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Barry Ames

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*Electoral Strategy under Open-List Proportional Representation**

Barry Ames, *Washington University*

Theory: This paper develops a theory of candidate strategy from social-choice principles and from the workings of open-list proportional representation. The theory is used to explain the campaign behavior and the spatial patterns of vote distribution for candidates to the Brazilian Chamber of Deputies.

Hypotheses: Campaign strategy is evaluated with models that predict where deputies will offer budget amendments to benefit target municipalities whose votes they seek in subsequent elections. The choice of target municipalities is a function of the cost of erecting barriers to entry, the dominance of the deputy in the municipality, the spatial concentration of the deputy's statewide vote, the vulnerability of the municipality to invasion by outsiders, the weakness of the deputy in the last election, and the deputy's prior political career.

Methods: Logistic regression of amendments to the Brazilian national budget in 1989 and 1990 and OLS regression of municipal-level electoral results for the Brazilian Chamber of Deputies in the 1990 elections.

Results: Deputies seek secure bailiwicks, search for vulnerable municipalities, and strive to overcome their own electoral weakness by delivering pork. Candidates' tactics vary, partly because political backgrounds differ and partly because the differing demographic and economic contexts of Brazilian states reward some tactics and penalize others. Candidate behavior hinders voter control over deputies, increases incentives for pork seeking, and weakens party programs and discipline.

Latin America in the mid-1990s is a region of optimism. Fledgling democracies survive; economies stabilize and grow. But Brazil remains an enigma. While prices rise 30% per month and the distribution of income deteriorates, the legislature stalls attempts at stabilization until the executive provides low-level jobs for party faithful. Unprecedented corruption leads the Congress to remove the first popularly elected president in 30 years; within a year a new corruption scandal shakes the Congress itself.

Increasingly, observers blame Brazil's political institutions. Consider the party system and the legislature. Even by Latin American

*The data utilized in this article will be deposited at the ICPSR by the end of 1995. Scholars interested in the data before that date may contact the author. This research has been supported by the National Science Foundation, Washington University, St. Louis, and IRIS—Institutional Reform and the Informal Sector, at the University of Maryland, College Park.

standards, Brazil's party system is weak (Mainwaring and Scully 1992). Few parties have genuine roots in society. Party vote-shares are volatile over time and between presidential and legislative elections. In the Congress, party leaders exert little control over their delegations. Many if not most deputies spend the bulk of their time arranging jobs and pork-barrel projects for their benefactors and constituents. Though electorally successful parties span a wide ideological range, some of the largest "center" parties are really just shells for deputies with no policy interests at all. Few parties organize around national-level questions; the Congress, as a result, seldom grapples with serious social and economic issues.

Brazil's presidents benefit little from the weakness of the Congress. With only minimal chances to obtain stable legislative support, executives face independent governors, an electoral calendar imposing elections in three of every five years, municipalities depending for their very survival on federal largesse, and a substantial core of deputies who value their own incomes first, reelection second, and public policy a distant third. Presidents govern by forming coalitions based upon cabinet appointments. Because these appointments must satisfy both party and regional demands, cabinets tend to be very inclusive (Abranches 1988). The pork-barrel programs required to maintain them are costly, and policy innovation is extremely difficult.

At the core of Brazil's institutional crisis lies the electoral system. A unique set of rules, usually referred to as "open-list proportional representation," governs legislative elections. Scholars have explored Brazil's version of open-list proportional representation, but the absence of appropriate data has limited research both in scope and depth.¹ (See De Souza and Lamounier 1992; Fleischer 1973, 1976, 1977; Kinzo 1987; Lima Junior 1991; and Mainwaring 1993.)

In sum, the consolidation of democracy in Brazil may well depend on our understanding of the relationship between institutional structures, especially the electoral system, and the problems of the legislature and the executive. This paper examines elections for the Chamber of Deputies. I focus on the consequences of Brazil's version of open-list proportional representation for individual campaign strategies and for the types of deputies winning legislative seats, and I explore the ways in which campaign strategies operate in states with differing social and economic characteristics. The exposition begins with a sketch of the electoral system and a taxonomy of spatial vote patterns. I then offer a

¹No multi-state studies have been undertaken, probably due to a scarcity of municipal-level voting data, an absence of digitized municipal maps, and unfamiliarity with spatial statistical techniques.

theory explaining the strategies adopted by individual Chamber candidates. The theory is based on notions of strategy developed in the social-choice literature and adapted to Brazil's political and social context. A test of the theory requires a measure of deputies' *intentions*. I utilize budgetary amendments: deputies submit amendments to benefit localities where they seek to reward allies and recruit new supporters. Thus the empirical analysis begins with a model predicting the chance that a given deputy will offer a budgetary amendment benefitting a particular municipality. I then test the efficacy of candidate strategies by modeling individual deputies' vote totals in the 1990 legislative election. In the conclusion I stress three broad consequences of deputies' strategic behavior: the loosening of the principal-agent tie between voters and deputies, the magnifying of incentives for pork-seeking, and the weakening of party programs and discipline.

1. The Brazilian Electoral System

In elections for the national Chamber of Deputies, each Brazilian state is a single, at-large, multimember district. The number of seats per state ranges from eight to 70. Lightly populated states are overrepresented; heavily populated states, principally São Paulo, are underrepresented. Electoral laws allow unlimited reelection, and parties cannot refuse to renominate incumbents. Voters cast single ballots either for the party label—in which case their vote merely adds to the party's total—or for individual candidates. Most opt for individuals. Candidate names appear nowhere on the ballot; rather, the voter must write in the candidate's name or code. The D'Hondt method determines how many seats each party earns; the individual ordering of votes then establishes which candidates receive those seats.²

Other nations, including Finland and pre-1973 Chile, have adopted open-list proportional representation, but Brazil's version differs in two ways: in Brazil state parties, not national parties, select legislative candidates, and the voting district (the state) is an important political arena in its own right. In some states, powerful governors control nominations and dominate campaigns; in others local leaders deliver blocs of votes to deal-making candidates; in still others neither governors nor local bosses have much influence over individual votes.³

²Until 1994, parties faced no minimum threshold for attaining seats in the legislature. In 1993, Congress approved a 3% threshold, but a loophole will minimize the law's effects.

³The strongest state machines are probably those of Maranhão and Bahia, both in the Northeast. While governor, Orestes Quércia dominated the PMDB in São Paulo, and he maintained much of that power during the administration of his hand-picked successor. Powerful local leaders are found mostly in less industrial areas.

Brazilian campaign regulations are both restrictive and permissive. Candidates may not, for example, buy advertisements on radio or television. Most candidates advertise in newspapers, but print ads have little impact (Straubhaar 1993). Candidates erect billboards and paint signs on walls, but they generally do so in conjunction with other campaign efforts, such as participation in rallies or delivery of public works to local leaders. Permissive spending laws allow candidates for the federal legislature to finance the campaigns of state assembly candidates. Because state assembly districts are also whole states, elected at large, politicians engage in *dobradinhas*, or double-ups, in which federal legislative candidates pay for the campaign literature of assembly candidates whose bases of support lie far away. The assembly candidates reciprocate by instructing supporters to vote for their benefactor for the national legislature. Such deals add little, of course, to linkages between representatives and their constituents.

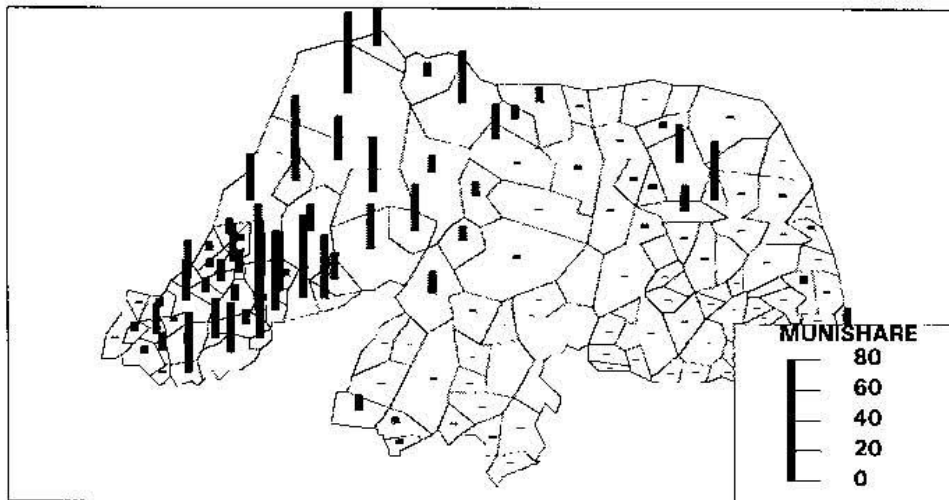
A Taxonomy of Spatial Patterns

Legally, candidates seek votes everywhere in their states, but in reality most limit their campaigns geographically. The spatial patterns that result have two dimensions at the state level, each based on *municipal* performance. Suppose, for every candidate in each municipality, we calculate V_{ix} , candidate i 's share of all the votes cast in municipality x . We define each candidate's *municipal dominance* as the candidate's share of the total votes cast for members of all parties. These shares represent the candidates' dominance at the municipal level.⁴ Now suppose we use V_{ix} to calculate D_i , the average dominance for each candidate across all the state's municipalities, weighted by the percentage of the candidate's total vote each municipality contributes. Candidates with higher weighted averages tend to dominate their key municipalities; those with lower weighted averages share their key municipalities with other candidates. Thus "dominance-sharedness" is the first dimension of spatial support.

The second dimension also begins with V_{ix} , candidate i 's share of the total vote cast in each municipality, but this dimension assesses the *spatial* distribution of those municipalities where the candidate does well. These municipalities can be concentrated, as close or contiguous neighbors, or they can be scattered. Combining the two dimensions yields four spatial patterns:

⁴Note that municipal dominance has nothing to do with actually winning seats; whole states, not municipalities, are electoral districts. I have also experimented with conceptualizing dominance solely in terms of votes for candidates of the candidates' own party.

Figure 1. A Concentrated-Dominant Vote Distribution: Municipal Vote Share of Laire Rosado Maia, PMDB-RN

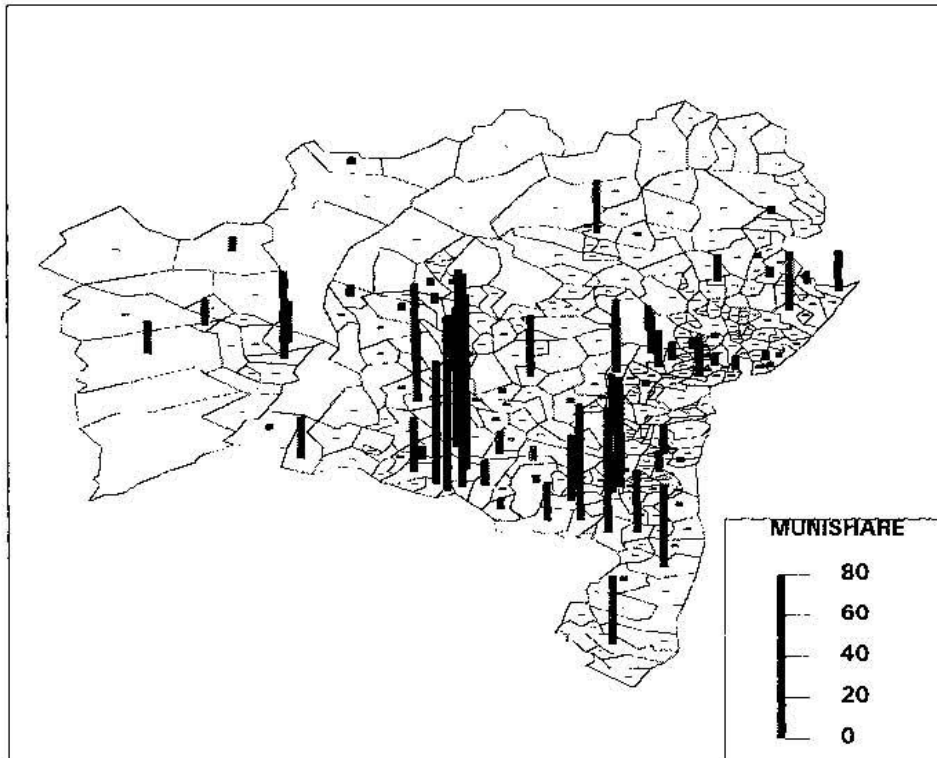


Concentrated-dominated municipalities. This is the classic Brazilian “*reduto*” (literally, “electoral fortress”), where a deputy dominates a group of contiguous municipalities. Candidates’ families may have traditions of power in the region; they might climb the ladder of politics from local jobs; they may strike deals with local bosses. Figure 1, mapping the 1990 vote of Deputy Laire Rosado Maia, illustrates extreme concentration.⁵ Rosado Maia received nearly all his votes in the Elephant’s Trunk, the western section of Rio Grande do Norte. Maias have long controlled the West—one county even carries the family name. Note that where Rosado Maia received votes, he averaged at least 50% of all votes cast. So not only does Rosado Maia receive all his votes in this region, other candidates rarely dare to compete in his impermeable *reduto*.

Concentrated-shared municipalities. In large metropolitan areas such as greater São Paulo, a particular cohort of voters may be sufficient to elect many candidates. Working-class candidates, for example, often get three-fourths of their total statewide vote from one municipality, the city of São Paulo. But they might never receive more than 5% of the votes cast in the city or in any other county, because they share these municipalities with many other candidates.

⁵The Appendix discusses the construction of the map as well as other data problems.

Figure 2. A Scattered-Dominant Vote Distribution: Municipal Vote Share of João Alves, PFL-Bahia



Scattered-shared municipalities. Some candidates appeal to voter cohorts providing support that is numerically weak in any single municipality. Two common examples are Japanese-Brazilians and *evangélicos*, Protestants who typically vote for evangelical candidates. These cohorts are cohesive and loyal, but they are not very large, so candidates relying on such voters construct coalitions composed of small slices of many municipalities.⁶

Scattered-dominated municipalities. This pattern fits candidates who once held such state-level bureaucratic posts as secretary of education, a job with substantial pork-barrel potential. The pattern is also typical of candidates who make deals with local leaders. Figure 2 pre-

⁶For graphic illustrations of the scattered-shared and concentrated-shared patterns, see my "Electoral Rules, Constituency Pressures, and Pork Barrel: Bases of Voting in the Brazilian Legislature" (1995).

sents the 1990 vote of João Alves, an old-time Bahian politician. Alves' voting strength was scattered over the state, but he received many votes in those locations. He garnered 70–80% of the vote in such dispersed municipalities by making deals wherever he found willing local bosses. He delivered pork; the bosses paid off in votes. Alves chaired the congressional Budget Committee. In 1993 congressional investigators accused him of receiving tens of millions of dollars in kickbacks from construction companies. João Alves came to the Congress in 1966 with no money; by the early 1990s he had millions of dollars in real estate and a \$6 million airplane.⁷

2. A Theory of Candidate Strategy under Open-List Proportional Representation

Optimal campaign strategies differ sharply between proportional and majoritarian electoral systems. Because small slices of the electorate may ensure victory in proportional elections, office-seekers pursue not the median voter but discrete voter cohorts (Cox 1990). How candidates define these cohorts depends, of course, on the size of potential targets and on the total votes required for election. Strategies also depend on the cost of campaigning as candidates move away from core supporters, the existence of local leaders seeking patronage, the spatial concentration of candidates' earlier political careers, and the simultaneity of elections for other levels of government.

How Candidates Calculate the Costs and Benefits of Appeals to Voters

Candidates know roughly how many votes guarantee a seat in their state's congressional delegation. This minimum depends on expected turnout and on the number of votes taken by the most popular candidates in their party.⁸ Given a vote target, candidates imagine a variety of ways to construct winning coalitions. Their strategic calculations center on the costs and benefits of appeals to any potential group. This section examines some principles affecting candidate calculations under Brazil's electoral rules. These principles operate nationwide, i.e., with-

⁷Alves commanded a group of deputies known, due to their stature, as the Seven Dwarfs. The Chamber's internal investigating committee accused almost all of extorting and accepting kickbacks, but the full Chamber exonerated some. Nearly all have the same vote distribution: scattered pockets of very intense support.

⁸The votes of leading candidates may far outweigh laggards, but since the number of candidates elected is in direct proportion to the party's cumulative share of all votes cast, popular candidates make possible the election of those with far fewer votes.

out reference to subnational contexts. Subsequently, I consider aspects of Brazilian politics that vary across states.

Voters as members of politicized groups. A rational candidate seeks to expend the least resources for the most support. The ideal target is a self-conscious member of a large group carrying a politicized identification or grievance. Japanese-Brazilians, for example, always understand their ethnicity, and evangelical Protestants know they are not Catholics. Evangelicals, however, are more likely than Japanese-Brazilians to see themselves as victims; hence the evangelical vote is more unified. In both cases, outsiders see the cleavage less intensely, so candidates can win evangelicals without losing all the Catholics.

At the other extreme, in terms of the permanence and politicization of identifications, lie occupational groups. For industrial workers, class-consciousness depends on the nature of the production process, wages, and labor organization. Workers in small factories, especially in the informal sector, tend to be younger, less-skilled, more-recent arrivals in the city, and more deferential toward owners. Such workers support candidates offering particularistic benefits over candidates promising social reform.⁹

Community identification, especially in small communities, falls closer to the automatic side. Local politicians try to strengthen community identification, because their own influence depends on delivering voters to candidates. The centrality of government jobs facilitates voter mobilization in small communities, and the restriction of civil-service protection to low-level positions politicizes public-sector posts. Because elections for local executive posts and for legislatures are staggered, local officials know they will be on the job both before and after legislative elections, so they are encouraged to make deals with legislative candidates.

The difficulty of securing benefits for the group. Deputies seek support for their campaign promises in the legislature. They opt for geographically separable goods, for pork-barrel programs, when the decisional system is fragmented and the demand for public goods is strong, relatively stable and district-specific (Lowi 1964; Salisbury and Heinz 1970). Brazil is characterized by powerful states acting in their own interests, selection of congressional candidates at the state level, municipalities independently electing local governments, weak national party

⁹Paulo Maluf, a conservative populist politician, could not carry the state of São Paulo in the 1989 presidential election, but he won the mayoral contest of São Paulo city in 1992 precisely with the votes of such workers.

leaderships, and separation of powers between the president and the federal legislature. In addition, enormous regional inequalities leave some municipalities so poor that government employment and subsidies are crucial sources of income. Thus Brazilian politics favors the provision of local, geographically separable benefits.

The costs and benefits of barriers to entry. Deputies seek to insulate voter cohorts from the incursions of competitors because they know that barriers to entry, by eliminating competition, reduce the cost of campaigns. The difficulty of erecting barriers depends on the nature of the group to be shielded. Wage hikes, for example, require broad legislative coalitions, so it is difficult for anyone to claim exclusive credit. Barriers against ethnic outsiders, by contrast, are essentially automatic, but they are more costly to erect against insiders such as other ethnics.

Is it hard to erect barriers around particular localities? A simple "you're not from around here" shields a small, highly integrated community. Violence, in the form of disruption of campaign rallies or physical threats, is routine in rural areas. More diverse communities develop factional competition, with each side relying on strongly partisan supporters. In complex urban areas no single faction or leader controls a significant portion of the electorate, and the police are not beholden to individual politicians. Many candidates seek votes, and barriers to outsiders from any party are hard to maintain.

Suppose a broker controls access to a group of voters. This control stems from some combination of coercion and prior delivery of employment or services. Deputies seeking brokers' votes offer cash or a slice of the benefit secured, such as a road-building contract. If the broker successfully erects rigid barriers against the entry of other brokers, candidates will pay more for the broker's votes than the sum of the prices they would pay for each vote individually. If, by contrast, the broker cannot protect his turf, candidates pay a lower total price for these votes than their individual prices. Whatever the price and form of payment, brokers' fees require candidates to secure *separable* resources.

The Cost of Communicating with Potential Voters

Brazilian campaigning is a direct, grassroots activity.¹⁰ Candidates visit small communities, holding meetings and rallies. Is it rational to

¹⁰Media access remains central to campaigning even though candidates cannot buy radio or TV time. Because radio and newspapers in Brazil are generally partisan, media connections provide an effective barrier to competition as well as a means of communicating with voters. In recent years many broadcasters, popular as a result of call-in shows, have become candidates.

campaign where one's message reaches few voters? Indeed it is. First, the more concentrated the target group, the lower the cost of constructing a winning coalition. Second, electoral coalitions that cover small areas are likely to be locational, i.e., based purely on community identification. While in theory locational and nonlocational criteria might match perfectly (all southerners are black, all northerners are white), few such cases exist in Brazil. Thus the physical distance between a candidate and the last voter, the voter whose support assures victory, is nearly always smallest for locational coalitions.¹¹

The supply of politicians. Candidates' career trajectories constrain their campaign strategies and vote patterns. Local candidates, i.e., former mayors or city council members, should always be plentiful.¹² Except for those whose careers are rooted in large metropolitan areas, local candidates naturally develop *concentrated* distributions, because their name recognition decreases with the distance from their local job. What happens when candidates appear with backgrounds in state bureaucracy, or with no political history? Not a simple question, because at any given election the mix of careers among candidates depends on two sets of factors. One set (which may be called *endogenous*) depends on the context of the election itself, in the sense that new candidacies depend on the initial distribution of *incumbent* candidates. For example, where transportation costs are high, where statewide name recognition is low, where concentrations of workers or ethnics are weak, and where voters prefer candidates with municipal political experience, only local types will offer themselves. But the career mixes of candidates also depend on a second set of factors, *exogenous* in the sense that new candidacies respond to the opportunities and rewards of legislative activity. People with different backgrounds become candidates because they seek personal rewards from legislative activity.

My argument is simple: in campaigning, what you did affects what you do. For many local candidates, a run for the federal legislature is the first statewide political activity. Because locals begin with a single name-recognition peak, a *concentrated* campaign is the obvious choice. But suppose the candidate headed a government department that man-

¹¹The exceptions include winning electoral coalitions based on class voting in the cities of Rio de Janeiro or São Paulo.

¹²Mayors must pursue another office, since they cannot seek immediate reelection. Federal deputy, however, is not necessarily a step up: in 1992 about one-fifth of all federal deputies went the other way, running for mayor. Local office holders are abundant as candidates except in frontier states, which develop so fast that local politics tends to be extremely weak. Frontier municipalities depend on state and federal largesse, and politicians often "parachute" in to pick up votes.

aged roads or schools. Surely bureaucrats considering a political career would locate projects to their political advantage, and such candidates would become well known in the communities benefitting from their largesse. Thus the voting support of such candidates should be *scattered* rather than concentrated. Whether they will dominate or share municipalities depends on the target municipality and on the program they directed. In rural communities, domination can result, either because a single program affects many people intensely or because the program may be designed to buy the support of local influentials rather than individual voters.¹³ Urban communities absorb multiple programs—often directed by competing politicians—and voters are less easily controlled. Finally, suppose the candidate's career is in business. Business people may begin with some central recognition peak around the location of their business, but such peaks are seldom as large as those of local politicians. Their advantage is money: T-shirts, pressure cookers (bottom half before the election, top half after), and political jobs for voters. Money buys the political bosses who control voters, and money greases the *dobradinhas* between state assembly and federal Chamber candidates. For business types, then, scattered support results: the strategic business candidate buys support wherever available.

At this point let us distinguish between challengers and incumbents. Suppose a local politician challenges the incumbent in a concentrated-dominant bailiwick. Superficially, the challenge resembles a contest over an occupied seat in the U.S. House of Representatives, but it is actually more difficult. Local bailiwicks are usually sparsely populated. If the challenger picks up only 51% of the incumbent's vote, the confrontation leads to mutual defeat. Since pork matters more than national policy, neither local bosses nor individual voters want to replace a deputy who has delivered. Local vs. local contests, therefore, are so difficult they rarely occur.¹⁴ Unless the incumbent neglects the district or angers the local boss, local challengers should await a retirement.

¹³A road, for example, may be intended to enrich a particular contractor or big farmer.

¹⁴In the 1990 election, the governor of São Paulo, Orestes Quércia, supported a challenge to a deputy who had previously been a member of Quércia's PMDB but had defected to the PSDB. Quércia's well-financed challenger won, but so did his target. For a broader test, consider the 1990 election in Paraná. Of the state's 30 congressional seats, non-incumbents won 24. Of these 24, 12 won with concentrated, local bailiwicks. Of the 12, 6 constructed bailiwicks where none had previously existed. Four essentially assumed the districts of incumbents who did not run. Only two took over the bailiwicks of incumbents who did compete. In one case the challenger constructed a much bigger bailiwick; in the other the challenger benefitted from the state's swing to the right, defeating two incumbents who had shared the same area.

What should we expect from local incumbents themselves? Given the infrequency of direct challenges within their bailiwicks, locals mainly fear a drop in the aggregate party vote. Were it to decline sufficiently, the same postelection rank might no longer guarantee a seat. Thus local incumbents have to fish for new voters either in the bailiwicks of party colleagues or in the bailiwicks of incumbents from other parties. Party identification in Brazil is weak, so deputies easily attract supporters of other parties. Since proportional representation rewards higher party totals with additional seats, party leaders discourage poaching in the bailiwicks of party allies. In sum, Brazilian candidates should forage for votes in *unfriendly* territory. And since shared municipalities are more vulnerable than dominated municipalities, domination as well as concentration should decrease for local candidates.

Changes in spatial concentration also occur among nonlocal candidates. The core constituencies of candidates relying on scattered distributions—evangelicals, broadcasters and state bureaucrats—are relatively stable in size, so such candidates need new followers. Since some of the pork these deputies deliver to their core supporters benefits others in the same municipalities, and since deputies save resources by remaining near their core support, their spatial concentration should increase.

Businessmen initially buy votes with payoffs to local bosses, but once in the legislature they are likely to seek more popular backing to fill in between areas of strength. Concentration among successful business candidates *rises*. Greater concentration, however, may not produce greater electoral success. The electoral support of business candidates is more fickle than the support enjoyed by local politicians. Better offers sway bosses loyal to the highest bidder. Thus businessmen face contradictory incentives. While opportunities are clearly better for candidates unconstrained by local careers, businessmen can lose support as quickly as they gain it. Business will supply many new candidates, but business incumbents will be more vulnerable to electoral defeat than candidates with other career trajectories.

3. Analysis

The broad outlines of the argument should stand or fall on empirical grounds.¹⁵ Analysis begins with a model of campaign strategy that uses

¹⁵ Given the considerable continuity between the last legislative elections of the dictatorship and those of the New Republic, there are no campaigns without incumbents. In addition, the availability of results for only four elections leaves open the stability of the system.

budgetary amendments as indicators of candidate intent. The following section incorporates budgetary amendments in a model of actual electoral outcomes.

Campaign Strategy in the 1990 Election

Deputies submit budgetary amendments to retain old followers and attract new ones. Congress did not regain the constitutional right to modify the national budget until 1988, but deputies learned quickly. Between 1989 and 1992, the annual number of budgetary amendments climbed from 8,000 to 72,000, with over 90% targetting specific municipalities. The model assesses, for each municipality, the probability that a deputy running for reelection will submit a budgetary amendment.¹⁶ Specifically, the probability that a deputy running for reelection in 1990 offered an amendment in 1989 or 1990 targetting municipality X is a function of six factors: (1) the distance of X from the center of the deputy's 1986 vote; (2) the dominance and concentration of the deputy's 1986 vote; (3) the vulnerability of municipality X to candidate invasion; (4) the socioeconomic and demographic similarity of X to the deputy's core constituency; (5) the deputy's electoral insecurity; and (6) the deputy's career trajectory.

Distance from 1986 vote center. The 1986 "vote center" of each incumbent deputy is measured in two ways.¹⁷ *Municipal center*, C_m , is based on municipal domination, the percentage of each municipality's total vote received by deputy i . *Personal center*, C_p , is based on personal share, the percentage of deputy i 's statewide total received in each municipality. I then calculate the distance from C_m and C_p to every municipality in the state. As municipalities become more distant, name recognition declines and the cost of campaigning increases; distant municipalities are less likely to be targets for deputy i . At the same time, deputies with personal vote centers in municipalities where they do not also dominate (typically big cities) are likely to make amendments fur-

¹⁶Budgetary amendments are obviously not the only tactic deputies utilize. They visit large numbers of municipalities, holding rallies and offering support to candidates for other offices. Budget amendments are thus a proxy for a range of campaign activities. For this reason, my analysis focuses on amendments *offered* rather than amendments actually *approved* by the budget committee. The budget committee's actions represent a *legislative* decision process, a process I treat in a work in progress.

¹⁷The center is the centroid of a plane surface in which a municipality's votes are assumed to be cast at its center. Note that C_m and C_p are not necessarily at the actual physical center of any particular municipality. The *socioeconomic* centers in the social-match section, however, are indeed individual municipalities.

ther from their personal centers, because they share the central municipality with so many other candidates that credit claiming is hopeless.¹⁸

Dominance and concentration. Earlier, I defined dominance and concentration as characteristics of individual deputies measured at the level of the state as whole. Dominance, however, is also meaningful at the municipal level. A deputy could dominate minor municipalities, for example, but share large municipalities with others. Only municipal-level dominance should affect amending.¹⁹ The higher the level of dominance in a given municipality, the more the deputy can claim credit for pork-barrel efforts, and, therefore, the more budgetary amendments he or she will offer. When dominance reaches very high levels, the deputy has a "safe seat" (as in the old one-party American South); hence amendments should decline.

Candidates with concentrated 1986 voting support should make more amendments, because they are vulnerable to the incursions of candidates with bureaucratic or business backgrounds. Concentrated candidates move out from their original bases in roughly concentric circles. They must be less selective than candidates with scattered votes, because they choose targets not just on the criterion of vulnerability but also on the criterion of nearness to their own core. As a result, concentrated candidates "over-amend."²⁰

Municipal vulnerability. In municipalities dominated by strong incumbents seeking reelection, challengers have little incentive to invade. But conditions change; municipalities become permeable. A dominant deputy retires, leaving an electoral void. An influx of migrants signals an electorate free from control by old leaders and old loyalties. Invasion is encouraged by municipal fragmentation, either in the sense that many candidates from a single party share votes or in the sense that candidates from many parties enjoy electoral success.²⁰

Social match. If incumbents identify certain occupational or ethnic groups as key supporters, they should target new municipalities where

¹⁸For a treatment of the effect of voter distance from candidates' home media markets, see Bowler et al. 1992.

¹⁹If *state-level* dominance has any effect at the level of the individual municipality, it must be true that deputies whose support comes mostly from municipalities they dominate are likely to make more amendments even in municipalities they only share. That is, dominant deputies' pork-barrel habit makes them behave irrationally.

²⁰*Interparty* fragmentation is defined as 1 minus the sum of the square of each party's share of the total vote. *Intraparty* fragmentation is defined equivalently at the level of the individual candidate, i.e., 1 minus the sum of the squares of each candidate's share of the party total.

similar groups reside. Deputies relying on working-class votes would seek industrial municipalities. Deputies appealing to civil servants should carry that appeal to localities where government is large. Thus deputies pursue new targets similar in socioeconomic composition to old bailiwicks. I begin by defining, on the basis of personal vote-share and municipal dominance, each deputy's core municipality.²¹ Then I calculate the difference between each municipality and the core municipality on three socioeconomic indicators: size of electorate, per capita income, and percentage of work force employed by government. The first two indicators reflect the possibility of class-based vote seeking, while the third represents a well-organized interest. Given the general weakness in Brazil of appeals to social class, government employees are the most likely target. For each indicator, municipalities more like the deputy's core municipality should receive more amendments.²²

Electoral insecurity. We know that individual votes largely determine deputies' electoral fortunes. Those whose 1986 rank was low, who barely escaped elimination, will work harder in the next election. Their overall number of amendments will increase.

Career trajectory. Because politicians with local backgrounds are more likely to maintain close ties with constituents than are politicians with bureaucratic or business backgrounds, local candidates should amend more. Locals should also concentrate their campaigns, including their budgetary amendments, closer to home. Bureaucratic and business candidates scatter campaign activities, buying support where they implanted projects and where they identify vulnerable municipalities. Candidates from families with long traditions in politics ought to be more pork-oriented, making more amendments.²³

Pooling and estimation. Estimation began with observations at the level of individual deputies; that is, all deputies who served in 1986 and ran for reelection in 1990. I then pooled the deputies by state, and in

²¹If a deputy had a single municipality with a personal share clearly above any other, I selected that municipality as the core. If the deputy's personal shares in two municipalities were within a few percentage points, I chose the municipality with a higher municipal share as the core.

²²The socioeconomic indicators come from the 1980 census, except for the size of the voting population, which is drawn from the 1989 electoral rolls.

²³Deputies have political family if a relative of the same or older generation was or had been a mayor, state or federal deputy, federal senator, governor, or president. For biographical data see Câmara dos Deputados (1981, 1983, 1991); Brasil (1989), and Isto é (1991). Interviews with journalists supplemented the official sources.

two cases—six small northeastern states and three southern states—I pooled deputies in groups of states. This multi-state pooling, which increased the number of observations substantially, combines states that are similar in size, socioeconomic conditions, and political traditions.²⁴

Given that the number of amendments in each municipality cannot be less than zero, and given that most deputies make few amendments in any particular municipality, ordinary least-squares estimation is inappropriate. I experimented with an event-count Poisson model, but the Poisson results revealed some statistical irregularities, so I collapsed the amendment data into a dichotomous variable and implemented a logistic regression.²⁵ Table 1 presents simplified results for six states or state groups: Bahia, the six small northeastern states, Minas Gerais, Rio de Janeiro, São Paulo, and the three southern states. Full results, including coefficients and standard errors, are available on request.

Interpretation. In each state or state group, the model achieved a high level of statistical significance, so the empirical results support the overall theory well.²⁶ In terms of the theory's specific elements, let us consider first the arguments confirmed in all or nearly all the six settings, followed by hypotheses failing to receive consistent support.

Everywhere municipal dominance strongly stimulated amendment making. The higher the percentage of a municipality's votes a deputy won in 1986, the more likely that deputy was to pursue more support in the same place in 1990. The negative slope on the squared term means that deputies at some point regard a municipality as "locked up," thus meriting no additional effort. Diminishing returns, in other words, set in, but the actual inflection points were beyond nearly all the cases.

The theory argued that vulnerable municipalities, those with high proportions of migrants or with high levels of party fragmentation, would be campaign targets. Only in the states of Rio de Janeiro and São Paulo (where the sign was correct) did municipalities with many mi-

²⁴The six northeastern states included Alagoas, Paraíba, Pernambuco, Piauí, Rio Grande do Norte, and Sergipe. The three southern states included Paraná, Santa Catarina, and Rio Grande do Sul.

²⁵In certain states or state groups, the diagnostics for both Poisson and negative-binomial models showed overdispersion; for others the Poisson worked well. Since the real issue is whether a candidate targeted municipality x , not how many amendments were made in x , the logistic form is perfectly suitable. Substantively, the results are a bit closer to the model's predictions with the original Poisson, but both forms are very close.

²⁶Because this is an exploratory study—and to minimize references to insignificant coefficients with phrases such as "signs in the right direction"—I have adopted a .10 level of significance. However, over 80% of the significant coefficients also reach the .05 level.

Table 1. Will Deputy Submit Budgetary Amendment for Municipality?

Municipal and Individual Characteristics	Logit Estimation							South
	Prediction	Bahia	Northeast	Minas Gerais	Rio de Janeiro	São Paulo	South	
Distance from municipal center	-		-	-	+	+	+	+
Municipal distance squared	+		+	+				-
Distance from personal center	+		+		-			-
Personal distance squared	-		-		+			+
Municipal dominance	+	+	+	+	+	+	+	+
Municipal dominance squared	-	-	-	-	-	-	-	-
Concentration	+	+	+					-
Percent of vote to retired deputies	+	+	+	+				-
Percent migrants	+	+	+	+	-			+
Match to core: Income distribution	?		+	-				-
Match to core: Government employees	-		-					-
Match to core: Population	?	+			-			+
Interparty fragmentation	+	+	+	-	+			+
Intraparty fragmentation	+	+	+	+		+	+	+
Rank in party list in 1986	+	+	+	+		+	+	+
Local career	+	-			+			-
Local Career × Municipal distance	-	+		+	-			+
Local Career × Personal distance	-	-	+	-	+			-
Political family	+		-		+			-
N =		6666	3841	9106	1536	7410		6841

"+" means a positive coefficient, significant at the .10 level.

"-" means a negative coefficient, significant at the .10 level.

All likelihood ratios are significant at the .0001 level.

grants fail to attract deputies. Rio's deviance and the weakness of São Paulo probably stem from the high proportion of migrants in the cities of Rio and São Paulo themselves. Since so many deputies receive votes there, even a high proportion of migrants cannot make these cities appealing as amending targets, though they do attract other campaign tactics.

High levels of party fragmentation, both interparty and intraparty, increase everywhere the chances that candidates will target a given municipality. In Minas Gerais and São Paulo, only intraparty fragmentation increased candidates' amending activity. In these two states the Party of the Brazilian Democratic Movement, the PMDB, had attained a high level of dominance in 1986. In 1990 the PMDB would inevitably slip, so survival meant chasing the voters of party compatriots.

Deputies who finished low on their parties' postelection lists in 1986 certainly had reason to feel vulnerable. In every state except Rio, low ranking deputies (low ranks receive more positive scores) made significantly more amendments than their high-ranking colleagues. In Rio the relationship was positive but well below statistical significance. Most likely, the weakness of the vulnerability-amending relationship in Rio stems from the demographic importance of the capital combined with its unattractiveness as an amendment target.

At first glance, the distance hypotheses seem only weakly supported. Closer inspection, however, reveals that amending behavior reflects the distance of municipalities from deputies' core support in most cases. Minas Gerais and the six northeastern states support the original argument ("amend less with distance from municipal center").²⁷ In Rio, São Paulo, and the three southern states, deputies decreased their campaigning as a function of each municipality's distance from the core of their personal support rather than the core of their municipal domination.²⁸ Why the variation? In Minas and the northeast the average level of municipal domination is much higher than elsewhere; *mineiro* and *nordestino* deputies get substantial shares of their personal totals in places where they dominate. These localities remain crucial for them and they stay close to home. In Rio, São Paulo, and the South, the average level of domination (the deputy's percentage of the municipality's total votes) is less than half the level attained by *mineiro* and *nordestino* deputies. With low levels of domination, credit claiming is

²⁷The absence of the predicted sign on the quadratic term simply means that amending behavior showed no diminishing returns.

²⁸In both Rio and the South, the negative coefficient on the distance-from-personal-center variable dominates the coefficient of the distance-from-municipal-center variable.

more difficult, so the center of municipal domination is not the campaign reference point. Instead, deputies focus their campaigns where they receive the largest share of their personal totals.

Only in Bahia are budgetary amendments unrelated to the distance of municipalities from candidates' core support. Why is Bahia exceptional? Consider the political context. Bahia's governor, Antônio Carlos Magalhães (popularly known as ACM), is so powerful he can command candidates to campaign in particular municipalities. ACM's machine was built on his ties to the old military regime, ties that brought Bahia considerable federal largesse. ACM and his allies in the state bureaucracy reaped the political profits, and deputies with state-level bureaucratic backgrounds continue to dominate Bahia's congressional delegation. Only one of every eight *baiano* deputies has a local past—second lowest of any state—and purely local deputies are weak. Nonlocal Bahian deputies tend to have dominant-scattered vote distributions, so their amendments are necessarily dispersed. In a sense, the concept of a vote center means little to such deputies; they deal with local bosses wherever one is available.

What about the variables measuring the social match of each municipality to deputies' core constituencies? If deputies appeal to constituencies resembling those where they have done well, amendments ought to decrease as social distance increases. Government employees are a central constituency for many deputies, and such deputies do appear to seek similar municipalities: three states or state groups had significant results in the expected direction; only São Paulo had the wrong sign.²⁹

The other social-match variables demonstrate that ideological appeals are indeed rare in Brazil. Similarities in income distribution and population produced insubstantial and inconsistent results.³⁰ In addition, if deputies seek targets on ideological bases, social matching ought to be strongest in the most developed regions of the country. Rio, São Paulo and the South, however, produced results no more consistent than the Northeast, Bahia, and Minas Gerais. The negative result is important: i.e., most deputies see the social and ideological characteristics of municipalities as minor factors in their decision to use pork-barrel politics as a campaign tool.

Consider now the hypotheses failing to receive consistent support. The original theory predicted, albeit hesitantly, that candidates with

²⁹São Paulo's deviance probably results from the extreme unattractiveness of the highly competitive core city, where most bureaucrats live.

³⁰The failure of candidates to seek municipalities of similar size may have another cause: small communities yield few votes, while big cities are too competitive.

backgrounds in local politics would amend more than those with business or bureaucratic careers. Only in Rio and São Paulo did the hypothesis receive support, and in Bahia and in the South local candidates made fewer amendments. These differences are not simply functions of the domination of candidates with local origins, because the South and Minas have the highest percentage of locals, while Bahia and Rio have the fewest. Local candidates' tactics depend on historical contexts. Bahia, for example, has few local candidates, and those who venture from their bailiwicks risk incurring the wrath of ACM. Rio has even fewer locals than Bahia, but for demographic rather than historical reasons. Rio has only 65 municipalities to serve as springboards for its 46 deputies (1.41 municipalities per deputy) while Bahia has 8.6 municipalities per deputy. Locals in Rio lack opportunities, but since they confront no coercive machine, they are free to compete with statewide candidates by over amending. São Paulo has a substantial number of locals, but between 1987 and 1990 many defected from the dominant PMDB. These defectors had to contend with Orestes Quércia's powerful PMDB machine, which sent candidates into the bailiwicks of the defectors. But the machine lacked the power to keep its opponents bottled up in their bailiwicks, so expansion was their optimal strategy.

Politics in the South and in the Northeast, by contrast, reflect distinct historical contexts. In the South, party labels are meaningful, no governor enjoys the hegemony of an ACM, spatial concentration is intense, and local candidates dominate. Candidates *lacking* a local base struggle to find support, so local politicians wisely stay in their bailiwicks, making fewer amendments. The Northeast and Minas Gerais support intermediate levels of local candidates; locals neither struggle, as they do in Bahia and Rio, nor dominate, as in the South.

Originally, I expected that local politicians would simply amend less as they moved farther from their bases. Instead, the results provide an instructive comparison to our distance measures, i.e., the variables measuring changes in amending behavior of all deputies, regardless of political career. In Bahia, the South and Minas Gerais, local deputies increase their amending activity as they move away from the municipalities where they are most dominant, but they decrease activity as they move away from the municipalities where they get most of their votes. Capital cities in these cases have little importance in total state electorates; few personal centers are found in cities where the presence of many deputies discourages credit claiming. For most deputies, therefore, it makes sense to stay close to the places contributing the bulk of their votes. In the Northeast and Rio, however, capital cities have much more weight in total state electorates, and more candidates have per-

sonal centers in exactly these capitals. But since these capitals are home to many deputies, they discourage credit claiming, and local candidates are forced to flee in pursuit of new voters.

Retirements (assessed by the percentage of the 1986 vote received by candidates not competing in 1990) stimulated more amendments only in Bahia. In the South amendments actually declined where retirements freed more voters. This is a surprise, because in my interviews Southern deputies mentioned municipalities made vulnerable through retirements. Perhaps the timing was off: when deputies offered these amendments in 1988 and 1989 (for the 1989 and 1990 budgets), they might not have known who planned to retire.

The original argument suggested that candidates with spatially concentrated support would over amend to compensate for their geographically restricted vote bases. Only in Bahia and the Northeast did the hypothesis prove correct. Perhaps the argument fails because concentration is often related to domination; i.e., what really matters is local dominance rather than the spatial contiguity of votes. As a result, the domination variable (which supported the prediction in every case) simply overwhelms concentration. The case of Bahia once again reflects the power of Bahia's political machine. The machine discourages candidates from leaving their bases, so they overamend to increase local dominance.

Finally, why do deputies from political families fail to distinguish themselves? Political learning, I suspect, is very rapid. Whether members of political families or not, deputies quickly learn campaign tactics. Interestingly, members of Northeastern political families made significantly fewer amendments than *nordestinos* without family ties. Such ties are much more important in the Northeast than anywhere else; about 30% of all deputies in these states have political relatives, compared to less than 10% in the South. Political family in the Northeast often means old-style deal making, not populism; traditional *nordestino* politicians do less for their constituents—especially in terms of social assistance—and more for local bosses.

Recapitulation. The municipal-level campaign strategies of Brazilian deputies respond strongly to local dominance, to the vulnerability to invasion of potential targets, to their own electoral weakness, and to their previous careers. But the absence of campaign efforts in communities sociologically similar to deputies' core constituencies (exemplified by the weakness of the social-match variables) confirms the impression that few deputies seek votes along ideological lines. The absence of

party programs and the weakness of party discipline renders such appeals, except for the Workers' Party, unproductive.

Does Strategic Behavior Pay off Electorally?

Do the tactics of our vote-seeking deputies succeed? Table 2 estimates an "outcomes" model. It resembles the "strategy" model, but with important additions. The outcomes model incorporates 1986 vote as a predictor of 1990 vote. It also assesses the effects of overall (state-level) dominance—in addition to municipal-level dominance—to discover whether certain kinds of deputies were more successful. Each deputy's amendments, along with the amendments made by other deputies, are now explanatory variables. Finally, the model includes (to explore partisan realignment) variables measuring the gain of candidates from allied parties.³¹

The outcomes model works well, explaining more than 50% of the variance in candidates' 1990 vote everywhere except São Paulo.³² Vote received in 1986 was the most powerful predictor. This result would be expected in most polities, but here it contradicts Brazil's conventional wisdom, which holds that deputies' unpopularity makes incumbency a disadvantage. Campaigning matters. In Bahia, the Northeast, Minas Gerais and the South, amendments increased votes.³³ Amendments made a difference in Rio de Janeiro and São Paulo as well, but only for more dominant deputies, i.e., amendments in these states became more important as municipal dominance increased. Municipalities in Rio and São Paulo are mostly competitive, with few dominant deputies. Where deputies share votes with many others (as in the capitals) amendments are futile, but as dominance increases they make more sense.

³¹In the construction of this indicator, PFL and PDS votes measure right-wing gain; PMDB vote measures left-wing gain. The latter is an imperfect measure, but in many municipalities the PMDB was the only opposition to the right. Each deputy was coded, on the basis of party affiliation, in terms of right or center-left orientation. Similar results are obtained by using 1978 and 1982 MDB-PMDB vote totals as a purer substitute for the 1986 PMDB vote.

³²The poor performance of the model in São Paulo (although it easily attains overall statistical significance), may result from the state's high level of ideological politics, a function of the strength of leftist parties like the PT. The PT encourages voters to choose the party label instead of individual candidates.

³³The model incorporates logged amendments to reduce the effect of each "additional" amendment. In the South, the negative coefficient on the term representing the interaction between amendments and dominance means that amendments are counterproductive above a certain level of dominance. About 5% of Southern deputies fall above this inflection point. Such deputies may be engaged in a hopeless struggle to maintain their bases in a region where dominance is increasingly rare.

Table 2. What Determines Electoral Success?

Municipal, Individual, and Electoral Characteristics	OLS Estimation of Results of 1990 Election					
	Bahia	Northeast	Minas Gerais	Rio de Janeiro	São Paulo	South
Vote in 1986	+	+	+	+	+	+
Amendments by deputy (logged)	+	+	+	+	+	+
Amendments* municipal dominance	+	+	+	+	+	-
Amendment by other deputies	-	-	-	-	-	-
Distance from municipal center						
Distance from personal center						
State-level dominance in 1986	+	+	+	+	+	+
Municipal dominance in 1986	-	-	-	-	-	-
Municipal dominance squared						
Concentration in 1986						
Interparty fragmentation in 1986						
Intraparty fragmentation in 1986						
Match to core: Income distribution						
Match to core: Government employees						
Match to core: Population						
Rank in party list in 1986	-	+	+	-	+	-
Local career						
Allied parties gain from 1986	+	+	+	+	+	+
PFL-PDS candidate	+	+	+	+	+	+
PMDB or left candidate						
Political family						
Political family* municipal dominance						
$R^2 =$	53%	57%	53%	53%	20%	56%
$N =$	8040	6629	13740	1536	16530	8803

*+ means a positive coefficient, significant at the .05 level.

*- means a negative coefficient, significant at the .05 level.

All F tests for the entire model are significant at the .05 level.

Amendments by other deputies should lower a deputy's vote, because these amendments mean that opponents have also targeted the same municipality. Except in Rio and São Paulo—where other deputies' amendments had no impact—this is just what happened. The hypothesis failed in Rio and São Paulo for the same reasons we have seen above.³⁴

Dominant deputies gained more votes than those with shared distributions, but concentration helped only in Minas Gerais.³⁵ In an election with more than 50% turnover of incumbents, and with substantial losses on the part of the center and center-left parties, this result has great importance. *Dominance protects deputies from partisan swings*. Most incumbents who lost seats in 1990 shared constituencies. Single-member municipalities, whether contiguous or scattered, are safer. In an environment of weak parties and pork-barrel politics, deal making with local *políticos*—the classic dominant-scattered pattern—makes sense.

The strategy model demonstrated that deputies rarely seek campaign targets socioeconomically similar to their core municipalities. Not surprisingly, they are equally unlikely to gain or lose votes on this basis. Although in big cities deputies make ideological or group appeals, they do not seek or receive support in *distant* campaign targets with such appeals. Given the high cost of poaching on the turf of fellow party members, candidates increase support by appealing to new groups in their base areas, not by pursuing similar but geographically distant groups. Consequently, although changes in the overall ideological composition of legislatures may result from electoral realignments, such realignments are not the product of individual campaign appeals.

Partisan shifts play an important role in the fortunes of individual deputies. In every state, overall gains by parties close on the political spectrum helped candidates. Since this election represented a defeat for the PMDB after its overwhelming success in 1986, right-wing candidates ("PFL-PDS candidate") gained, while PMDB and left candidates got a boost only in the Northeast and in Minas Gerais.

Finally, the career paths of deputies, at least as measured by previous occupations or by membership in political families, had no consistent

³⁴We know from the *strategy* model that deputies make fewer amendments as the distance from their vote centers increases. The *outcomes* model shows that their 1990 vote was generally unrelated to the distance from the core. Remember, however, that the model includes the 1986 vote, so the coefficient should only be significant if there is an additional, unexpected concentration of votes. This occurs in two cases, Minas and São Paulo, where deputies with more *concentrated* vote patterns did better in 1990 than in 1986. I cannot currently explain this result.

³⁵The dominance variable masks any possible effects contributed by the two fragmentation measures. Obviously fragmentation is lower when deputies dominate municipalities.

effect on electoral outcomes. In the Northeast and Minas Gerais—areas where substantial percentages of deputies come from political families—these deputies had more success. But in Bahia, where political families are most common, such deputies received no help. In addition, local candidates did no better in any states. The election of 1990 represented an influx of big money into congressional campaigning. If this trend continues, local candidates, as these results demonstrate, are in serious trouble.

Recapitulation. The strategies of congressional deputies matter. Deputies profit by making their own amendments; they suffer when other deputies target the same municipalities. Deputies with dominant vote distributions are more successful at resisting partisan swings than those with shared distributions.³⁶ But most deputies gain little from concentrating their vote distributions or from making group or ideological appeals, and career patterns have no broad effect on electoral fortunes.

4. Conclusion

Most discussions of Brazilian politics stress its traditional, clientelistic roots. The theory developed here, by contrast, is grounded in the strategic behavior of rational politicians. Faced with an electoral system whose chief attributes include open-list proportional representation, large multimember districts, candidate selection at the level of politically active subnational units, and the possibility of immediate reelection, most deputies pay little attention to ideological appeals. Instead, they seek secure bailiwicks, search for vulnerable municipalities, and strive to overcome their own electoral weakness through “wheeling and dealing.” Strategic candidates do not behave identically, because their own political backgrounds vary and because the differing demographic and economic contexts of Brazilian states reward some tactics and penalize others.

What is the significance of these results? Consider the principal-agent relationship between voters and deputies. Brazil’s electoral system hinders voter control. It forces candidates to seek single-issue niches, to spend lavishly, and to make deals with candidates for other offices, candidates with whom they have nothing in common. The system cannot be faulted as undemocratic; indeed, by favoring no particular cleavage it allows all grievances to be articulated. But citizens learn little about the importance of national-level issues, and rational voters back candidates based on pork potential.

³⁶Deputies can also switch parties to profit from partisan surges.

Brazil's electoral system motivates deputies to seek pork. When we combine these incentives with the state-centered quality of Brazilian politics, the results suggest that pork seeking may not have reached an equilibrium. Deputies in Brazil's South and in more industrialized states face more competition from candidates of other parties, but they also have more concentrated vote distributions. Higher levels of education and wealth increase voter interest and involvement in politics, but that interest magnifies incentives for deputies to focus on pork. At the same time, demands for local benefits may contribute to the elevated turnover rates and low seniority levels of southern congressional delegations, factors which shift the ideological center of the Congress to the right.

In the legislative process, Brazil's system produces parties without programs, parties sheltering an enormous range of interests and preferences. Open-list proportional representation is not a sufficient condition for weak parties; pre-1973 Chile combined open-list PR with fiercely ideological parties. But open-list PR in Brazil works differently, because state interests control nominations, because parties cannot control the behavior of their deputies, and because high district magnitudes increase both inter- and intra-party fragmentation.

This analysis has only scratched the surface of the theoretical argument.³⁷ What are the implications of spatial voting distributions for subsequent legislative behavior? De facto, Brazilian deputies represent a wide variety of constituencies, from dominated single-member districts to scattered special-interest cohorts, to scattered deals, to intensive working-class districts. Do some districts insulate deputies from presidential demands? Is corruption a natural outgrowth of certain constituencies? Are some deputies more oriented toward national legislation? Congress' acceptance or rejection of deputies' budgetary amendments also merits exploration. Why are some deputies more successful than others? Are there rules guaranteeing everyone a piece of the action? Can senior deputies buy the votes of needy junior members? The Brazilian case, a system allowing the formation of various constituencies within a single institutional framework, is a perfect laboratory for the study of electoral influences on legislative behavior.

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³⁷These findings also have implications for other political contexts with similar rules, e.g., U.S. primary elections (both legislative and presidential) and at-large city council contests. With the spread of geographic information systems, it has become much easier to explore these settings.

APPENDIX

Data Sources and Problems

The map and Moran's I. I constructed the computerized maps with state road maps, a digitizing table, and Autocad. The data base also includes, in addition to electoral results, indicators from the 1980 census, all budgetary amendments offered for the 1989-91 budgets, and the results of the 1989 presidential election. The nearest-neighbor matrices used to calculate Moran's I derived from the map coordinates. Paul Sampson of the University of Washington provided the program creating these matrices. For an introduction to spatial analysis, see (Cliff et al. 1975).

The politically motivated tendency for municipalities to subdivide can seriously hinder mapping. Since the census data are based on 1980 borders, municipalities created after that date must be aggregated into old ones. In some cases the number of new units was so great that aggregation distorted political events. In other cases old states were compromised by the creation of whole new states. As a result, the analysis excludes Goiás, Tocantins, Mato Grosso, Mato Grosso do Sul, Acre, Amapá, Rondônia and Roraima. Although malapportionment gives these states considerable political force, most have very small populations.

Budgetary amendments. Each year the Joint Commission on the Budget publishes the amendments of deputies and senators (Brasil. Congresso Nacional, 1988-1990). Members submit these amendments on small cards, roughly 2" by 6", and the published volumes reproduce these cards, many of them hand written. Each card contains the name and state of the deputy or senator, the program modified, the municipality benefitted, the amount of money, and the program debited to finance the amendment. I coded all amendments in 1990 and 1991 but only a sample of the 72,672 amendments made in 1992. This paper does not utilize the 1992 group, because members of the new 1991-94 Chamber offered them. The analysis also excludes amendments (roughly 1%) benefitting no particular municipality. Thanks to Orlando de Assis and Carmen Pérez for help in obtaining the 1991 amendments.

The electoral results. For 1978 and 1982, the electoral results come from PRO-DASEN, the Senate's data processing arm. Thanks to Jalles and William for help. For 1986, the Tribunal Superior Eleitoral provided some data, but eight states never sent election results to Brasília. I copied results at the regional tribunals in these states. For 1990 the Tribunal Superior, with the assistance of Roberto Siqueira, Sérgio, Flávio Antônio, Conceição and Nelson, supplied data on diskette for fifteen states. Manuel Caetano in Porto Alegre helped with the *gaúcho* results.

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