not so easy to get a measure of checks & balances, a concept which is not even straightforward to define. In order to create an index of checks & balances, we collected state-level data on seven variables. The focus is on the existence, effectiveness and independence of several types of agencies and organizations that have important roles in checks & balances at different levels of government, such as the judiciary, public prosecutors and the media. These variables are described in Table 4, along with their sources. We transformed the measures into a single index by taking the first component of an analysis of principal components and subsequently normalizing to range from zero to one.[7]

[5] Ideally we would like to have measures of whether each governor faced divided or unified government; however such data is not available for most states, especially as it can change across the same legislative term, according to the evolution of the political cycle.
[6] Descriptive statistics of all dependent and explanatory variables are shown in the Appendix.
[7] We reduced the three variables for the judiciary and the three variables for public prosecutors to single indices by principal component analysis prior to principal component analysis using all seven variables in Table 4. Note that

[Table 4 about here]

The checks & balances index is shown in Table 5 ranked from highest to lowest. Overall the results are intuitive and fit reasonably well with common preconceived notions of which states have better institution. The bottom states are all state which our prior belief expected to find at the end of the list and Rio Grande do Sul at the top also seems to fit. Overall the index seems reasonable and will be used in the econometric tests both to estimate its direct effect on the dependent variables as well as its effect on the way political competition affects the dependent variables.

[Table 5 about here]

Estimation Results

The purpose of the estimations is to analyze how political and institutional environments affect the characteristics of the policies that emerge from Brazilian states. The six dependent variables (see Table 2) capture choices by governors to provide private goods, public goods or personal gain. The two variables that represent private goods are expenditures on civil servant expenditures, and the variation in expenditures on civil servants the political term. The three variables that measure public good provision are the primary deficit, health expenditures and expenditure efficiency. The final variable captures corruption which proxy by the variation in the wealth of politician over the political term. We regress each these variables against a series of explanatory variables that can be classified into three subsets of variables. The first is the checks & balance index described in the previous section, which provides a quantitative measure of the level of institutional constraints against opportunistic behavior by the governor. The second is a set of variables that measure the level of political competition or contestability faced by the governor. Finally there are variables that control for general economic and social features of the state, namely, GDP per capita, wealth concentration and education. In addition, we control for fixed effects. The estimations are thus reduced forms that capture the net effect of the parameters of the model on the dependent variables, without the pretence of estimating a structural model that would include the relationship among the dependent variables. We used a panel of all twenty-seven Brazilian states across two periods that cover two sets of four-year political terms (1999-2002, 2003-2006). Estimation was done

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we estimated the two periods together so as to create an index that is comparable across time. The normalization was done using the following formula: $(x - Min\{x_1, x_N\})/(Max\{x_1, x_N\} - Min\{x_1, x_N\})$, which does not distort the variable distribution. In addition to this procedure, we also created a checks & balances index using the average of the ranks of each variable, so as to allow for comparability among variables with different units. The principal component index and the rank index were highly correlated (0.88), which provides evidence of the robustness of the result. In the end the principal component index was chosen because this has become the standard procedure for creating indices in recent literature.

controlling for fixed effects except in two cases where a Lagrange multiplier test recommended random effects.[8]

When analyzing the results it is important to keep in mind the discussion in the previous section about the expected impacts of checks & balances and political competition on the dependent variables. The model shows that these factors work through a large number of channels (see Appendix) and that the final impacts of checks & balances and political competition on the choices of governors are ambiguous.

In Table 6 we present the estimation results for the first five dependent variables. In column 1 'civil servant expenditures as a percentage of total revenues' was regressed against the three subsets of variables described above. As noted, jobs in the civil service have been a major form of patronage in Brazilian politics and serve as a measure of private good provision. The coefficient on the checks & balances index is negative and statistically reliable (5%), indicating that constraints from other governmental branches and agencies, such as the judiciary, public prosecutors, state audit offices, and the media, do constrain the historic propensity by governors engage in patronage politics. A one standard deviation increase in the checks & balances index, with all other explanatory variables at their means (dummies set at zero), decreases the percentage of expenditures on civil servants from 43.6% to 38.3% of state revenues. This is a large impact and indicates that the characteristic of a state's institutional environment which we call checks & balances is an important determinant of a state's public policy.[9]

Of our measures of political competition, three variables were found to have statistically reliable effects on the expenditures on civil servants. The first is the level of electoral competition for the state assembly (candidates per seat), which has a non-linear impact, increasing expenditures at low levels of competition and decreasing them at levels greater than 5 candidates per chair (the average is 4.6). This result indicates that states with high levels of electoral competition will, *ceteris paribus*, have lower public employment. Because this is a traditional form of patronage in Brazil, this result can be interpreted as indicating that after a threshold level, electoral competition has a virtuous effect.

The two other political competition variables with significant effects in column (1) both measure aspects related to the time horizon of the governors. The first is the margin of victory in the future election for governors who went on to run for another term. This variable captures the expected

[8] In two cases a Lagrange multiplier test recommended random effects. Note that simultaneity is not an issue in these regressions as there is no reason to suspect that the variables that measure governors' choices would have reverse causation on checks & balances or the variables that measure political competition. Given the small sample size relative to the large number of potential explanatory variables, specifications were chosen dropping statistically insignificant variables, except for the checks and balance index and GDP per capita which were maintained throughout.

[9] Although considering the impact of a one standard deviation change is standard practice and makes sense to compare the variation across states, it is important to keep in mind that a state's checks & balances typically change very slowly so that one would not expect such a leap across a four year political term. For our data the checks & balances index had a standard deviation of 0.229, whereas the average increase from the 1999-2002 term to the 2003-2006 term was 0.000037, with a minimum of -0.06 and maximum of 0.187.

probability of remaining in office, as victories with high margins are generally not surprises but rather well anticipated in advance. This variable should vary positively with the time horizon of governors. The second is a dummy for lame duck governors, who are already in their second term and thus ineligible to run for reelection and should capture a shorter time horizon. Our results indicate that both variables reduce expenditures on civil servants. Governors who expect to remain in office for an additional four years seem to refrain from patronage hiring whereas lame duck governors, who have shorter horizons in office, also seem to indulge less job distribution. A possible explanation is that the creation of jobs yields more benefits over time, in the form of sustained support from the individuals, rather than in a one-shot lump sum. As such it is of less use to an outgoing governor who will prefer, perhaps, to pursue in-pocket resources.

GDP per capita and income concentration (gini coefficients) entered the regression to control for the level of development and socio-economic characteristics of states (education was not found to be statistically significant). The results show that, *ceteris paribus*, richer states tend to have lower expenditures on civil servants as a percentage of revenues. Greater income concentration in states results in higher expenditures on civil servants, though the effect is non-linear and reduces as concentration increases. We control for other time-invariant state characteristics by fixed effects. The reported R^2 is the within-R^2 as we are performing fixed effects estimation.[10] The value of 0.75 indicates that our three subsets of explanatory variables explain a good portion of the variation in the dependent variable.
[Table 6 about here]

The second column in Table 6 also uses civil servant expenditures (%) as a measure of private goods, however, rather than using the average value over the four years in the political term it uses the increase in the averages of the first two to the last two years. By this regression we assess whether checks & balances and political competition have a varying effect depending on the political cycle, i.e. the distance to the next election. The average variation in civil servant expenditure within the electoral cycle is small (approximately only 2%), but this masks the much greater variation across individual states (maximum 44.9% and minimum -46.9%).

Column (2) in Table 6 shows that increases in checks & balances reduce the propensity to hire more civil servants as an election gets nearer. A one standard deviation increase in checks & balances, with all variables at their means (dummies set at 0), would cause the variation in civil servant over the electoral term to change from 0.6% to -20.3%, once again quite a significant impact.[11]

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[10] The within R^2 is a measure of how much the model helps when trying to predict a new observation on one of the states already in our sample.

[11] Because the dependent variable is a variation, we control for the initial level of civil servant hiring in each term. As expected this variable is found to have a negative impact on the subsequent variation, indicating that those states that already have hire levels of hiring have less room for increased hiring.

We found that four of our political competition variables had a statistically reliable and large impact on the change in the percentage of the budget allocated to civil servants. Both higher levels of electoral competition in the state assembly and greater number of parties in the governor's coalition constrained hiring as the election approached. These results provide empirical evidence that the net impact of political competition on private goods is negative, that is, $\frac{\partial E_r}{\partial \pi} < 0$. The regression also showed that states whose governors were from the same party of the President, tended to increase their hiring over the electoral term less than those from other parties. In addition it was found that lame duck governors tended to increase their hiring over their terms. Column (1) showed that lame ducks governors tended to hire fewer civil servants than the other governors. Column (2) shows that those civil servants that they did hire were predominately towards the end of the terms of governors. That is, although they prefer to put less effort towards providing private goods in the form of government jobs, possibly to concentrate on personal benefits, they do nevertheless have the incentive to establish a *fait accompli* to tie the hands of the next administration by hiring more workers. Although GDP per capita was not found to be significant it was kept in the regression to control for economic and social characteristics of the states.

In Column (3) of Table 6 the dependent variable is the average primary deficit of the state in each four-year period.[12] The idea is that keeping public finances in order provides benefits to the citizens of a state as a whole and as such has the qualities of a public good. Furthermore, balanced public finances require effort from the government and have high opportunity costs, in the sense that a governor with a short horizon would have much to gain from incurring deficits. The impact of checks and balances on the deficit is negative, though convex.[13] As seems reasonable, states where several different actors, such as audit offices, public prosecutors and the media, can constrain the executive tend to have lower deficits or higher surpluses, *ceteris paribus*. With all explanatory variables at their means (dummies set at 0 and period set at 1999-2002) a one standard deviation increase in the checks & balances index leads to an increase of the surplus from 6 % to 15%. Once again the evidence points to a large impact of checks & balances on public policies.

Of the political competition variables we found three of the coefficients to be statistically reliable and large. The first is the coefficient on electoral competition in the state elections for federal deputies. Representatives in the National Congress play an important role in defending the states interest at the federal level and in particular in assuring higher transfers to the state. Clearly the level of competition among the group of federal deputies will affect their ability and propensity to cooperate or compete in that task. Similarly the relationship between the governor and the deputies should have important

[12] The higher the value the greater the deficit, so that negative values indicate surpluses.
[13] The curve for predicted primary deficit slopes negatively from 0 to 0.77 and then rises. All 54 of our observations are on the negative portion except for three.

consequences for the policies adopted. Despite the importance for cooperation it is not clear *a priori* what the impact of competition will be on the characteristics of public policies. Our results show that higher levels of competition lead to lower deficits. On the other hand, a larger number of parties in the governor's coalition in the state assembly lead to greater deficits, possibly due to the need to appease more interests. The data also indicate that governors that are from the same party of the President (FHC in the first period and Lula in the second) tend to have less fiscal discipline. In principle, greater proximity to the federal government could lead to either better or worse public finances, for example through larger transfers or through less strict application of fiscal responsibility rules. Our results indicate that the predatory effect dominates. Lastly, the social-economic controls indicate that richer states (total GDP rather than per capita GDP) and more educated states have lower primary deficits *ceteris paribus*.

In the last column of Table 6 the dependent variable is health expenditures as a percentage of total expenditures, an attempt to measure the provision of public goods in a very direct way. We found checks & balances to be positively related to health expenditures - at a 10% level of statistical significance. With all variables set at their mean values (dummies set at zero) the level of health expenditures rises from 13.5% to 15.8% of total expenditures. This is a sizeable impact, though we cannot tell from this analysis whether the additional expenditures come at the cost of other public goods or more narrowly targeted policies.

Political competition is also found to have a virtuous effect on health expenditures. States with greater electoral competition, both at the state and federal level, as well as states with more effective parties in their state assemblies, have a higher proportion of their expenditures going towards health. Lame duck governors, on the other hand, tend to have lower spending in this area, as do governors who are of the same party of the President. In both of these instances the effect of lower competition is to reduce the level of public good. It is also found that states that receive more pork in the form of individual budget amendments (divided by GDP) have greater health expenditures, possibly because these amendments often revert directly into health related expenditures or, alternatively, they free up resources from other areas to be used for health. Finally, richer states spend a higher proportion of their total expenditures on health, though the effect is not statistically reliable at conventional levels.

In column (1) of Table 7 we present the results for a variable that captures the decision of the governor to seek her own benefit as opposed to that of the public as a whole or of private groups.[14] We refrain from calling this a corruption equation as corruption may also be a means to provide private and even public benefit. Because seeking personal benefit is typically illicit there is no data available that

[14] For this set of results we estimated the model using random effects because a Hausman specification test under the null hypothesis that the individual effects are uncorrelated with the other regressors in the model did not reject the null hypothesis: column (1) - χ^2_8 = 9.17, p-value = 0.3282; column (2) - χ^2_6 =4.10, p-value = 0.6636. Note that this test is performed without an intercept or dummies.

measures this behavior directly. As a proxy we use the increase in personal wealth as declared by state deputies to the Supreme Electoral Court before and after each four years in power. Ideally we would have liked to use data for the increase in the wealth of governors as the dependent variable, but there were many missing observations as governors who could not or did not chose to run for office after their gubernatorial term did not have to declare their wealth. Our assumption in using state deputies is that there is a high positive correlation between the increase in wealth of the governor and other politicians in any given state.

Column (1) shows that the checks & balances index has a non-linear negative and increasing impact on wealth variation, indicating that those states with checks on behavior (as measured by the quality of the judiciary, public prosecutors, audit offices, media, regulatory agencies, civic community and the judicial watchdog) have lower levels of increases in wealth for their state deputies. A one standard deviation increase in checks & balances, with all variables set at their mean levels, reduces the average increase in the wealth of politicians from 232% to 168% over the four year political term. This result indicates that in states with higher rankings in the checks & balances index there are forces that mitigate the use of power by politicians to pursue their own wealth. Ideally we would like to make this claim for the specific case of the state Governors, but due to the lack of data on their wealth variation, we can only presume that the same effect holds for them.

Several political competition variables were found to affect the variation of politicians' wealth. The effect of electoral competition within the state assembly has a negative and statistically reliable (10%) effect on the wealth variation of the deputies. This index measures the relative number of candidates per seat, indicating a virtuous effect of political competition in checking opportunistic behavior. Similarly, the greater the number of parties in the governor's coalition, the lower the increase in the wealth of state deputies (significant at 5%). We did not have a prediction on how the number of parties in the coalition would affect the ability to accumulate wealth through kickbacks. Having to attract and manage a more fragmented coalition might require that the governor concede more benefits to the deputies of the coalition. On the other hand, if the governor has a supermajority, then having more parties in the coalition might allow the governor to play off one party against the other and thus have to concede fewer benefits. That the effect is negative provides evidence once again of a virtuous impact of political competition.

Our results also indicate that the greater the number of effective parties for which the state has representatives in the National Congress, the greater is the increase in wealth of the state deputies. This is a case where more political competition or fragmentation leads to more personal benefit to politicians within the state. Our model does not predict the sign of the relationship between federal and state deputies; our result only suggests that there is a robust positive connection reflected in the data. In order

to interpret this it would be necessary to analyze the relationship between the local politicians (state deputies and mayors) and the states' federal representatives. Presumably the key to understanding this relationship is in the pork brought by the federal legislators to local specific areas in the state, which is crucial for strengthening popularity and reelection chances. This process is also an important source of corruption as the implementation of the projects involved allow for over-invoicing and kick-backs. One way to interpret our result is that in states where there are more parties bringing in the pork, state deputies are getting a larger share.

The wealth of deputies also increases more in states where governors win the next election, and when their margin of victory is greater. We constructed this measure to capture the effect on governors of feeling safer in office. The positive and significant (1%) estimated coefficient shows that those governors with longer-term horizons allowed greater increases in the personal wealth of state deputies. This result is contrary to the notion of an end game giving incentives for opportunistic behavior. It may be that governors that will be in power for a longer period are more powerful and better able to resist investigation and prosecution as they have privileges and immunities while in office, which leads them to more, rather than less, opportunistic behavior. Finally, GDP per capita was not found to be statistically significant but was nevertheless maintained to assure that the checks & balances variable is not simply capturing the effect of greater economic development.

[Table 7 about here]

The second column in Table 7 shows the results for the variable that measures expenditure efficiency. The basic idea is that improving expenditures has the characteristics of a public good in the sense that it benefits the population at large, as well as having investment-like qualities in that such efforts typically have upfront costs and deferred benefits. Because some states start off at a higher level of expenditure efficiency, they have less room for improvement, so we use the initial level of expenditure efficiency as a control: its value in 1998 for the first term and for 2002 for the second term. The estimated coefficient for this variable is negative but not reliable at generally accepted confidence intervals.[15]

Our results show that the index of checks & balances had a positive and significant effect (5%), on expenditure efficiency. A one standard deviation increase in the checks & balances index - with all variables set at their mean values- increases the expenditure efficiency measure from 16% to 43% which is a very dramatic improvement, though we note once again the caveat that typically checks & balances evolve slowly over time.

As before, we found that electoral competition in the state assembly has a virtuous effect, leading to higher levels of expenditure efficiency improvement. However, the opposite effect was found for

[15] For the second period we only had expenditure data for 2003 and 2004. The addition of 2005 and 2006 should strengthen our results as many effects may come into play towards the end of the term.

electoral competition in the House of Representatives. None of the other coefficients for our political competition variables were statistically reliable.

What lessons regarding the determinants of the choices by governors on the provision of public goods, private goods and personal benefits can be summarized from the six regressions in Tables 6 and 7? Our results indicate that checks and balances have a virtuous impact on the behavior of governors; the level of public goods increases, while private goods personal benefits fall. It is important to point out that this result is not simply a spurious correlation of the checks & balances index with higher levels of development, as we controlled for GDP per capita in all the regressions. The second conclusion is that political competition variables are highly influential in the policy choices of governors. In general the political competition variables have a virtuous effect, increasing the provision of public goods and reducing private goods and personal wealth. Finally, we found that the social and economic variables, GDP per capita, education and wealth concentration, had surprisingly little explanatory power.[16] The results lend strong support to the importance of political and institutional determinants of policies.

V. The Interaction of Political Competition and Checks & Balances

The model in Section 3 predicted that political competition and checks & balances are key determinants of the characteristics of the policymaking process and the regressions in Section 4 provided evidence of the signs and magnitudes of those relationships. We found that political competition has virtuous effects in some cases but predatory effects in others.[17] In addition, the coefficient on the checks & balance variable was large and statistically significant in all of the regressions and found to always have virtuous effects. We now turn to an investigation of the possible interaction between political competition and checks & balances. Our model allows for the possibility that checks & balances works indirectly by affecting the way political competition impacts policy choices. For example, the impact of a political competition variable may be stronger or weaker if checks & balances are more highly developed. In principle both of these dimensions can reinforce each other or work in opposite directions. Here we sort out whether such an interaction exists and if so what form it takes.

The strategy that we pursue is to interact our checks and balances measure with our political competition variables to the prior regressions. That is, we can quantify and draw inferences from the varying effect of political competition on policy characteristics as the level of checks & balances changes. This will allow us to determine, for example, whether the effect of political competition on politicians' wealth variation gets more or less restrictive as we move form states with lower to higher levels of checks

[16] In previous versions we included variables for poverty, the Human Development Index, natural resources, exports and violence, but none of these variables had an impact on policy.

[17] We consider the effect of a variable virtuous when it leads to an increase in public good or a decrease in private good or personal benefit. A variable that leads to the opposite results is considered to have a predatory effect.

& balances. If we find that the effect of political competition gets stronger (that is, larger in absolute terms) in more institutionalized states, then we can conclude that political competition and checks & balances are complements. If the effect of political competition gets smaller or even becomes statistically equal to zero, then we can conclude that both of these dimensions are substitutes.[18]

We re-estimated each of the six regressions in Tables 6 and 7 including a multiplicative interaction term between the checks & balances index and each of the following six political competition variables: i) electoral competition in the State Assembly; ii) electoral competition in the House of Representatives; iii) number of parties in the governor's coalition; iv) margin of victory in the last election; v) lame duck governor; and vi) governor in the President's party.[19] Before presenting the aggregate results it is useful to examine some of the individual results so as to understand in the investigative technique. We will focus on whether the political competition variables have virtuous or predatory effects, and whether the interaction with checks & balances is a substitute or complement. Of the 36 interactions, we show just one graph due to space limitations and the rest we summarize in Table 8.[20]

Graph 1 shows the result from the interaction of checks & balances with the number of parties in the governor's coalition when the dependent variable is the increase in wealth of state deputies. The slope of the line is the estimated coefficient for each level of checks & balances. The dashed lines are the upper and lower bounds of the 95% confidence interval throughout the range of checks & balances. Whenever this interval contains the value zero, the estimated coefficient for that level of checks & balances can be considered to be statistically equal to zero. Note that for low levels of checks & balances the estimated coefficient is negative and statistically reliable, so that more parties in the coalition have the effect of reducing increases in the wealth of deputies over the political term. This is simply the result obtained in the previous section and it ascribes a virtuous effect to this type of political competition. Here the added value of the interactive effect is that we can see how the impact of coalition size varies as checks & balances varies. As checks and balances increase, the estimated coefficient becomes smaller (closer to zero). For values of checks and balances 0.39, the coefficient becomes statistically equal to zero indicating that for those points the political competition variable no longer affects the wealth of deputies. As shown in Table 5, 16 states in the 1999-2002 period and 15 in the 2003-2006 period are in the range below 0.39 where the coefficient is statistically significant. Because the number of parties in the coalition only affects the dependent variable in states with low checks & balances, the presumption is then that

[18] We adopt the graphical method for analyzing multiplicative interaction terms proposed by Brambor, Clark and Golder (2006). It displays all the information from the interaction of the variables, including the information needed for inferences.

[19] Given the size of the sample a separate regression was run for each multiplicative term, resulting in 36 regressions.

[20] The other graphs are available upon request.

these dimensions are substitutes. When states have well functioning checks & balances against opportunistic behavior by politicians, political competition is unnecessary.

[Graph 1 about here]

We summarize the results of the 36 regressions with interactive terms in Table 8. The six dependent variables form the column headings and the six political competition variables form the rows. Each cell provides six pieces of information. The first line shows if the political variable increases or decreases, *ceteris paribus*, the dependent variable. It also classifies this impact as virtuous (V) or predatory (P). Note that this classification depends not only on the sign of the estimated coefficients and whether the dependent variable is a public good, private good or personal benefit, but also on the relationship with political competition. Whereas the first three political variables increase political competition, the opposite is true of the last three. Being a lame duck governor or having won the last election by a larger margin are both instances of lower competition from the governor's point of view. The second line in the cell establishes whether the interaction between checks and balances and political competition is a substitute or a complement. The third line in the cell provides information on the range of checks and balances for which the interaction is statistically significant. The fourth line gives the confidence level used in the analysis. Finally the fifth cell lists the number of states in each period (1999-2002 and 2003-2006) for which the impact of the interaction was statistically significant.

[Table 8 about here]

We note that the same political variable can have both predatory and virtuous effects across different dependent variables. The number of parties in the governor's coalition, for example, has a virtuous effect in columns V and VI, reducing private goods and personal benefit, but a predatory effect in column III where it increases the primary deficit. Table 8 shows the incidence of results along the two dimensions predatory/virtuous and substitute/complement. It shows that in 14 of the 20 cases where we found an impact, political competition had a virtuous effect. Nevertheless there were five cases in which more competition implied a reduction in public goods or more private goods/personal gain. The nature of the interactions was also not homogenous, with 10 cases where checks and balances reinforced the impact of political competition (complement) and 9 where it mitigated that impact (substitute).

The varying impact of the political competition variables as well as the differing nature of their interaction with checks & balances, might seem disturbing to some readers, who would prefer a single overarching result ascribing the same impact and interaction across dependent variables, such as we found for checks & balances. However, our results for political competition simply reflect the fact that the different variables measure different aspects of political competition. Political competition encompasses several different attributes which are present in varying degrees in each of the variables we used. Some attributes capture issues related to the governor's time horizon, such as those predominant in the lame

duck variable and the margin of victory in the last election. Other attributes capture issues related to contestability and the existence of more or less veto players, such as the electoral competition variables. Yet another attribute that may permeate the political competition variables involves the issue of transaction costs in realizing political exchanges, as in the variable that measures the number of parties in the governor's coalition. Each of these attributes permeates, to a greater or lesser degree, each of the political competition variables, so that greater levels of political competition may have different effects on the dependent variable depending on which variable is involved. To see this, compare the expected impact of the lame duck variable and the variable measuring the margin of victory in the last election. Both a lame duck governor and one that has won the last election by an overwhelming majority are in a position of reduced competition, as the first cannot run for reelection and the second supposedly has a head start to win the next election. Nevertheless, the impact of this reduced competition can reasonably work in opposite directions. Whereas the lame duck governor has a short horizon and fewer electoral incentive to pursue good policies, the other has a longer horizon and may find it in her interest to pursue good policies. Our results are consistent with these expectations (see Table 8). The margin of victory variable was found to have a virtuous effect in two instances and the lame duck variable to have a predatory effect in two cases and a virtuous effect in one.[21] The fact that different political competition variables can have different effects and interactions simply reflects the variety of incentives contained in different variables. If, however, one had to classify each of the political competition variables as virtuous or predatory, then the conclusion would be that political competition is overwhelmingly virtuous, as five of the six variables had predominantly virtuous impacts on the public policy variables.[22] Only the margin of victory in the last election implies that more competition leads to more predatory public policies. In all other cases political competition is more often than not virtuous.

Conclusions

We modeled and tested the determinants of public polices at the state level in Brazil, in particular the decision by governors, to pursue public goods, private goods or their own personal wealth. Our overall finding is that checks & balances and political competition are the major determinants of the policy decisions of governors. Our empirical results show that better developed checks & balances have a strong impact on the choices of governors to increase public goods and restrict the provision of private goods and the pursuit of personal benefits. The results for political competition are not as clear cut, as different variables used to measure competition capture different attributes of the incentives faced by

[21] Note that in Table 8 the classification of virtuous or predatory considers the effect of an increase in political competition. Here we are referring to the effect of an increase in the margin of victory and to being a lame duck versus a first term governor, that is, an absence of competition, so that the classifications are reversed.

[22] This classification simply considers the frequency of the effect of a political competition variable (virtuous vs predatory) across the six dependent variables.

governors. Nevertheless, the evidence points to an overwhelming predominance of a virtuous impact of political competition on policy choice.

In addition to the direct effects of checks & balances and political competition, we analyzed whether there existed an interaction of these factors impacting the choices of governors. We analyzed whether the impact of political competition on the characteristics of the policies in a state is affected by level of checks & balances. Here the evidence was divided with approximately equal number of instances in which checks & balances augmented or mitigated the effect of political competition. Given that political competition was found to have an overwhelmingly virtuous effect, this means that greater levels of checks & balances are generally more desirable, as it will either amplify those effects, when the interaction is complementary, or act as a replacement when the interaction is a substitute.

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Table 1: Contestability versus Checks & Balances

		Contestability	
		High	Low
Checks & Balances	Low	Predatory Political Environment -politicians with short Political Horizons. Ex. Rondônia	Patrimonialist Entrepreneurial Politics Ex. Bahia
	High	Governance-enhancing Incentives- may produce policy volatility if preferences are polarized. Ex. Rio Grande do Sul	Governance-enhancing Incentives Ex. Minas Gerais

Table 2 – Dependent Variables

Num.	*Name*	*Description*	*Source*
1	Expenditure efficiency variation	The increase during the 4 year term of an index of expenditure efficiency that measures the ratio of final expenditures to 'input' or 'means' expenditures (e.g. administrative costs). Data for 1999-2002 and 2003-2004.	Ferreira Júnior, S. (2006).
2	Wealth variation- state assembly deputies.	Percent variation of state assembly deputies' declared wealth. Average for all deputies in the state for which there is information. Data for 1999-2002 and 2003-2006.	Rodrigues (2006) Políticos do Brasil.
3	Civil servant expenditures	Total expenditure with civil servants (salaries + benefits) as percent of total revenues in the state. (Average for 1999-2002 and 2003-2005)	IPEADATA.
4	Variation of expenditure on civil servants	The increase in expenditures on civil servants (%) from the average of the first two years in the electoral term to the second two years.	IPEADATA.
5	Primary Deficit	The difference between non-financial expenditures and non-financial revenues, divided by total revenues.	Ferreira Júnior, S. (2006)
6	Health& sanitation expenditures	Total health and sanitation expenditures divided by total expenditures. (average for 1999-2002 and 2003-2005)	IPEADATA.

Table 3 – Explanatory Variables

Num.	*Name*	*Description*	*Source*
1	Effective # of parties in House Representatives	Measure of political competition in the House of Representatives based on the number and size of parties. Data for 1999-2002 and 2003-2006.	Almanaque de Dados Eleitorais (Laboratório de Estudos Experimentais) http://www.ucam.edu.br/leex/
2	Effective # of parties in the State Assembly	Measure of political competition in the State Assembly based on the number and size of parties. Data 1999-2002 and 2003-2006.	Almanaque de Dados Eleitorais (Laboratório de Estudos Experimentais) http://www.ucam.edu.br/leex/
3	Index of Electoral competition House of Representatives	Measure of political competition in the House of Representatives based on the number of candidates per seat. Data for 1999-2002 and 2003-2006.	Almanaque de Dados Eleitorais (Laboratório de Estudos Experimentais) http://www.ucam.edu.br/leex/
4	Index of Electoral competition State Assembly	Measure of political competition in the State Assembly based on the number of candidates per seat. Data for 1999-2002 and 2003-2006.	Almanaque de Dados Eleitorais (Laboratório de Estudos Experimentais) http://www.ucam.edu.br/leex/
5	N^{o} of parties in Gov.'s coalition.	The number of parties in the governor's party coalition as registered at the Supreme Electoral Court. Data for 1999-2002 and 2003-2006.	Tribunal Superior Eleitoral www.tse.gov.br/internet/index.html
6	Margin of victory in gubernatorial election	Number of votes received by the first place in the gubernatorial election (first round) divided by the number of votes of the second place. Data for 1998 and 2002 elections.	IPEADATA http://www.ipeadata.gov.br/
7	Expected margin for reelected governors	Margin of victory in forthcoming gubernatorial election (see 6) times a dummy equal to 1 when the incumbent won that election. This variable captures the effect of governors who felt secure in office.	Constructed by authors.

8	Governor member of President's party	Dummy variable equal to 1 if the Governor of the state is a member of the President's party.	Tribunal Superior Eleitoral www.tse.gov.br/internet/index.html
9	Pork	Average value of individual and collective amendments executed across each legislature, divided by state GDP/1000. Averages for 1999-2002 and 2003-2006.	http://www2.camara.gov.br/
10	Education	Percent of the population over 15 years of age that is illiterate.	IPEADATA http://www.ipeadata.gov.br/
11	Gini	Gini index of income concentration.	IPEADATA http://www.ipeadata.gov.br/
12	GDPx per capita	State Gross Domestic Product divided by total population.	IPEADATA http://www.ipeadata.gov.br/

Table 4 – Variables used to Create the Checks & Balances Index

Num.	*Name*	*Description*	*Source*
1	Regulatory Agencies	Regulatory Governance Index. Measures governance of state and federal reg. agencies in Brazil based on survey data. States with no agency at the time of the study were set at 0.53 (avg. of other states). Data for 2004/2005.	Correa, Melo, Mueller and Pereira (2006).
2	Judiciary*	Index composed of three variables using principal component analysis: i) an efficiency index calculated through nonparametric efficiency frontiers; ii) ratio of number of cases tried over cases opened. iii) number of new cases opened per 100,000 inhabitants.	i) Swengberger, 2006, pg 79. ii) Ministério da Justiça. 2004. Diagnóstico do Poder Judiciário. iii) CNJ Indicadores Estat. da Justiça Estadual 2005, pg.278, 2004.
3	Public Prosecutors*	Index composed of three variables using principal component analysis: i) Expenditures on public prosecutors per resident; ii) Number of prosecutors per 100,000 residents. iii) Number of staff per 100,000 residents.	Sadek and Lima (2006).
4	Audit Office	An index of the level of activity in each state's Audit Office (TCE).	Melo and Pereira (2006).
5	National Justice Council (CNJ)	Number of procedures initiated in each state by the CNJ (agency that serves as a watchdog over the Judiciary) divided by state GDP (divided by 100,000). Data for 2006.	Corregedoria Nacional de Justiça. 2006
6	Media	Percent of all media concessions in each state not in the hands of politicians.	Santos, S. S. e Capparelli. 2005

7	Civic Community index	An index of Civic Community in the states constructed by principal component analysis using (i) voter turnout (1990-2006), (ii) *voto de legenda* (1990-2006), and (iii) nonprofit sectors workers per capita (ABONG-IBGE 2002 study).	Timothy Powers.

* Variables for which there is separate data for both periods 1999-2002 and 2003-2006.

Table 5 – Checks & balances Index.

Num	State	C&B Index 1999-2002	Num	State	C&B Index 2003-2006
1	Rio Grande do Sul	0.813	1	Rio Grande do Sul	1.000
2	Distrito Federal	0.775	2	Rio de Janeiro	0.728
3	Rio de Janeiro	0.684	3	São Paulo	0.684
4	Mato Grosso do Sul	0.619	4	Distrito Federal	0.671
5	São Paulo	0.569	5	Mato Grosso do Sul	0.585
6	Santa Catarina	0.555	6	Santa Catarina	0.545
7	Espírito Santo	0.530	7	Minas Gerais	0.519
8	Pernambuco	0.509	8	Espírito Santo	0.506
9	Rondônia	0.501	9	Pernambuco	0.483
10	Minas Gerais	0.426	10	Bahia	0.454
11	Bahia	0.414	11	Paraná	0.402
12	Mato Grosso	0.390	12	Goiás	0.400
13	Sergipe	0.389	13	Mato Grosso	0.377
14	Goiás	0.387	14	Sergipe	0.345
15	Paraná	0.378	15	Rondônia	0.318
16	Amazonas	0.299	16	Amazonas	0.315
17	Amapá	0.271	17	Ceará	0.258
18	Ceará	0.248	18	Amapá	0.247
19	Pará	0.227	19	Pará	0.242
20	Paraíba	0.207	20	Alagoas	0.183
21	Acre	0.198	21	Paraíba	0.161
22	Tocantins	0.189	22	Tocantins	0.159
23	Alagoas	0.186	23	Acre	0.146
24	Piauí	0.088	24	Piauí	0.059
25	Rio Grande do Norte	0.032	25	Roraima	0.049
26	Roraima	0.023	26	Maranhão	0.043
27	Maranhão	0.000	27	Rio Grande do Norte	0.029
	Mean	**0.367**		**Mean**	**0.367**
	Std. Dev.	**0.222**		**Std. Dev.**	**0.240**

Table 6 – Determinants of Governors' Choices

	(1) Civil Servant Expenditures (%)	(2) Variation of Civil Servant Expen. over electoral cycle	(3) Primary Deficit	(4) Health Expenditures (% of GDP)
Checks & Balances	-0.231**	-1.250*	-89.222**	0.010*
Index	(-2.39)	(-1.95)	(-2.26)	(1.91)
Checks & Balances			58.065*	
Index squared			(1.91)	
Initial level of Civil Servant		-7.352***		
Expend. (%)		(-3.24)		
Electoral competition in the State	0.069**	-0.097**		0.008*
Assembly	(2.63)	(-2.61)		(1.85)
Electoral competition in the State	-0.007**			
Assembly sqrd.	(-2.84)			
Electoral competition	-0.013		-3.584*	0.012***
House of Represent.	(-1.57)		(-1.92)	(3.20)
Effective number of parties in				0.003*
State Assembly				(2.09)
Number of parties in Governor's	0.001	-0.015*	0.445**	
coalition	(0.78)	(1.68)	(2.11)	
Margin of victory in last election	-0.004			0.004
(Gov.)	(-0.73)			(1.44)
Expected Margin of victory in next	-0.016***			
election	(-2.93)			
Governor in President's Party		-0.169**	3.935**	-0.018***
		(-2.33)	(2.37)	(-3.35)
Lame duck Governor	-0.015*	0.142**		-0.008*
	(1.73)	(2.11)		(-1.77)
Pork (%gdp/1000)				0.0002***
				(3.74)
Gini coefficient of wealth	8.693*			
concentration	(1.75)			
Gini squared	-7.984*			
	(-1.79)			
GDP per capita	-0.0548**	0.058		0.0.13
	(-2.36)	(0.49)		(1.45)

GDP			-0.0001***	
			(-3.39)	
Education			-1.249*	
			(1.87)	
Period			4.063	
			(1.54)	
Constant	-1.650	1.407**	87.458***	-0.077
	(-1.17)	(2.24)	(4.03)	(-1.67)
Method	Fixed Effects. 2 periods, 27 states	Fixed Effects. 2 periods, 27 states	Fixed Effects. 2 periods, 27 states	Fixed Effects. 2 periods, 27 states
Periods	1999-2002 2003-2006	1999-2002 2003-2006	1999-2002 2003-2006	1999-2002 2003-2006
Observations	54	54	54	54
R-squared (within)	0.75	0.51	0.63	0.85

Notes: In parentheses, t-stats. *** indicates significant at 1%, ** at 5%, and * at 10%.

Table 7 – Determinants of Politicians Wealth Variation and Expenditure Efficiency

	(1) Politicians' Wealth Variation	(2) Expenditure Efficiency
Checks & Balances	-8.385**	1.183**
Index	(-2.12)	(2.04)
Checks & Balances	6.359*	
Index squared	(0.102)	
Initial level of Expenditure Efficiency		-0.084
		(-1.27)
Initial level of Wealth	0.0000	
	(0.66)	
Electoral competition State Assembly	-0.284*	0.105**
	(-2.44)	(2.06)
Electoral competition		-0.225**
House of Represent.		(-2.38)
Effective number of parties in the House	0.436**	
	(2.50)	
Expected Margin of victory in next election	0.698***	
	(2.95)	
Number of Parties in Governor's coalition	-0.141**	
	(-2.18)	
Governor in President's Party		-0.160
		(-0.95)
Gini		3.505
		(1.35)
GDP per capita	0.113	-0.103*
	(0.53)	(-1.62)
Number of respondents/seat in Wealth variable	-2.599	
	(-1.31)	
Constant	4.34***	-1.343
		(-0.92)

	(2.89)	
Method	Random Effects -	Random Effects
	2 periods, 27 states	2 periods, 27 states
Periods	1999-2002	1999-2002
	2003-2006	2003-2006
Observations	54	54
Hausman test for random vs. fixed effects	$\chi^2(8)= 9.17$	$\chi^2(6)= 4.10$
	p-value = 0.3282	p-value = 0.6636
R-squared	R-sq: within = 0.4610	R-sq: within = 0.2310
	between = 0.2718	between = 0.3421
	overall = 0.3546	overall = 0.2803

Notes: In parentheses, t-stats. *** indicates significant at 1%, ** at 5% and * at 10%.

Graph 1 – Effect of Number of Parties in Gov's Coalition on Politicians' Wealth Variation

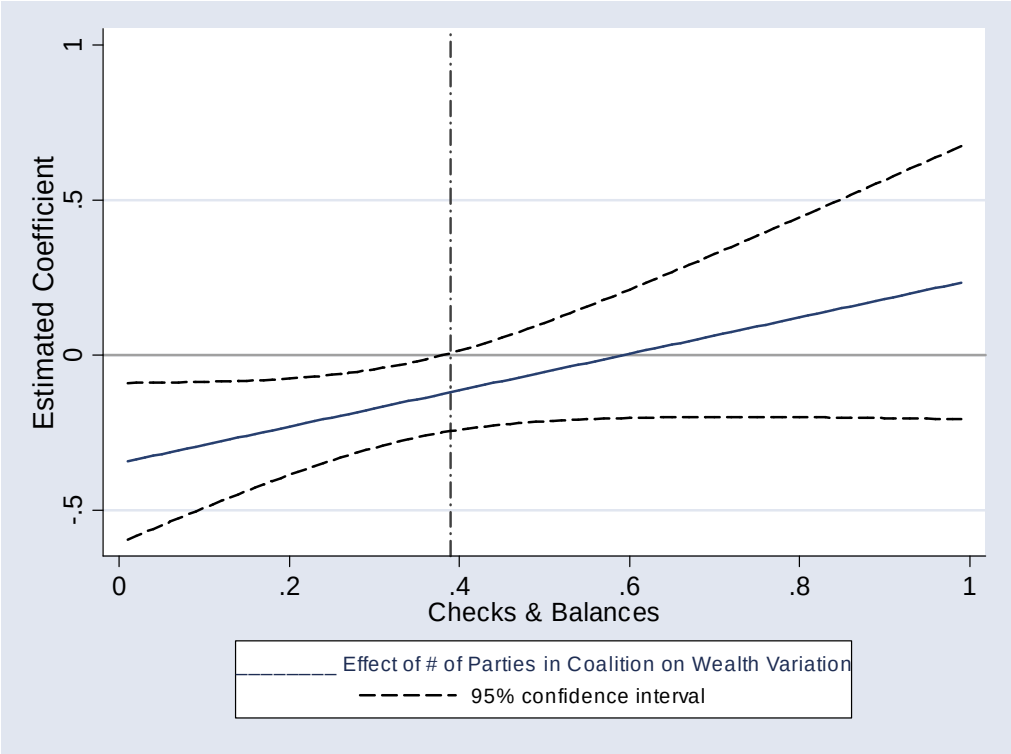

Table 8 – Interaction between Political Competition Variables and Checks & Balances

		I	II	III	IV	V	VI
Political Competition Variable	**Dependent Variable**	**Health Expend. (Public Good)**	**Expend. Efficiency (Public Good)**	**Primary Deficit (Public Good)**	**Civil Servant Expend. (Private Good)**	**Civil Servant Expend. Var. (Private Good)**	**Wealth Variation (Personal Benefit)**
Electoral competition in State Assembly	Variable's impact: Interaction with C&B: Significant range: Level of confidence: # states sig. each period:	+ (V) Complement 0.31 – 0.55 95% 10 / 11	+ (V) Substitute 0.00 - 0.38 95% 13 / 15	No impact	+ / - (P/V)[23] Comp. / Sub. 0.00 – 1.00 95% 27 / 27	- (V) Complement 0.04 – 0.38 95% 12 / 15	- (V) Substitute 0.00 – 0.38 95% 13 / 15
Electoral competition in House of Rep.	Variable's impact: Interaction with C&B: Significant range: Level of confidence: # states sig. each	+ (V) Complement 0.24 – 1.00 95% 17 / 17	- (P) Complement 0.24 – 0.64 95% 15 / 15	- (V) Complement 0.28 – 0.92 95% 25 / 26	- (V) Complement 0.47 – 0.76 95% 7 / 8	No impact	No impact

[23] In this case the explanatory variable enters the regression including a squared term so that its impact changes as the variable increases. At low values of electoral competition, the impact on civil service expenditures is positive, so that it has a predatory and complementary effect. At values close to the mean it has no impact. At higher values its impact is negative (virtuous) and it has a substitute interaction with C&B. The formulas for calculating the estimated coefficient and standard errors were modified to account for the quadratic effect. For the correct formulas in such cases see http://homepages.nyu.edu/~mrg217/interaction.html.

	period:						
Number of Parties in Gov's coalition	Variable's impact: Interaction with C&B: Significant range: Level of confidence: # states sig. each period:	No impact	No impact	+ (P) Complement 0.27 – 0.52 90% 10 / 10	No impact	- (V) Substitute 0.08 – 0.41 90% 14 / 13	- (V) Substitute 0.00 – 0.39 95% 16 / 15
Margin of victory in last election (Gov.)	Variable's impact Interaction with C&B: Significant range: Level of confidence: # states sig. each period:	+ (P) Substitute 0.16 – 0.34 90% 8 / 8	No impact	No impact	- (P) Substitute 0.04 – 0.22 90% 8 / 8	No impact	No impact
Lame duck Governor	Variable's impact: Interaction with C&B: Significant range: Level of confidence: # states sig. each period:	- (V) Substitute 0.20 – 0.33 90% 5 / 5	No impact	No impact	- (P) Complement 0.27 – 0.43 90% 8 / 6	+ (V) Complement 0.31 – 1.00 95% 15 - 16	No impact
Governor in President's Party	Variable's impact: Interaction with C&B: Significant range: Level of confidence:	- (V) Substitute 0.00 – 0.47 95% 18 / 18	- (V) Substitute 0.00 – 0.25 90% 10 / 10	+ (V) Complement 0.17 - 0.55 90% 18 / 15	No impact	No impact	No impact

	# states sig. each period:						

Code: + or – indicates whether the political competition variable has a positive or negative effect on the dependent variable. (V) or (P) indicates whether this is a virtuous or predatory effect. The second line in the result cells shows whether the interaction between political competition and checks and balances is substitute or complementary. The third line provides the range of checks and balances for which the estimated coefficient is statistically significant and the fifth line shows how many states are in that range for in each period 1999-2002 / 2003 – 2006. The fourth line shows the level of confidence used for inference. Note that the first three political competition variables are positively related to competition and the last three are negatively related and this information is already incorporated when labeling (V) or (P).

Appendix

Table A1 – Descriptive Statistics

Variable	Period	Obs.	Mean	Std. Dev.	Min.	Max.
GDP per capita	1999-2002	27	5.006	2.843	1.605	13.504
GDP per capita	2003-2006	27	5.171	2.696	1.728	12.406
Effective # of parties in the State Assembly	1999-2002	27	6.581	1.771	3.3	10.0
Effective # of parties in the State Assembly	2003-2006	27	8.026	2.034	5.2	12.5
Effective # of parties in the House of Represent.	1999-2002	27	4.656	1.393	2.5	7.4
Effective # of parties in the House of Represent.	2003-2006	27	5.359	1.652	3.2	9.5
Index of Electoral compet. House of Rep.	1999-2002	27	2.189	0.841	0.51	4.44
Index of Electoral compet. House of Rep.	2003-2006	27	3.284	1.085	0.72	5.69
Index of Electoral compet. State Assembly	1999-2002	27	3.909	2.158	1.58	11.92
Index of Electoral compet. State Assembly	2003-2006	27	4.684	2.283	1.82	12.1
Governor in President's party. (dummy)	1999-2002	27	0.296	0.465	0	1

Governor in President's party. (dummy)	2003-2006	27	0.111	0.320	0	1
# of parties in Gov.'s coalition.	1999-2002	27	8.111	3.994	1	16
# of parties in Gov.'s coalition.	2003-2006	27	7.259	3.789	1	14
Margin of victory in gubernatorial election	1998	27	1.849	1.161	1.01	5.01
Margin of victory in gubernatorial election	2002	27	1.459	0.363	1.012	2.512
Expenditure efficiency variation	1999-2002	27	0.298	0.702	-0.48	2.83
Expenditure efficiency variation	2003-2004	27	-0.051	0.176	-0.601	0.22
Expenditure efficiency in levels.	1999-2002	27	2.682	1.226	1.37	7.453
Expenditure efficiency in levels.	2003-2004	27	1.997	0.473	1.065	3.15
Education	1999-2006	27	14.786	8.267	5.178	31.238
Education	2003-2006	27	13.977	7.690	4.431	29.391
N^0 state deputies in wealth var. variable	1999-2002	27	16.444	8.803	5	40
N^0 state deputies in wealth var. variable	2003-2006	27	18.363	9.987	7	49
Pork per capita	1999-2002	27	56.931	131.583	0.36	675.15
Pork per capita	2003-2004	27	13.555	36.356	0	178.77
Wealth variation state assembly deputies	1999-2002	27	2.052	1.890	0.29	7.14

Wealth variation state assembly deputies	2003-2006	27	2.602	1.791	0.28	7.78
Wealth variation of a sample of all politicians	1999-2002	27	0.555	0.519	-0.247	1.474
Civil Servant Expenditures (% of revenues)	1999-2002	27	0.437	0.065	0.331	0.628
Civil Servant Expenditures (% of revenues)	2003-2006	27	0.425	0.062	0.274	0.530
Variation in Civil Servant Expenditures (% of rev.)	1999-2002	27	0.017	0.168	-0.260	0.449
Variation in Civil Servant Expenditures (% of rev.)	2003-2006	27	0.021	0.178	-0.470	0.440
Health Expenditures (% of Total Expen.)	1999-2002	27	0.116	0.041	0.051	0.219
Health Expenditures (% of Total Expen.)	2003-2006	27	0.141	0.037	0.082	0.245
Checks & Balances index	1999-2002	27	0.367	0.222	0	0.813
Checks & Balances index	2003-2006	27	0.367	0.240	0.029	1.00

Model Comparative Statistics

Let the level of checks & balances be denoted by θ, that of political competition by π, and the social/economic effects as ψ.

i) Productivity of effort in producing public goods: $P_u^{Eu}(E_u, \theta, \pi, \psi)$ – This function measures the amount of additional public good that materializes when a governor allocates a marginal unit of effort towards E_u. We explicitly note that it is affected by both θ and π. There is no theoretical reason for expecting the signs of these impacts to be either positive or negative. To see this consider, as an example, the impact of a change that increases the level of political competition faced by a governor. Depending on the circumstances, this change may lead to either more or less public good being produced from the marginal level of effort. Note that what is under consideration here is not how much effort the governor decides to dedicate to public goods but rather more narrowly the amount of public good that results from the marginal level of effort, whatever the optimal level of effort for public goods may be. Suppose for example that the increased level of political competition leads to a situation where the governor needs to bring additional parties into his coalition. Conceivably this may make the process of proposing, approving and implementing the legislation that generates the public good slower and more cumbersome as it requires more negotiation within the coalition. On the other hand it may be that the presence of these new parties in the coalition may provide more pressure for the public goods to be provided in a more timely and more effective manner. The point is that there is no reason to suppose that $\frac{\partial P_u^{E_u}}{\partial \pi}$ will necessarily have an unambiguous sign (the same being true for $\frac{\partial P_r^{E_r}}{\partial \pi}$.) In the same manner, improved checks & balances may either improve or depreciate the productivity of effort in producing public goods. This being the case, the net impact of π or θ on E_u, E_r, and α will be an empirical issue, which we will test in Section 3. Similar reasoning holds for the impact of θ on the dependent variables (see the example below).

ii) Productivity of effort in producing private good: $P_r^{E_r}(E_r, \theta, \pi, \psi)$ – This function is similar to that in (i), except that it involves the governor's productivity in producing private goods, that is, transfers to restricted groups. Here again, although intuition may point to a negative effect of θ and π, a positive effect is conceivable. Suppose, for example, an increase in the level of checks & balances. If the provision of private goods requires illegal or illegitimate means, such as rigging procurement contracts to assure certain firms are chosen, then an increase in θ will make those activities more difficult and will reduce the governor's productivity in providing those goods. However, in many instances providing private goods is

perfectly legal, as when governors decide to build infrastructure that benefits specific firms disproportionately. In such cases, better checks & balances may actually make the governor more productive by assuring that contracts and cooperation among the various agencies and organizations involved work more smoothly. The point, analogous to that made above, is that $\frac{\partial P_r^{E_r}}{\partial \theta}$ can be either positive or negative (the same being true for $\frac{\partial P_u^{E_u}}{\partial \theta}$.)

iii) The electoral response to public goods: $V^{P_u}(\cdot, \theta, \pi, \psi)$ – This function measures the reaction of voters to the provision by the governor of public goods. Here the most important factor may be ψ, as the education level of the electorate will typically affect how public goods translate into votes. Nevertheless, θ and π may also have an impact. More polarized electorates, for example may be less sensitive to public goods, as there are less central voters prone to switch their votes when confronted with increased public goods. Similarly checks & balances can affect the governors' ability to claim credit for the provision of public goods. One important component of checks & balances (which we explicitly include in our index below) is the control of media by politicians. A governor that owns the main newspaper and other communication outlets in a state can probably squeeze more votes from a given public good by better advertising the government's role in its provision. Here once again it is conceivable that the impacts of political competition and checks & balances may be either negative or positive.

iv) The electoral response to private goods: $V^{\Pr}(\cdot, \theta, \pi, \psi)$ – This function is similar to (iii) except that it involves the impact of private rather than public goods on voters. The governor has an incentive to provide private goods to interest groups. However, the policies that transmit those private goods are perceived by the voters and affect the way they vote. Generally we would expect that policies providing private goods would reduce the votes received by the governor, though that need not necessarily be so. A culture of '*rouba mas faz*' (approving politicians that steal but get things done), for example, would mitigate the negative impact of private good provision on votes received by the governor. Whatever the case, the governor will take into account the voters' preferences regarding the policies aimed at private groups. The same comments as in (iii) apply concerning the signs of the impacts of θ and π on electoral response.

v) The marginal utility of votes to the governor: $U^V(\cdot, \theta, \pi, \psi)$ – This function measures the value given by the governor to additional votes. Clearly the level of political competition, π, is an important determinant of this value. Governors in states with lower levels of contestability, dominated by their own political group, will attach a smaller value to marginal votes, that is, lower U^V. Similarly, if a governor is in the first or second term (lame duck) will affect how badly he needs more votes. Checks & balances may also affect the governor's utility from additional votes, and this impact, as before, may be either positive or

negative. A lower θ, for example, may imply a greater ability to rig ballots in certain areas, so that the governor will have less need for the authentic votes, which have to be obtained through public goods and costly campaign propaganda (thus a positive relation between θ and U^V). Alternatively, a higher θ makes it harder for a governor to appropriate public funds, and by making the spoils of office less attractive reduces the utility of additional votes. As before, the final word on the net impact of θ and π will be an empirical test.

vi) The productivity of private policies in generating resources: $R^{P_r}(\cdot, \theta, \pi, \psi)$ - An important element of the model is that governors are rewarded with resources for providing private goods. How much marginal resources a governor receives in exchange for additional private goods is clearly affected by all three parameters. Lower political competition may give the current governor greater monopoly power in the provision of public goods and thus induce a higher price to be paid. Checks & balances affect how easy or hard it will be to realize those transfers, which may be both legal and illegal. The level of education may have on impact on voter's perception of the legitimacy of campaign contributions. As before, though there are typically intuitive notions of the directions of all these impacts, they can conceivably go either way, and which will prevail, on average, will be an empirical issue.

vii) The voters sensitivity to electoral campaigns: $V^R(\cdot, \theta, \pi, \psi)$ – This function measures the electorate's sensitivity to campaign propaganda. This can be thought of as Denzau and Munger's (1986) continuum between rationally ignorant to 'civics class' voters. In states with more highly educated voters the same amount of resources used in the electoral campaign yield less votes (lower V^R). Both θ and π affect the amount and quality of information received by voters and can thus affect their response. Again the sign of the impact is indeterminate. For example, whereas some forms of political competition may lead to better information being provided to voters, other forms may degenerate into negative campaigning which confuse and repulse voters.

viii) The marginal utility of money in pocket (rather than in the campaign) for the governor $U^M(\cdot, \theta, \pi, \psi)$ – A marginal unit of money appropriated by the governor provides him with additional utility, however the size of this increase depends on all three parameters. Better checks & balances, for example, may reduce the marginal utility of money if detection and prosecution become more probable with a higher θ. On the other hand better checks & balances may make money more valuable as resources may be necessary to defend oneself against prosecution once out of office, when immunity expires. Similarly, more political competition may make money more or less valuable, depending whether the strategy against competitors relies primarily on higher campaign resources (e.g. more propaganda) or on tactics that rely instead on other instruments (e.g. bribes).

It is possible to perform comparative static analysis on the equilibrium conditions in equations (2), (3) and (4), in order to get an expression that shows how each of the dependent variables, E_u, E_r and α are

affected by changes in the parameters θ, π, and ψ, which is the objective of the paper. However, because this involves a system of four dependent variables (including λ) in which the parameters appear in many different places and without predetermined signs for the impact of these parameters on the various functions involved, the signs of the expressions for $\frac{\partial E_u}{\partial \kappa}$, $\frac{\partial E_r}{\partial \kappa}$ and $\frac{\partial \alpha}{\partial \kappa}$, $\forall \kappa = \theta, \pi,$ and ψ, are all ambiguous and no clear prediction can be made.