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Can Institutions Cure Clientelism?

Assessing the Impact of the Australian Ballot in Brazil

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Abstract[1]

This paper examines how the adoption of the Australian ballot (AB), and ipso facto, the transition from the nominal to effective secret vote, shaped the nature of party politics in Brazil. Engaging the literature on political clientelism, the impact of the AB on three outcomes is studied: 1) the ideological leanings of voters at the ballot box; 2) the degree of electoral control enjoyed by local vote brokers; and 3) the capacity of citizens to effectively participate in the electoral process. In order to get leverage on these issues, the paper utilizes an original dataset—painstakingly assembled from regional electoral archives—which contains municipal-level vote returns for federal deputy and senate contests during the period before and after the AB's introduction in Brazil (1958-1962). The dataset exploits the fact that the AB was introduced at different times in different states and for different offices in the country, thereby creating an unprecedented opportunity to assess the impact of this institution. Using a triple difference-in-difference procedure, the study finds that the AB: 1) shifted the ideological balance of power from Right to Left; 2) did not greatly weaken the hand of vote brokers; and 3) greatly increased the proportion of wasted votes cast in elections.

JEL Classification: K, O17, D72, N4, N46
Keywords: Brazil, vote secrecy, electoral institutions, clientelism, political participation

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1 Introduction

The ballot is the fundamental instrument of democracy in the modern world. Perhaps more than any other device utilized in contemporary elections, it has come to embody the process by which voter preferences structure the makeup of the ruling elite. Yet many citizens of democratic polities take for granted the series of institutional innovations in the dissemination and composition of the ballot that made it possible for this instrument to serve today as a symbol of the free and authentic convictions of voters. Among such innovations, it was a specific packet of reforms in ballot preparation and distribution, the so-called Australian ballot (*AB*) reforms, which were responsible for one of the most crucial turning points in the history of democracy—the transition from *de jure* to *de facto* secrecy in vote choice.

What did the adoption of the *AB* entail? In many countries, the adoption of the *AB* was preceded by a system in which nominally secret voting was enacted through privacy guarantees provided at the moment of suffrage, usually in the form of closed voting booths and a requirement that ballots not have markings that could identify individual voters. In such contexts, parties and/or candidates printed ballot papers themselves and distributed them, via campaign workers, to potential voters. The ballot papers utilized in such circumstances were specific to the candidate or party, and represented a vote only for that individual or organization. This state of affairs allowed candidates or campaign workers to condition any benefits (or punishments) targeted to individual voters on their receipt of the candidate or party printed ballot. Moreover, in such settings political actors often organized the transportation of voters to the polls and allocated the candidate or party printed ballots to voters immediately before the latter entered the polling station, thereby reinforcing the actors' capacity to infer whether or not voters had voted their way. In an *AB* system, by contrast, all ballots—printed by the state at public expense—have an identical format, permit the selection of any registered candidate, and are typically allocated to voters inside the polling station by electoral authorities. As such, the capacity to monitor individual vote choice is much reduced by the adoption of the *AB*. At the same time, the *AB* also imposes new educational requirements on voting, as the ability to read the printed word may suddenly become a prerequisite for casting a valid ballot.

This paper provides an empirical examination of how the adoption of the *AB*, and *ipso facto*, the transition from the nominal to effective secret vote, shapes the nature of political representation. It does so by drawing from the historical experience of Brazil before and after the introduction of the *AB* in this country in the early 1960s. Directly engaging the claims of both an emerging literature on institutions and clientelism in developing democracies as well as an established literature on the consequences of the *AB* in the United States, the paper assesses the impact of the Australian ballot on three outcomes: 1) the Left-Right ideological leanings of voters at the ballot box; 2) the degree of electoral control enjoyed by local vote brokers (*coronéis* as they are

called in the historiography of Brazilian elections); and 3) the capacity of citizens to effectively participate in the electoral process.

The question of how vote secrecy affects the conduct of politics is a foundational concern in the social sciences, and one which is as old and enduring as democracy itself. It has long captivated some of the keenest minds in the Western world. The adoption of the secret vote in Ancient Rome was of deep concern for no less than Quintus and Marcus Cicero, who believed that it undermined the political dominance of the nobles and ultimately led to the decline of the Republic (Yakobson (1999), pp.126-133). Nearly two millenia later, Montesquieu weighed in on the issue by arguing that voting ought only be conducted in public, as good governance required that the masses *"*be directed by those of higher rank, and restrained within bounds by the gravity of eminent personages*"* (*Spirit of the Laws* (1873) [1748], p.14). Jean-Jacques Rousseau also addressed the consequences of the secret ballot, claiming that it had the beneficial effect of reducing vote buying (*The Social Contract* (1988) [1761], p.118). A century afterward, John Stuart Mill expressed serious reservations about vote secrecy, claiming that a secret ballot would debase political life by making it easier for citizens to vote based on calculations of personal advantage instead of societal wellbeing (*Considerations on Representative Government* (1867) [1861], pp.80-89).

Given the illustrious intellectual pedigree of the debate on vote secrecy, it is not surprising that much contemporary scholarship remains devoted to teasing out the impact of a fully secret ballot. In fact, it is no exaggeration to state that empirically evaluating the impact of the secret ballot–as manifested by the introduction of the AB–on the structure of political representation is one of the great quests of institutionally oriented social science. It is a task which has courted the efforts of political scientists, economists, and historians, and one which has spawned numerous investigations into the historical experiences of polities around the world. Yet in spite of these efforts, it has proven quite challenging to arrive at a clear consensus about the precise manner in which vote secrecy reshapes the contours of democratic representation.

The central difficulty for researchers has been to put together a dataset which offers sufficient leverage to credibly evaluate causal claims about the impact of the secret ballot. We would submit that by drawing upon the Brazilian historical experience with the *AB*, this study was able to assemble and analyze just such a dataset. As will be described in detail below, the unusual staggered and geographically and institutionally targeted fashion in which the *AB* was introduced in Brazil provides the study with an unprecedented opportunity to measure with precision the causal impact of this important democratic innovation.

There are three crucial sources of variation which undergird our empirical analysis: 1) spatial (differential adoption of the *AB* across states); 2) temporal (differential adoption of the *AB* over time); 3) institutional (differential timing of the adoption of the *AB* for different types of elected offices). Taking maximal advantage of these three sources of variation, we utilize the powerful but

rarely employed triple difference-in-differences estimation strategy. Average differences in electoral outcomes are assessed across different offices (federal deputy vs. senate) prior to and after the *AB* was introduced for one of these offices (federal deputy) in a particular state (São Paulo). Inference proceeds by comparing the average over time difference in outcomes across offices for municipalities located in the state where the *AB* was adopted for the office in question (São Paulo) to the average over time difference in outcomes across offices for municipalities located in states where the *AB* was not adopted for said office (the other states).

In adopting this approach, we build upon recent work in political science and political economics that makes use of traditional, spatio-temporally based difference-in-difference methods to study the effects of institutions and policies (cf. Ladd and Lenz 2009, Lyall 2009, Persson and Tabellini 2008) as well as institutionalist scholarship that exploits differences across institutional arenas within polities (at a given point in time) to examine how the formal rules of the political game shape outcomes (cf. Crisp 2007, Desposato 2006, Stratmann and Baur 2002). By bringing these strategies together in a single empirical framework, we believe our paper is the first in Political Science to provide a template for simultaneously exploiting variation over space, time, and the institutional targeting of rules in order to assess the causal impact of an important aspect of democratic institutional design.

To anticipate our findings, our paper shows that the adoption of the *AB* sharply increased the fraction of valid votes cast in favor of parties of the Left, confirming an important recent claim made in the literature (as well as the ancient fears of the brothers Cicero). However, we find that the reason it had this effect lies primarily with the remarkable obstacle to voting it created for voters suffering from functional illiteracy. In particular, we find that the *AB* engendered a massive increase in wasted votes, i.e. the casting of blank or null ballots. Moreover, we show that this impact was most pronounced in areas where levels of literacy were low. As is often the case in agrarian settings, voters in such areas were likely to be under the influence of local notables and tended to vote for the parties of the Right. By making the act of voting unintelligible to such citizens, the *AB* made it impossible for them to vote as their local notable had dictated, even if they were otherwise inclined to do so. Ironically, the *AB* thus fashioned a more progressive politics in Brazil in the most regressive of ways: by disenfranchising the extremely poor and uneducated.

2 Theses about the Consequences of the Australian Ballot

Issues of ballot design have been the focus of considerable scholarly production in political science in recent years. Most publications have concentrated on identifying the ramifications of variation in ballot composition and layout. Work on ballot composition—who gets on the ballot—has examined in detail issues such as the electoral and policy implications of candidate nomination control vested in party leaders versus primary voters (cf. Carey and Polga-Hecimovich 2006, Hirano, Sny-

der, and Ting 2009, Serra 2011) and the impact of gender and ethnic quotas on representational equity (cf. Bhavnani 2009, Jones 2009, Reynolds 2005). The literature on ballot layout—the organization and presentation of choices on the ballot—encompasses a vast research program on the manner in which the capacity of voters to manifest preferences over candidates contained within party lists (in proportional representation systems) affects party discipline (cf. Carey (2009), Desposato (2006), Morgenstern (2004)), the content and targeting of public goods (cf. Ames (1995), Crisp et al. (2004)), and more distal outcomes such as corruption (cf. Gingerich 2009, Golden and Chang (2001), Persson, Tabellini, and Trebbi (2003)). It has also spawned several targeted research programs examining the electoral impact of the order of candidates on the ballot (cf. Ho and Imai(2008), Miller and Krosnick (1998), Lijphart and Lopez-Pintor (1988)), the use of color and symbols (Reynolds and Steenbergen (2006)), and overall ballot complexity (Niemi and Herrnson 2003, Wand et al. (2001)).

This upsurge of research on often relatively fine-grained nuances of ballot design in contemporary democracies has inspired social scientists to take a step back and revisit a question which has long intrigued historians of democratic practice: how did the transition from *de jure* secret voting—the use of the ballot box and closed voting booths—to *de facto* secret voting—the introduction of the *AB*—affect local power structures and electoral outcomes? Three main responses have been proffered to these questions.

Firstly, scholars have argued for many years that the *AB* undermines the effectiveness of using bribes and/or sanctions to manipulate the voting decisions of individual voters, and, as a consequence, erodes the power of political actors who rely on these tactics as a central means of bringing out the vote. The logic undergirding this claim rests on the enforceability of vote contracts with and without the *AB*. In the absence of the *AB*, voters generally cannot get away with accepting the ballot and bribe offered by a political operative then voting their conscience anyway, nor do they usually have the wherewithal to resist the demands of an employer or patron without paying a steep price. This is because the reliance of voters on candidate or party printed ballots makes shirking on a deal or the failure to comply with orders easily verifiable by the concerned political actor. Of course, in theory voters may be able to accept the ballot from one political operative then switch it later for another. However, to do so the voter must solicit the ballot from a different operative; this is a semi-public act which may very well be observed by the operative the voter has betrayed. Moreover, to the degree that political operatives control transportation to the polls, the opportunities for such switching may be practically nonexistent.

In the mid-19th century United States and 1940s Minas Gerais, Brazil, for example, nearly identical institutions were developed to minimize ballot switching. Referred to as "cooping" in the former and the use of "electoral barracks" in the latter, campaign workers would funnel voters into a building or warehouse, provide them with drink and entertainment until the day of the election,

then carefully guard the voters' approach to the polling place so that no competing ballots could ever reach their hands (Bensel (2004), pp.179-184, Carvalho (1958), pp.30-32). In this environment of high vote monitorability, voting contracts are enforceable by political actors at a reasonable cost. As a consequence, it is typically argued that without the *AB*, a market in votes—negotiated either directly between candidates and voters or indirectly between candidates and brokers who control a captive electorate—is likely to flourish.

By contrast, it has been argued that the *AB* makes it virtually costless for a voter to accept a bribe or countenance a threat then subsequently vote as his heart desires. Individual-level voting contracts in this context are essentially unenforceable, which eliminates the possibility of an efficiently operating market in votes. Consequently, political actors who enjoy a comparative advantage in bribery and intimidation are likely to see their political clout decline as a result of the adoption of the *AB*. As famously put by the American reformer John Wigmore:

> By compelling the dishonest man to vote in secrecy, [the *AB*] renders it impossible for him to prove his dishonesty, and thus deprives him of the market for it. By compelling the honest man to vote in secrecy it relieves him not merely from the grosser forms of intimidation but from more subtle and perhaps pernicious coercion of every sort" (1889, p.32).

Exactly who loses under the *AB*? One set of losers should be any local agents who market citizens' votes to outside parties or candidates. In a series of influential papers, historically oriented political economists Jean-Marie Baland and James Robinson develop a model of electoral competition in an agrarian economy with non-secret voting (Baland and Robinson 2007; 2008). They argue that voter influence is achieved through contracts between politicians and local vote brokers—typically rural elites—who use their economic leverage over dependants (tenants, farm hands, public employees, wage laborers, etc.) to bring out the vote in favor of the political force that has purchased their loyalty. The exchange of goods for votes is thus indirect, mediated by local bosses who by virtue of their economic prowess can utilize threats to bring a fixed block of votes to the negotiating table. Baland and Robinson's central claim is that the opacity of vote choice brought about by the introduction of the *AB* undermines the capacity of brokers to condition future employment on past voting decisions, making it impossible for them to instruct their dependants how to vote and eliminating the prospect of future deals with politicians. In this way, the core basis of the political power of local brokers is eliminated by the move to the *AB*.

Although Baland and Robinson develop their model primarily with an eye towards the experience of pre- and post-reform Chile, it is one whose implications need to be taken very seriously in the context of Brazilian political development. Rural Brazil has had arguably the most politically relevant and longest lived experience with vote brokerage of any polity in the Americas. A vast set

of scholarly contributions from historians, anthropologists, and sociologists describes the activities of the country's so-called *coronéis,* backland bosses who routinely negotiated the electoral support of their dependents in exchange for control over patronage resources within their municipalities of influence (cf. Leal (1949), Vilaça and Albuqueque (2003) [1965], Pang (1973)). These individuals were notorious and highly politically active during the time of the introduction of the *AB* in Brazil. Thus, if Baland and Robinson's claims about the *AB* and the waning powers of brokers are correct, they should certainly hold for the Brazilian case studied here.

The second argument about the consequences of the *AB* concerns its ramifications for the ideological balance of power in the party system. In this regard, the literature claims that the *AB* increases the electoral strength of parties of the Left relative to those of the Right. Two scenarios have been elaborated to explain why this should be so. In the first scenario, suppose that different groups of voters share a roughly equivalent intrinsic valuation of voting their conscience and that for all voters there is decreasing marginal utility of income. It then follows that the reservation price demanded by rich voters to vote contrary to their ideological preferences will be greater than that demanded by poor voters, implying that vote buyers will primarily target the poor and that ideological preferences of this segment of the electorate will be systematically underrepresented in official vote returns (Anderson and Tollison (1990), cf. Stokes (2005)). The introduction of the *AB*, by removing pecuniary inducements from the equation, supposedly creates a tighter correspondence between the distribution of ideological preferences in the electorate and vote returns, in so doing shifting electoral support away from the parties of the Right and toward the parties of the Left.

The logic for the second scenario is similar. That claim here is that, since vote brokers are often landowners or large employers, they have a natural affinity to the parties of the ideological Right and primarily offer their services to these organizations. After the *AB* is introduced and the dependants under the brokers' control become politically liberated, parties of the Left or Center-Left scoop up these voters, whose economic interests are more naturally aligned to Left-of-Center party platforms (Baland and Robinson 2008). As a consequence, the electoral support of the Right wanes and that of the Left grows.

A final purported consequence of the introduction of the *AB* concerns its implications for political participation. Most extant scholarship on the topic argues that the *AB* erodes citizen participation in elections, particularly as measured by voter turnout (cf. Heckelman (1995), (2000), and Schaffer (2002)). One strand of this literature argues that in certain instances it may be appropriate to think of the *AB* as a form of suffrage restriction, i.e. a legal impediment to voting instituted so as to keep certain social groups from successfully participating in the electoral process (Kousser (1973), (1974), and Crowley (2006)). The claim centers on how the move to the *AB* affects the voting process for illiterates. Under a party or candidate printed ballot system, the mechanics of

voting require nothing more than to slip the ballot into the urn (or the official envelope and then the urn, as was the case in Brazil), a task requiring no special educational background. In order to participate effectively with the *AB* in place, however, the voter must typically have sufficient literacy skills to recognize the written name of his favored candidate and be able denote his preference appropriately. If illiteracy has a distinct partisan bias, meaning that it afflicts the supporters of some parties more than others, then the introduction of the *AB* may shift electoral fortunes in favor of the parties with the relatively more literate support bases.

This is apparently what occurred in a number of states in the late 19th century American South. Democratic party leaders realized that an *AB* system would effectively disenfranchise African-Americans (whose literacy rates at that time were quite low), thereby giving them an electoral advantage vis-a-vis their Republican rivals (who depended upon African-Americans as a crucial part of their support coalition). Indeed, the epoch known as the so-called "one party South"–due to the electoral dominance of the Democratic party–followed soon after the introduction of the *AB* (as well as a host of other, more explicit, suffrage restrictions). A stanza from a racist Democratic campaign song in Arkansas from the era illustrates the perception among party members that the *AB* would disenfranchise African Americans, thereby benefiting the party:

> The Australian Ballot works like a charm/It makes them think and scratch/And when a negro gets a ballot/He has certainly met his match (quoted in Kousser (1974), p.54)

The prospect that the Australian Ballot would have disenfranchising effects on illiterates in Brazil, and important electoral consequences through this channel, is one which would certainly appear to be reasonable on its face. The 1960 demographic census, which took place around the time of the institutional changes studied here, reported that 40.3% of Brazilians above the age of 18 (the legal age of suffrage) did not know how to read and write (*Instituto Brasileiro de Geografia e Estatística* (1967)). Thus, a very large contingent of voters stood to be affected by ballot reform that necessitated familiarity with the written word. Now, according to the letter of the law, this actually should not have mattered all that much: illiterates had been legally barred from voting in Brazil since the Constitution of 1891, a right they only regained almost a century later with the Constitution of 1988. As a matter of practice, however, illiterates regularly participated in Brazilian elections throughout the 20th century (Love (1970)). This state of affairs was due largely to lax registration requirements: the proof of literacy required to register to vote entailed no more than signing one's name in the presence of an electoral judge. As a consequence, *coronéis* were known to coach functional illiterates on how to sign their names so that these individuals could later be brought before a judge and inscribed as registered voters (Blondel (1957), pp.74-77). These voters

would subsequently become part of a *coronel*'s clientele, voting the ballots that he or his underlings allocated to them.

Due to the strong concentration of functional illiteracy in the impoverished rural areas of Brazil, traditionally the strongholds of conservative local bosses, if it is true that the *AB* effectively disenfranchises illiterates, then it should also have had important consequences for the ideological balance of power in the party system. In particular, one would expect that were the *AB* to prohibit registered voters with low levels of functional literacy from participating in the electoral process, this would redound to the benefit of the parties of the Left, since these had supporters who were relatively well educated and located in cities (Soares 2001).

To summarize, the literature emphasizes three consequences of the *AB*, each of which we explicitly evaluate in this paper: 1) the *AB* shifts the ideological balance of power from Right to Left; 2) the *AB* weakens the power of local vote brokers; 3) the *AB* creates a considerable obstacle to effective political participation by illiterates.

3 Improvements Over Previous Studies of the *AB*

The empirical research strategy utilized in this paper improves upon existing analyses of the impact of the *AB* in several fundamental ways. Firstly, the study provides the first set of analyses of the *AB* in Latin America which are able to exploit both cross-sectional and temporal (not to mention institutional) variation in its adoption. Moreover, due to the highly standardized manner in which the *AB* was imposed on or withheld from states in Brazil, the paper is able to study the impact of the *AB* free from concerns about mismeasurement of the true nature of the institutional intervention being analyzed, a potentially serious problem in other settings. As a result of these advantages, we are able to provide more direct and credible estimates of the *AB*'s causal impact than have been presented in existing work.

The two most prominent sets of investigations of the impact of the *AB* in Latin America assess its impact through indirect means, utilizing research designs in which the key institution is either held fixed or is changed for all units at a single point in time. The pathbreaking studies of Susan Stokes and colleagues exemplify the former strategy (Brusco, Nazareno, and Stokes 2004, Stokes 2005). In this work, the authors indirectly infer the effect of the *AB* based on the difference in the declared influence of handouts on vote choice for Argentine survey respondents who cast ballots received from party operatives versus those who cast ballots received inside the polling station. Here the choice to use a ballot garnered from party operatives or one provided inside the polling station is treated as a rough proxy for the existence of the institution of the *AB*. The difficulty with this research strategy is that individual choices are, in general, precarious stand-ins for institutions. In this case, the decision to accept a ballot from party operatives may reflect a host of measurable and immeasurable characteristics that make an individual more or less desirous

of receiving a bribe. As such, the fact that receiving a ballot from a party operative is correlated with strong self-reported influence of handouts on voting behavior may be attributable to the fact that those individuals for whom handouts are highly valued are the most inclined to search out party operatives from whom to receive ballots. With no institutional variation across units (i.e. respondents) in the key institution of interest, it is challenging to extract conclusions from the survey data about how the presence of the *AB* per se would have changed political behavior in Argentina.

The papers by Baland and Robinson exemplify the latter strategy. In particular, the authors indirectly infer the impact of the *AB* from changes in the relationship between the size of the agricultural workforce and Right party support as well as changes in land prices before and after the adoption of the *AB* in Chile in 1958. Since the *AB* was applied to the entire country at a single point in time, however, their findings have weak power against alternative explanations emphasizing concurrent institutional, cultural, or socioeconomic changes. Specifically, scholars have argued that one of the reasons one finds a drop in Right party electoral support in Chile in the late 1950s and 1960s, especially in rural areas, is that there was a major schism between the Catholic Church and the conservative parties that led to peasant outreach efforts by Catholic reform organizations at roughly the same time the *AB* went into effect (Scully (1992), pp. 130-132). Even if the *AB* had no effect, these efforts might explain why one finds the changing relationship between the size of the agricultural workforce and Right party support encountered in the authors' data. A similar argument could be made for the relegalization of the Chilean Communist Party, which also occurred simultaneous to the implementation of the *AB*. Unfortunately, disentangling the impact of these factors from that of the *AB* is impossible given the temporally and spatially uniform way the *AB* was adopted in Chile.

A recent study examining the impact of the adoption of the *AB* in Colombia in 1991 faces the same types of inferential challenges (Santos 2007). This work assesses whether or not the *AB* destabilized clientelistic linkages between voters and Colombia's traditional parties by examining the pre- and post-reform relationship between votes for traditional parties and public employment in precincts located within the capital city of Bogotá. However, as recognized by the author, the changes which took place in this relationship could very well be attributed to other institutional reforms taking place at the same time, such as the professionalization of the bureaucracy, the reduction of pork barrel expenditures, and greater functional autonomy of the Mayor's Office. As a consequence, pinpointing the exact contribution of the *AB* is impossible.

With variation in the adoption of the *AB* across units, time, and even types of elections, such concerns do not apply to the current study. In addition to overcoming obstacles to the estimation of the impact of the *AB* in Latin America, the analyses conducted here also significantly improve upon investigations of the *AB* conducted in contexts where both temporal and cross-sectional variation

in the adoption of the *AB* were present. The most widely researched country case fitting this description is the United States, which, like Brazil, adopted the *AB* in some states earlier than others, thereby permitting the exploitation of cross-sectional and temporal variation as we do here.[2] However, studies of the *AB* in the US are plagued by the difficulty that the internal organization of the official ballot differed drastically by state, as did the nature of the party printed ballots that preceded the official ballot. As a consequence, it is very difficult to speak of the impact of "the" *AB* in the US, since no such single entity existed. Put in the language of program evaluation, the myriad and subtle ways in which the *AB* was implemented across states in the US makes it highly probable that analyses based on the US case will suffer from biases due to "unrepresented versions of the treatment" (Rubin (1986)).

Not so for Brazil. During the period covered by the study, Brazil's electoral legislation carefully specified the characteristics that both the official ballot and the candidate printed ballots had to satisfy. These were nationwide standards strictly enforced by the regional electoral tribunals that make up the country's centralized electoral justice system. Consequently, the presence or absence of the *AB* for a given office in one state meant the same thing as it would in any other state. By studying the *AB* in Brazil, one can rest assured that the study is estimating the effect of "the" *AB*, at least in the form in which it was adopted—uniformly—in that country.

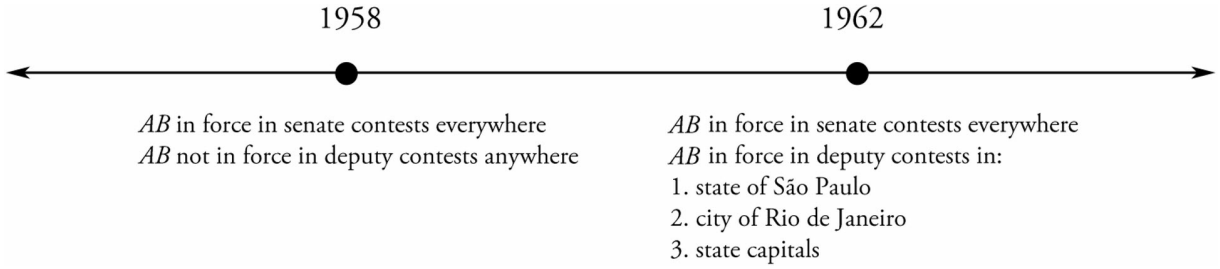
4 Institutional Background

Brazil's experience in rolling out the *AB* was both unusual and fortuitous from the standpoint of the social scientist. The *AB* was first introduced for presidential and vice-presidential elections in August 1955 (law 2582). The following year, the *AB* was extended to all other elected offices attained by a plurality vote (law 2982, art. 9): governor and vice-governor, senators and their substitutes (*suplentes*), mayors and vice-mayors, and justices of the peace. Subsequently, in July 1962, law 4109 extended the *AB* to offices filled by proportional representation—federal deputy, state deputy, and municipal councilor—but only for select jurisdictions. According to the law, the *AB* only applied to those proportional contests taking place in the state of São Paulo, the state of Guanabara (comprised solely of the city of Rio de Janeiro), and state capitals. A new electoral code promulgated in July 1965 (law 4737) was ostensibly to be the final step in the process, extending the *AB* to all electoral contests in all jurisdictions in Brazil. However, the part of the code dealing with the *AB* did not actually take effect until 1970.[3]

[2] Scholars examining the introduction of the AB in the United States have been particularly concerned with its impact on the strength of the party system, especially as manifested in split ticket voting. See, inter alia, Rusk (1970; 1974), Converse (1972), Burnham (1974), and Reynolds and McCormick (1986).

[3] The reason was that, in an attempt to placate the country's rural bosses, Brazil's military government (which took the reins of executive power in 1964) emitted a decree in August 1966 (complementary act 20) which maintained for the legislative elections of that year the system of candidate printed ballots for proportional contests held in municipalities

Figure 1. Timeline of Implementation of *AB* in Legislative Elections in Brazil,1958-1962



In order to get leverage on the impact of the *AB*, this study examines municipal-level vote returns for federal deputy and senate contests in the 1958-1962 period, the last set of legislative contests to take place before the onset of military rule in 1964 (subsequent articles will examine the 1966-1970 period). During this time, general legislative elections—which put seats for both the Chamber of Deputies and Senate simultaneously up for grabs—were held in 1958 and 1962. In 1958, the *AB* was in effect throughout all of Brazil for senatorial contests, whereas candidate printed ballots were utilized throughout all of Brazil for the deputy contests. In 1962, the *AB* remained in effect for all of Brazil for the senatorial contests but was also extended to deputy contests in the state of São Paulo, the city of Rio de Janeiro, and state capitals. Figure 1 provides a timeline of these events.

In municipalities where the *AB* was in effect for both types of contests, voters received an official ballot from the presiding officer in the polling station divided into two columns: one allowing the voter to denote her preferences for the plurality contests (which included the senate) and another allowing the voter to denote her preferences for the proportional contests (which included federal deputy). In municipalities where the *AB* was in effect for the plurality contests but not the proportional contests, voters received an official ballot from the presiding officer for the plurality contests only. In this case, the voter voted in two stages. First, she entered the closed voting cabin and marked her preferences on the official ballot for the plurality contests, subsequently folding it and dropping it into the urn. Next, she returned to the closed voting cabin, deposited the candidate printed ballot for the proportional contests into an official envelope provided by the presiding officer, and subsequently dropped the envelope into the urn.

For the plurality contests, the *AB* listed the names of each candidate running for each office (senator, governor, etc.), requiring the voter to denote her preference by making a mark next to the preferred candidate. For the proportional contests (federal deputy, state deputy, etc.), where the number of candidates running was typically very large, the *AB* provided the voter with two lines where she could write in the name or candidate number of her favored candidate for a given office.

with less than one hundred thousand inhabitants and which were not included in the jurisdictions that received the AB in 1962.

The full lists of candidates for these offices was not included on the ballot itself, although said lists were required to be posted in a visible location within the polling place (TSE Resolution No. 7018, September 4, 1962).

In the locales where candidate printed ballots were utilized for proportional contests, there were a series of requirements these had to satisfy. They all had to be white, rectangular in shape (approximately 7×10 cm), and sufficiently flexible to be folded into the official envelopes furnished by the electoral authorities. The name of the candidate, his party or coalition, and the office being contested all had to be typed onto the ballot. No other signs, slogans, or illustrations were permitted on the ballot. These rules were uniform: the regulations governing the layout of official ballots and candidate printed ballots applied equally to all municipalities in the territory of Brazil.

5 Data and Measurement

The primary data upon which this study draws are municipal-level vote returns, broken down by candidate and party, for federal deputy and senate contests held in 1958 and 1962. These returns are contained in municipal acts (*atas municipais*) which are housed in the archives of regional electoral tribunals located in the capital of each Brazilian state. A team of research assistants, composed of Brazilian nationals, was paid to visit these electoral tribunals and provide a digitized copy of the returns. Upon receipt of the digitized returns, these were then coded into electoral format by a team of graduate and undergraduate research assistants at the author's home institution. In total, municipal-level returns from this time period which included both federal deputy and senate elections were obtained for eight states: São Paulo (the treatment state), Bahia, Paraíba, Paraná, Pernambuco, Piauí, Rio Grande do Sul, and Rio de Janeiro state (the control states). The secondary data upon which this paper relies are demographic and socio-economic indicators from Brazil's census of 1960. Such indicators include population figures, literacy rates, employment broken down by sector (agriculture, industry), and several measures of material wealth.

The sample utilized in this study consists of interior municipalities only (non-state capitals) within the states indicated. This is because the experience of interior municipalities provides unique leverage in assessing the impact of the *AB*. In 1958, all such municipalities had the *AB* in place for the senate contest but not the federal deputy contest, providing a common baseline with which to compare the experience of the São Paulo municipalities and the control state municipalities. In 1962, all the interior municipalities of São Paulo adopted the *AB* for the federal deputy contest, whereas as *none* of the interior municipalities of the control states did so, permitting us to assess the impact of the *AB* from observed over time changes in outcomes across types of electoral contests in São Paulo and the control states.

Outcomes. The dependent variables utilized in the analysis correspond to the three hypothesized consequences of the *AB* discussed above. In order to tap into the ideological balance

of power in the party system, we examine two outcome variables: the percentage of the valid vote cast for candidates belonging to Left parties and the ideological center of gravity, defined as the percentage of the valid vote cast for candidates belonging to Right parties minus the percentage of the valid vote cast for candidates belonging to Left parties. These variables were recorded for each municipality in a given state for both the federal deputy and senate contests.

We classified the Left parties of the epoch as being the Brazilian Labor Party (PTB), a powerful, historically urban-based organization strongly tied to the organized labor movement created during the Estado Novo of Getulio Vargas (1937-1945), and the Brazilian Socialist Party (PSB), a smaller, more ideologically doctrinaire organization with a basis of support among intellectuals, students, and liberal professionals. Following standard treatments of the era (e.g. Carone (1985)), the parties of the Right were classified as the Social Democratic Party (PSD; a large, conservative organization run by the country's backland bosses), the National Democratic Union (UDN; a free market and moralistic party with a history of support for military intervention), the Liberal and Republican Parties (PL and PR; small conservative parties with a rural profile), the Party of Popular Representation (PRP; a small party with a fascist orientation), and the Social Progressive Party (PSP; a medium-sized conservative populist organization headed by the São Paulo politician Adhemar de Barros). Parties not included in the aforementioned groups were either essentially centrist (i.e. the Christian Democratic Party-PDC) or personality-centered micro parties with no clear ideological program (e.g., the Social Labor Party-PST).

For federal deputy contests, the electoral returns of this period report the number of votes cast at the municipal-level for entire parties (if a party ran an independent list of candiates), coalitions (if two or more parties in a state ran a joint list of candidates), as well as for individual candidates. In instances where coalitions were formed that contained parties of different ideological leanings, we faced the challenge of calculating the electoral support of each party within a given coalition (which was necessary in order to calculate total Left or Right support). We did this by following the strategy first recommended in Nicolau (2004): we calculated the party totals for member parties of coalitions by summing up the returns for each candidate belonging to a given party. Since the official electoral returns of the era do not list the party affiliations of candidates running on coalition lists, we acquired this information by consulting the *Historical Biographical Dictionary of Brazil* (*Dicionário Histórico-Biográfico Brasileiro*, DHBB), *Federal Deputies of Brazil, 1826-1976* (*Deputados Federais Brasileiros,* 1826-1976), the website of the Chamber of Deputies, the website www.eleicoespos1945.com, the websites of numerous state and municipal assemblies, as well as a large number of auxiliary sources. In this way, we were able to encounter the party affiliations of essentially all serious candidates (candidates whose personal vote total consisted of 2% or more of their coalition total in a given state). In the case of senate candidates,

which were relatively few, partisan affiliations were easily verifiable based upon official electoral returns and/or the sources mentioned above.

In order to measure the power of Brazil's local vote brokers, the *coronéis*, we use as our dependent variable the Herfindahl-Hirschman index of vote concentration for contests for federal deputy. For a municipality m in a given election, the vote concentration index is equal to:

$$VCI_m = \sum_i^N s_{i,m}^2,$$

where $s_{i,m}$ is the vote share of candidate i in municipality m and N is the total number of candidates. The VCI is bounded between 0 and 1, with higher values of the variable denoting a greater concentration of votes on a small number of candidates.

The motivation for using vote concentration in federal deputy contests as a proxy for broker control stems from Brazil's unique high magnitude open list proportional representation system in force for such contests. Federal deputies in Brazil run for election in districts which consist of entire states. Given the large number of seats up for grabs in most states, it is customary for dozens if not hundreds of candidates to run for election at a given time, which makes the potential dispersion of the vote across candidates quite high. This theoretical potential for dispersion notwithstanding, a political anthropology literature has documented that where powerful vote brokers are present, a municipality's votes tend to be highly concentrated on the single candidate who has been endorsed by the reigning broker (or otherwise split between two candidates if there happens to be dueling brokers) (Alves (2006), cf. Greenfield (1977), and Gross (1973)). For this reason, vote concentration serves as a reasonable approximation of the electoral clout of local brokers.[4] Unfortunately, the use of such an index in senate contests is not particularly useful, as those contests employed either single member districts in entire states (1958) or two member districts in the same (1962) during the period studied here, thereby sharply limiting the potential dispersion of the vote.

Finally, in order to capture (the inverse of) effective political participation, we utilize as an outcome variable the percentage of wasted votes (blank votes plus null votes) among all votes cast. This is a particular appropriate indicator of the quality of political participation in Brazil due to the fact that voting was and remains obligatory for registered voters, with fines and even a prohibition against future public employment assessed against violators. Given the costs associated with sitting out the election, one would expect that if the *AB* indeed made election procedures unintelligible to some voters, the evidence for this would show up primarily in wasted votes and less in related outcomes such as a decline in turnout.

[4] Since Brazil's open list system of proportional representation allows voters to vote for one of many different candidates running under the same party label, instances of high vote concentration are not explicable in terms of ideological sympathies for particular party platforms. For discussion of the link between vote concentration and oligarchical politics in Brazil, see Ames (2001) and Soares (2001).

Municipal "Emancipation". The primary unit of analysis for this study is the Brazilian municipality, a political unit roughly akin to a county in the United States. During the period from 1958-1962, some of the municipalities in the study sample underwent a so-called process of emancipation, meaning that they broke up into two or more new municipalities. In instances where this occurred, newly created municipalities in the second electoral period (1962) were grouped in such a way as to ensure intertemporal comparability with municipalities in the first electoral period (1958). For example, in February 1959, the district of Colômbia, São Paulo, broke away from the municipality of Barretos to become its own municipality. Thus, the electoral and demographic information for the municipalities of Barretos and Colômbia in 1962 was combined to provide comparability with the municipality of Barretos in 1958. Other instances of municipal liberation were handled in the same way. All told, our sample consists of 422 municipalities in the interior of the state of São Paulo and 714 municipalities located in the interior of the control states.

6 Statistical Framework

6.1 Institution-based D-in-D-in-D (Triple Differences)

In this section of the paper, we discuss the methodology utilized to study the impact of the *AB* on the three outcomes which vary across space, time, and type of election: the percentage of the valid vote cast for candidates belonging to Left parties, the ideological center of gravity, and wasted votes as a percentage of total votes. In order to study the impact of the *AB* on the vote concentration index, which varies across space and time but not types of elections, we utilize standard difference-in-difference techniques well described in textbooks on program evaluation (cf. Lee 2005, Angrist and Pischke 2009).

Notation. There are three observable quantities in the analysis. The first is the outcome vector, which is comprised of four separate observations: $Y^{FD}_{i,\text{PRE}}$, the observed outcome in the federal deputy contest of 1958, prior to the adoption of the *AB* for federal deputy in the treated municipalities, $Y^{S}_{i,\text{PRE}}$, the observed outcome in the senate contest taking place at the same time, $Y^{FD}_{i,\text{POST}}$, the observed outcome in the federal deputy contest of 1962, after the adoption of the *AB* for federal deputy in the treated municipalities, and $Y^{S}_{i,\text{POST}}$, the observed outcome in the senate contest also taking place in 1962. Our treatment indicator is denoted by $A_i \in \{0, 1\}$, where $A_i = 1$ indicates that the *AB* is utilized in i in 1962 for the federal deputy contest (municipalities in the state of São Paulo), and $A_i = 0$ indicates that individual ballots are used in i for said contest (all others). Finally, we observe a vector of baseline demographic attributes for each municipality, $\mathbf{X}_i \in \Theta_X$, measured prior to the introduction of the *AB* for the federal deputy contest in the treatment municipalities in 1962.

In order to describe the causal relationship between the *AB* and a given outcome, we follow standard practice and employ the Rubin-Holland-Neymann potential outcomes framework (cf.

Rubin (1974)). According to this framework, each post-treatment element in the outcome vector is characterized by the potential outcome function, $(Y^{FD}_{i,\text{POST}}(a), Y^{S}_{i,\text{POST}}(a))'$, which describes the outcome which would have obtained in the two types of legislative contests were $A_i = a$, i.e. were the ballot type utilized in the federal deputy contest in 1962 equal to a. The causal estimand of interest is the average treatment effect for the treatment (ATT), the average effect of the *AB* for the outcome in the federal deputy contest for those municipalities that utilized it for said office,

$$\tau = \mathbb{E}[Y^{FD}_{i,\text{POST}}(1) - Y^{FD}_{i,\text{POST}}(0)|A_i = 1]. \tag{1}$$

Identification. Two key identifying assumptions make it possible to estimate this quantity from the data. The first is that, on average, the ballot technology adopted for the federal deputy contest did not affect the outcome in the senate contest for the municipalities that employed the *AB*,

Inst.-based D-in-D-in-D assumption 1:

$$\mathbb{E}[Y^{S}_{i,\text{POST}}(1) - Y^{S}_{i,\text{POST}}(0)|A_i = 1] = 0.$$

This assumption would seem quite plausible on its face since *all* municipalities employed the *AB* for the senatorial contest–irrespective of whether or not they did so for the federal deputy contest. Given that the ballot technologies for the two contests were effectively delinked, there is no compelling reason to believe that the presence or absence of the *AB* for the federal deputy contest would have systematically affected voting patterns for the senate.[5]

The second assumption utilized is a weak form of the so-called parallel paths assumption. In particular, we assume that, conditional on the vector of attributes $\mathbf{X}_i$, the average over time difference in the difference in the outcome across institutional settings for the treated units would have been the same as the average over time difference in the difference in the outcome across institutional settings for the control units had the treated units not received the treatment:

Inst.-based D-in-D-in-D assumption 2:

$$\begin{aligned} & \mathbb{E}\left[\left(Y^{FD}_{i,\text{POST}}(0) - Y^{S}_{i,\text{POST}}(0)\right) - \left(Y^{FD}_{i,\text{PRE}} - Y^{S}_{i,\text{PRE}}\right)|A_i = 1, \mathbf{X}_i\right] \\ = \; & \mathbb{E}\left[\left(Y^{FD}_{i,\text{POST}}(0) - Y^{S}_{i,\text{POST}}(0)\right) - \left(Y^{FD}_{i,\text{PRE}} - Y^{S}_{i,\text{PRE}}\right)|A_i = 0, \mathbf{X}_i\right]. \end{aligned}$$

[5] Note that the assumption above is weaker than the assumption that the ballot technology adopted for the federal deputy contest would not have affected voting patterns for the senatorial contest for any municipality, i.e. $Y^{S}_{i,\text{POST}}(1) - Y^{S}_{i,\text{POST}}(0) = 0$ for all i. Although the latter assumption also seems plausible, only the former is needed for identification.

This very weak assumption allows for arbitrary baseline differences between treatment and control units due to (time invariant) unobserved heterogeneity, the existence of distinct time trends for federal deputy and senate contests, and the possibility that sources of unobserved heterogeneity affect outcomes for federal deputy contests and senate contests in different ways.

Now let us define the generic regression function $m(y|a,x) \equiv \mathbb{E}[Y_i|A_i = a, \mathbf{X}_i = x]$. In the context considered here, we have $Y_i = (Y^{FD}_{i,\text{POST}} - Y^{S}_{i,\text{POST}}) - (Y^{FD}_{i,\text{PRE}} - Y^{S}_{i,\text{PRE}})$, so that the regression function equals the expected value of the over time difference in the difference in the outcome across federal deputy and senate contests in municipalities with ballot technology a and fixed attributes x. Denoting the conditional distribution of $\mathbf{X}_i = x$ given $A_i = a$ as $F_{X|A=a}(x)$, the assumptions above imply that the ATT is identified from the observables in the model as

$$\tau = \mathbb{E}[(Y^{FD}_{i,\text{POST}} - Y^{S}_{i,\text{POST}}) - (Y^{FD}_{i,\text{PRE}} - Y^{S}_{i,\text{PRE}})|A_i = 1] - \textstyle\int_{\Theta_X} m(0,x) dF_{X|A=1}(x), \tag{2}$$

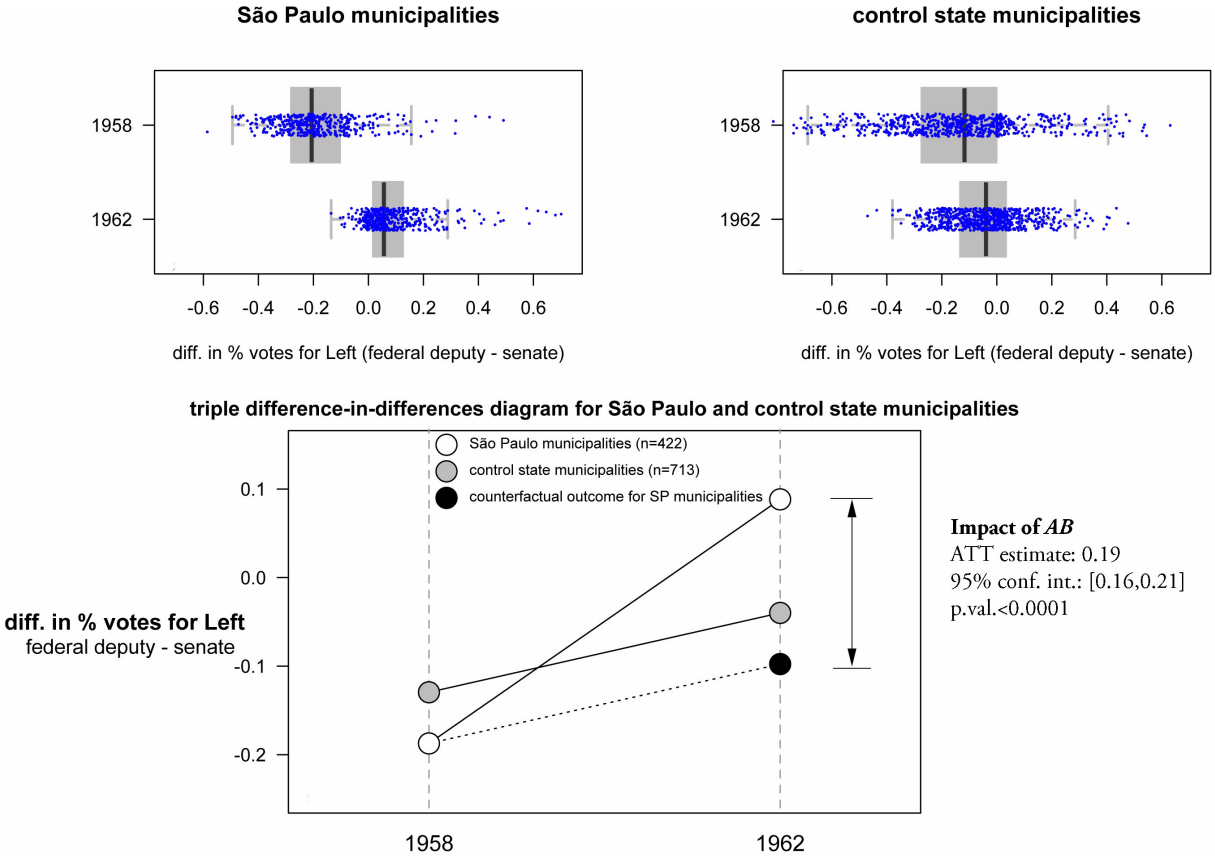
which states that the ATT is equal to the average value of the over time difference in cross-institutional differences in the outcome for the treated units minus the average value of the counterfactual regression function, where the average is taken over the marginal distribution of covariates among the treated units.

Estimation. Equation (2) suggests a fairly straightforward estimator of the ATT,

$$\widehat{\tau} = \frac{\sum_{i:A_i=1} \left((Y^{FD}_{i,\text{POST}} - Y^{S}_{i,\text{POST}}) - (Y^{FD}_{i,\text{PRE}} - Y^{S}_{i,\text{PRE}}) - \widehat{m}(0, \mathbf{X}_i) \right)}{\sum_i^n A_i}, \tag{3}$$

where $\widehat{m}(0,x)$ is an estimator of the regression function $m(0,x)$. Intuitively, the regression estimator $\widehat{m}(0,\mathbf{X}_i)$ imputes the unknown value of $(Y^{FD}_{i,\text{POST}}(0) - Y^{S}_{i,\text{POST}}(0)) - (Y^{FD}_{i,\text{PRE}} - Y^{S}_{i,\text{PRE}})$ for all i such that $A_i = 1$. That is to say, for all treated units, the regression estimator is used to compute the over time difference in the difference in outcomes across institutional areas that *would have obtained* had a given municipality (counterfactually) not received the *AB*. The ATT, in turn, is estimated as the difference between the average value of the observed over time difference in cross-institutional differences in the outcome for the treated units minus the average value of the estimated counterfactual over time difference in cross-institutional differences calculated for those same units. In order to calculate the ATT, we utilize several fairly standard strategies for estimating the quantity $\widehat{m}(0,\mathbf{X}_i)$, including nearest neighbor matching (Rosenbaum and Rubin 1985), local linear matching (Heckman, Ichimura, and Todd 1997), and coarsened exact matching (Iacus, King, and Porro 2011). In the interest of assessing the robustness of our findings, we also estimate the ATT using such methods as propensity score weighting (Hirano and Imbens 2001) and ordinary least squares regression.

Figure 2. The Estimated Impact of the *AB* on Electoral Support for the Left, (Non-state Capitals, 1958-1962) Raw Estimates (no Conditioning on Covariates)



Note: The upper panels depict box-and-whisker plots and jitterplots of the municipality-level difference between the percentage of votes cast for candidates of Left parties in the federal deputy contest versus the senate contest occurring in the year indicated. The bottom panel shows that municipalities in the interior of São Paulo, which had the *AB* in place in 1958 and 1962 for the senate and in 1962 for the federal deputy contest, experienced a significantly greater increase in relative support for the Left in federal deputy contests versus senate contests from 1958 to 1962 than did municipalities in the interior of the control states (Bahia, Paraíba, Paraná, Pernambuco, Piauí, Rio Grande do Sul, Rio de Janeiro), which only had the *AB* in place for the senate contests during this time.

7 Findings

Raw Data. We begin by simply examining the institutional and temporal difference in outcomes without conditioning on the demographic features of municipalities. Figure 2 displays the changes in the support of Left parties across federal deputy and senate elections before and after the implementation of the *AB* in federal deputy contests in the state of São Paulo. The uppermost panels in the figure present box-and-whisker plots and jitterplots of the municipality-level difference between the percentage of votes cast for candidates of Left parties in the federal deputy contest versus the percentage cast in the senate contest occurring in the year indicated. By simply examining the distributions of the data, one can clearly see that in 1958 municipalities in the interior of the state of São Paulo showed significantly greater support for the Left in senate elections than in elections for

the chamber of deputies. The same was true for municipalities in the interior of the control states. In 1962, when the *AB* comes into force for federal deputy elections in São Paulo, one observes a marked increase in the support for Left parties in the chamber of deputies election relative to the senate election. At the same time, from 1958 to 1962, one observes an increase of a markedly smaller magnitude for municipalities in the interior of the control states.

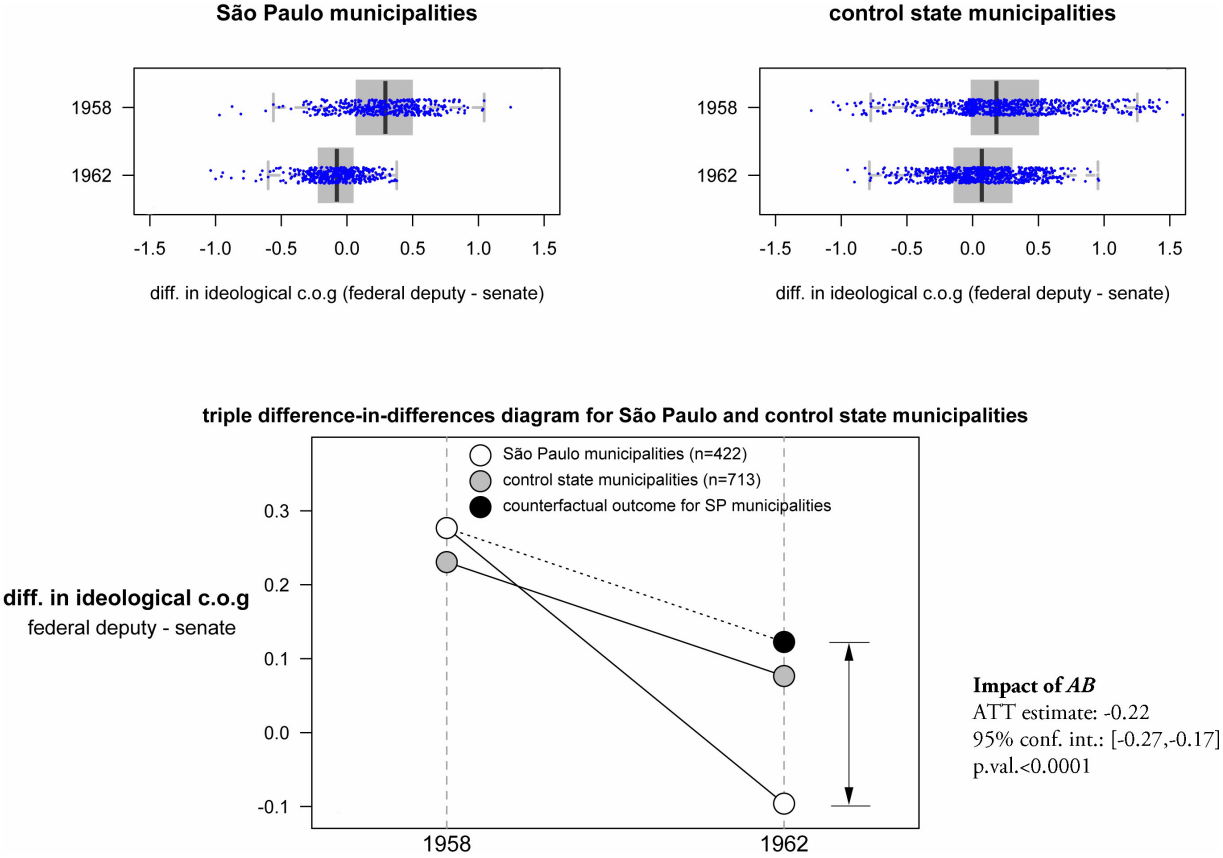
The mean difference in the over time institutional differences can be used to gauge the impact of the *AB*. The bottom panel of the figure provides a triple differences-in-differences diagram which illustrates this explicitly. In 1958, the average difference in Left support across federal deputy and senate elections was lower for municipalities in the interior of São Paulo than the control states, equal to -0.19 in the former and -0.13 in the latter. In 1962, this mean difference shot up to 0.09 for the São Paulo municipalities but increased only to -0.04 for the municipalities of the control states. Supposing that the mean outcome path for the São Paulo municipalities would have been parallel to that for the control state municipalities had São Paulo not adopted the *AB* for federal deputy in 1962, then in the absence of the treatment, the mean difference for São Paulo would have been equal to -0.10 in 1962 if it had not adopted the *AB*. The naïve estimate of the ATT (not controlling for covariate differences) is thus equal to the difference between the mean difference that did obtain for São Paulo in 1962 (0.09) and this latter quantity (-0.10), i.e. $\widehat{\tau}$=0.09-(-0.10)=0.19.

This quantity has the interpretation of being the effect of the *AB* on support for the Left in federal deputy elections in interior municipalities in São Paulo. The estimated naïve ATT has a 95% confidence interval of [0.16, 0.21] and is statistically significant by any reasonable standard. Substantively, the estimate tells us that, on average for those municipalities in the interior of São Paulo, the adoption of the *AB* for the federal deputy contest in 1962 led to a 19 percentage point increase in the valid vote going to Left parties. Here we have the first piece of evidence in favor of the hypothesis that the *AB* shifts the tenor of electoral politics in favor of the Left.

We further explore this hypothesis by examining the behavior of the ideological center of gravity, a measure which explicitly compares Right versus Left support in each type of election. Figure 3 presents a look at the raw data. The uppermost panels reveal that in 1958, when the *AB* was in place everywhere for the senate and nowhere for federal deputy, the ideological center of gravity leaned significantly further to the Right in federal deputy elections than senate elections, both in the interior municipalities of São Paulo as well as those of the control states. In 1962, the ideological center of gravity moves further to the Left in federal deputy contests than senate contests across the board, but this move is particularly pronounced within the municipalities located in the interior of São Paulo. Following the same procedure described above, the naïve ATT estimate for the effect of the *AB* on the ideological center of gravity was found to be equal to -0.22, with a 95% confidence interval of [-0.27,-0.17]. This suggests that the *AB* indeed pushed the ideological leanings of voters

in São Paulo from the Right to the Left, and provides a second piece of confirmatory evidence for the claim that the *AB* has important consequences for the ideological balance of power in the party system.

Figure 3. The Estimated Impact of the *AB* on Ideological Center-of-gravity, (Non-state Capitals, 1958-1962) Raw Estimates (no Conditioning on Covariates)

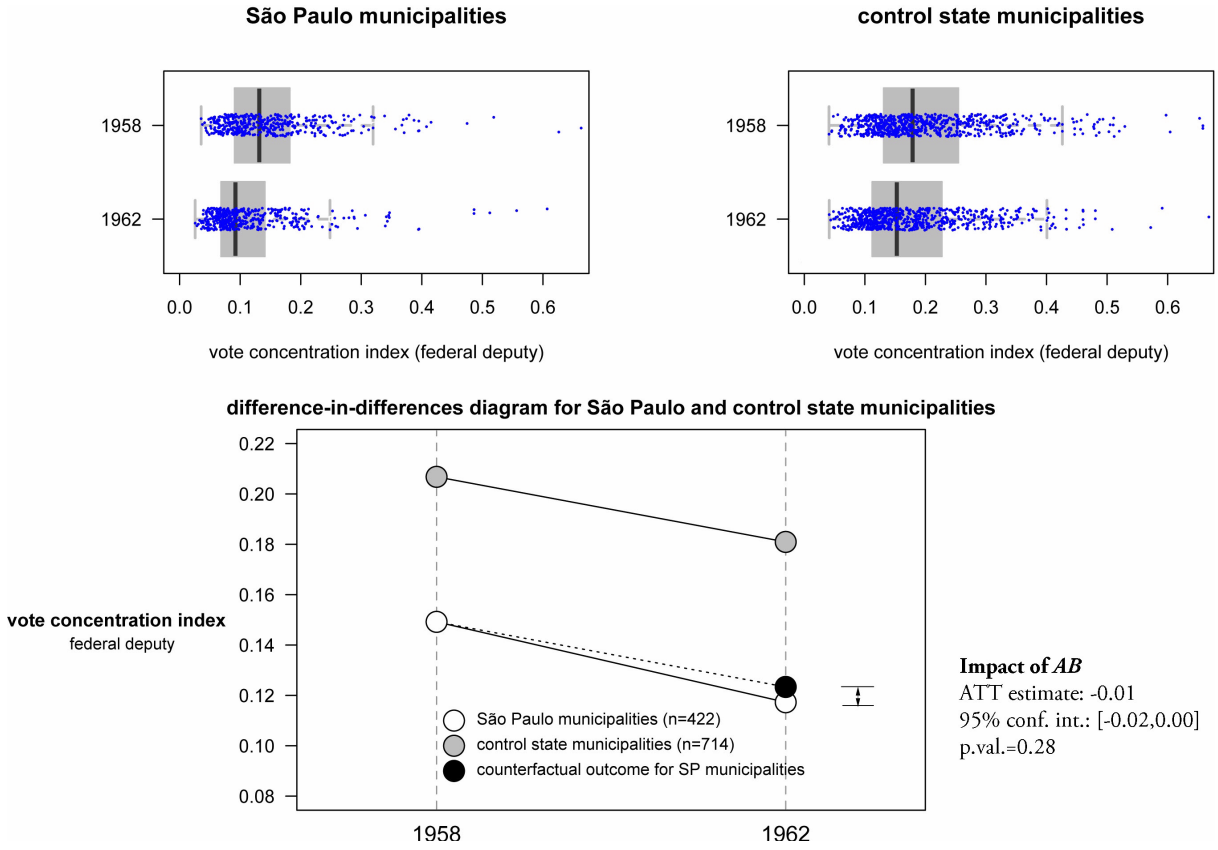


Note: The upper panels depict box-and-whisker plots and jitterplots of the municipality-level difference between the ideological center of gravity in the federal deputy contest versus the senate contest occurring in the year indicated. The bottom panel shows that municipalities in the interior of São Paulo, which had the *AB* in place in 1958 and 1962 for the senate and in 1962 for the federal deputy contest, experienced a significantly greater ideological shift to the Left in federal deputy contests vis-a-vis senate contests from 1958 to 1962 than did municipalities in the interior of the control states (Bahia, Paraíba, Paraná, Pernambuco, Piauí, Rio Grande do Sul, Rio de Janeiro), which only had the *AB* in place for the senate contests during this time.

We next turn our attention to the impact of the *AB* on our proxy for broker control, the vote concentration index. It is important to recognize that this variable is constructed based upon the *valid votes* cast for all candidates within a given municipality. As a consequence, it can be thought of as a measure of broker influence over the vote choices of individuals who cast their votes correctly, i.e. individuals who were able to cast votes that pasted muster with electoral authorities and thus counted towards the final totals that determined the election of candidates.

Figure 4 displays the manner in which this variable changed over time in the municipalities belonging to the treatment and control group, respectively. There was a slight decline in municipal-level vote concentration in both São Paulo and the control states, indicating a marginal increase in the competitiveness of elections at the local level. However, the magnitude of the change was fairly small in both instances. For municipalities in the state of São Paulo, the average value of the *VCI* declined from 0.15 in 1958 to 0.12 in 1962. For municipalities in the control states, the average value of the VCI declined from 0.21 to 0.18 during the same period. Thus, the naïve difference-in-differences estimate of the ATT is equal to -0.01 (rounding to the second decimal), with a 95% confidence interval equal to [-0.02,0.00] and a p-value of 0.28.

Figure 4. The Estimated Impact of the *AB* on Municipal Vote Concentration, (Non-state Capitals, 1958-1962) Raw Estimates (no Conditioning on Covariates)



Note: The upper panels depict box-and-whisker plots and jitterplots of the municipality-level vote concentration index in the federal deputy contest occurring in the year indicated. The bottom panel shows that municipalities in the interior of São Paulo, which had the *AB* in place for the federal deputy contest in 1962 but not in 1958, experienced a slighty greater decline in the vote concentration index than did municipalities in the interior of the control states (Bahia, Paraíba, Paraná, Pernambuco, Piauí, Rio de Janeiro, Rio Grande do Sul), which did not have the *AB* in place for federal deputy during either year.

What these results seem to indicate is that there was no radical reduction in the capacity of Brazil's *coronéis* to control the (valid) vote as a consequence of the introduction of the *AB*. Munic-

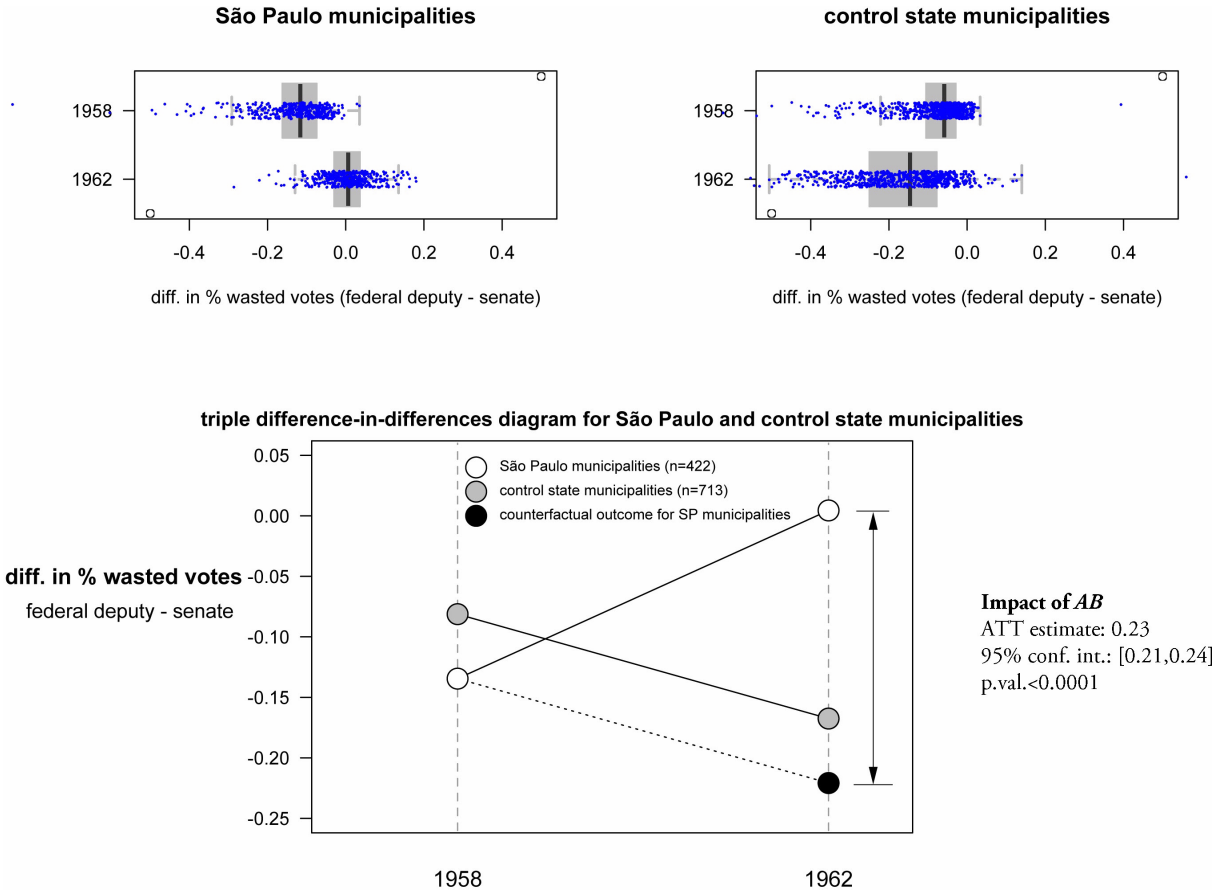
ipalities which conducted federal deputy elections using the *AB* did not experience a significantly larger shift towards more competitive elections at the local level than did municipalities which conducted said elections using the old candidate printed ballots. This has important implications for the mechanism by which the *AB* may have shifted the ideological balance of power in the party system. In particular, it casts doubt on the claim that the *AB* shifted the party system to the Left because effective vote secrecy liberated the clients of local notables to vote as they wish. If this were indeed true for the elections studied here, then the adoption of the *AB* should have brought about a marked reduction in the concentration of the vote, as formerly captive electorates became free to vote for the candidates that they, and not the local boss, most highly favored. As it stands, the measured effect is small in magnitude and only marginally statistically significant.

The lack of evidence for the aforementioned mechanism naturally raises questions. If the *AB* did not shift the party system to the Left because it caused local notables to lose their persuasive capacity vis-a-vis clients, then how do we explain the substantial move to the Left that the *AB* appears to have engendered in Brazil?

Addressing this question brings us to the most provocative findings of the paper. Figure 5 depicts the manner in which the percentage of wasted votes evolved as a function of the introduction of the *AB*. In the municipalities within São Paulo, one observes a remarkable shift. In 1958, when the *AB* was in place for senate elections but not federal deputy elections, on average the percentage of wasted votes in senate contests was substantially greater than that encountered for federal deputy contests (24% vs. 11%). In 1962, when the *AB* was in place for both types of contests, on average the percentage of wasted votes in the two types of contests was nearly identical (33% vs. 34%). In the control state municipalities, on the other hand, one finds a different pattern. In 1958, as in the case of São Paulo, on average the percentage of wasted votes in senate contests was substantially greater than that encountered for federal deputy contests (16% vs. 8%). In 1962, with the institutional rules in these municipalities staying fixed, one continues to observe a substantially greater percentage of wasted votes for senate contests than for federal deputy contests (29% vs. 12%).

By comparing the over time difference in the institutional differences across treatment and control units, one calculates a naïve estimate of the ATT equal to 0.23. This quantity is very precisely estimated, having a confidence interval of [0.21,0.24] and a p-value which for all intents and purposes is zero. It is also astounding large. On the basis of this estimate, one would conclude that the introduction of the *AB* on average increased wasted votes as a percentage of total votes cast in federal deputy elections in municipalities in the interior of São Paulo by 23 percentage points. To put this number in perspective, the top vote getting list in the entire state of São Paulo in 1962 only received 17% of total votes cast in the federal deputy election. In other words, the

Figure 5. The Estimated Impact of the *AB* on Wasted Votes, (Non-state Capitals, 1958-1962) Raw Estimates (No Conditioning on Covariates))



Note: The upper panels depict box-and-whisker plots and jitterplots of the municipality-level difference between the percentage of wasted votes in the federal deputy contest versus the senate contest occurring in the year indicated. The bottom panel shows that municipalities in the interior of São Paulo, which had the *AB* in place in 1958 and 1962 for the senate and in 1962 for the federal deputy contest, experienced a significantly greater increase in the difference between the percentage of wasted votes cast in federal deputy contests versus senate contests from 1958 to 1962 than did municipalities in the interior of the control states (Bahia, Paraíba, Paraná, Piauí, Pernambuco, Rio Grande do Sul, Rio de Janeiro), which only had the *AB* in place for the senate contests during this time.

AB increased the percentage of wasted votes cast by an amount greater than the total percentage of votes being tallied by the country's major party organizations!

These results suggest that the *AB* almost certainly had a major disenfranchising effect on the Brazilian electorate. In order to assess the relevance of this consequence of the *AB* for the leftward shift in the direction of the party system, we need to identify the voters who were most strongly affected by ballot reform and provide a sense of the historic voting patterns of these individuals. Subsequent sections of the paper take up this task. Before addressing this issue, however, we reassess the impact of the *AB* on our outcomes by properly conditioning on socio-economic and

demographic features of municipalities that may systematically differ across our treatment and control groups.

Estimates with Covariate Conditioning. The state of São Paulo is different from other states in Brazil in a number of important ways. It is the country's most populous state and it has the largest economy of any Brazilian state by far. Moreover, São Paulo is among the country's most educated states, with an extensive university system, a large industrial base, and a well developed service sector. Of course, São Paulo, like all Brazilian states, is highly diverse: it contains municipalities with extremely high levels of wealth and human capital and municipalities with substantially lower levels of the same.

In order to make certain that our estimates of the causal effect of the *AB* are not being driven by differences in the baseline characteristics of municipalities in São Paulo and the control states, this section of the paper presents ATT estimates based upon explicitly conditioning on such characteristics. Since the paper's triple differencing strategy should alleviate most concerns about confounding, we were fairly selective in our use of covariates. Specifically, we chose to condition on four key demographic and socioeconomic indicators (all variables were measured in 1960): 1) the population size of the municipality; 2) the literacy rate in the municipality; 3) the proportion of permanent homes with a radio (a proxy for access to political information); and 4) the proportion of the working age population employed in industry.

Table 1 depicts the means of these indicators across our treatment and control groups. There are indeed some stark differences across the groups. For instance, the average literacy rate for the São Paulo municipalities is substantially higher than that for the control municipalities (60% vs. 42%), as is the average percentage of homes with a radio (40% vs. 18%). Fortunately, the table also shows that the conditioning strategies adopted by the paper were able to produce matched control groups which approximated fairly closely the characteristics of the treatment municipalities. By selectively weighting municipalities within the treatment group, these algorithms help ensure that the paper's estimates of causal effect are based upon a comparison of units which are reasonably similar.

Figure 6 presents dotplots of the ATT estimates and their 95% confidence intervals for each outcome examined in the paper along with each covariate conditioning method. The basic story told by the estimates in the figure is consistent with the findings based on an examination of the raw data. The introduction of the *AB* in federal deputy contests in São Paulo produced a substantial increase in Left voting and correspondingly moved the ideological center of gravity from Right to Left. These effects were estimated to be statistically significant and substantively large, irrespective of the particular covariate conditioning technique that was utilized. On the contrary, there was little evidence that the introduction of the *AB* had an impact on the concentration of the vote. Although the negative sign of the estimated ATT was consistent with theoretical expectations throughout, in

Table 1. Covariate Means Across Treatment and Control Groups (Before and After Conditioning)

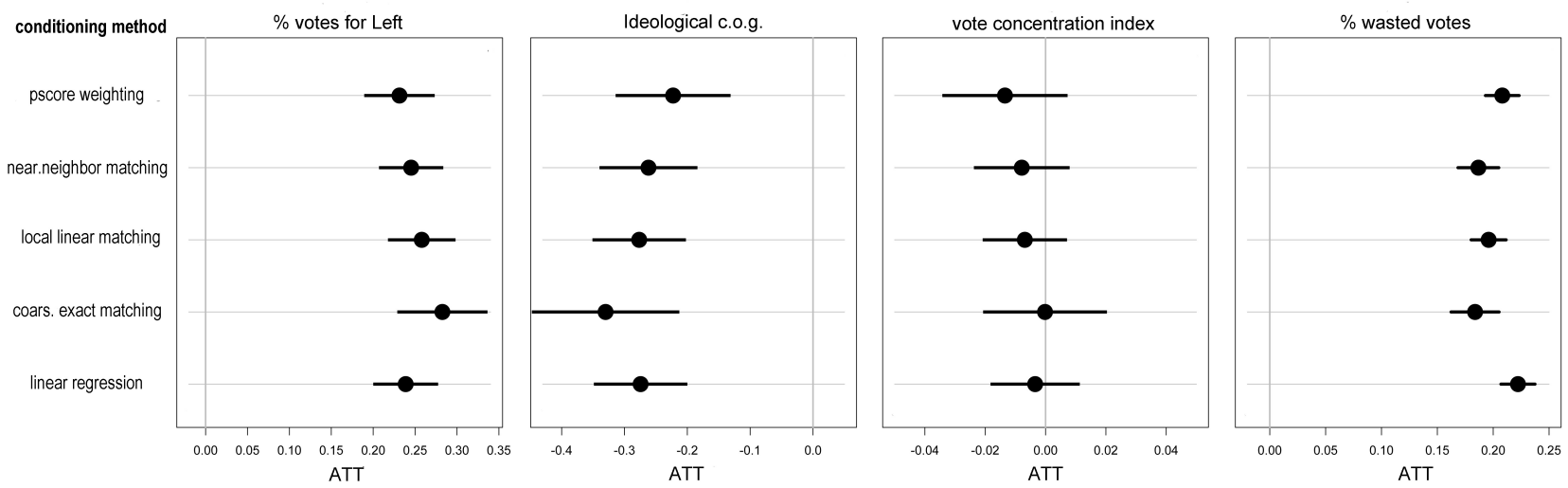
	raw data		p-score weighting	nearest neighbor matching	local linear matching	coarsened exact matching	
covariate	treated	control	control	control	control	treated	control
population	21306	32068	22565	25319	23338	29986	31129
literacy rate	59.7%	42.3%	68.3%	62.6%	63.5%	59.3%	56.2%
homes w/ radio	40.4%	17.8%	50.3%	40.9%	41.5%	40.9%	35.6%
working age pop. in industry	4.1%	2.2%	5.1%	3.4%	3.9%	4.7%	3.6%

Note: Nearest neighbor matching was conducted with on an estimated propensity score and was with replacement. Local linear matching, also using an estimated propensity score, employed a bandwidth parameter equal to .8. The coarsened exact matching procedure exactly matched treatment and control units based upon the deciles of the literacy rate as well as the 5th, 10th, 25th, 40th, 60th, 75th, 90th, and 95th percentiles of the other covariates. Treatment and control units without exact matches were discarded from the analysis.

no case could the null hypothesis that the estimated impact of the *AB* on vote concentration was zero be definitively rejected. Finally, the findings on wasted votes remained exceptionally stark. The introduction of the *AB* clearly engendered a massive increase in the percentage of wasted votes cast, with point estimates of the effect ranging from 18% to 22% across estimators. As before, these estimated effects had extremely narrow confidence intervals. In sum, the *AB* disenfranchised a sizeable segment of the electorate and shifted valid voting patterns to the Left, but it did not appear to have any immediate effect on the persuasive power of local brokers.

Assessing the Implications of Disenfranchisement for Left-Right Voting. The results presented thus far beg an obvious question: could the substantial disenfranchising effect of the *AB* be responsible for the observed leftward shift in valid voting patterns? In order to address this question, it is necessary to decompose the impact of the *AB* by studying its influence within distinct subgroups of the electorate. According to both extant theory and basic logic, the characteristic of voters most relevant in explaining the potentially differential effect of the *AB* on effective political participation is the underlying level of functional literacy. For voters with finely tuned literacy skills, the requirement that they write the name or number of their favored federal deputy candidate may not have been a particularly daunting challenge. For voters whose maximal literacy skills

Figure 6. The Estimated Impact of the *Ab* on Left-right Voting, Broker Power, and Effective Political Participation (Non-state Capitals, 1958-1962) Conditioning on Covariates Using the Method Indicated

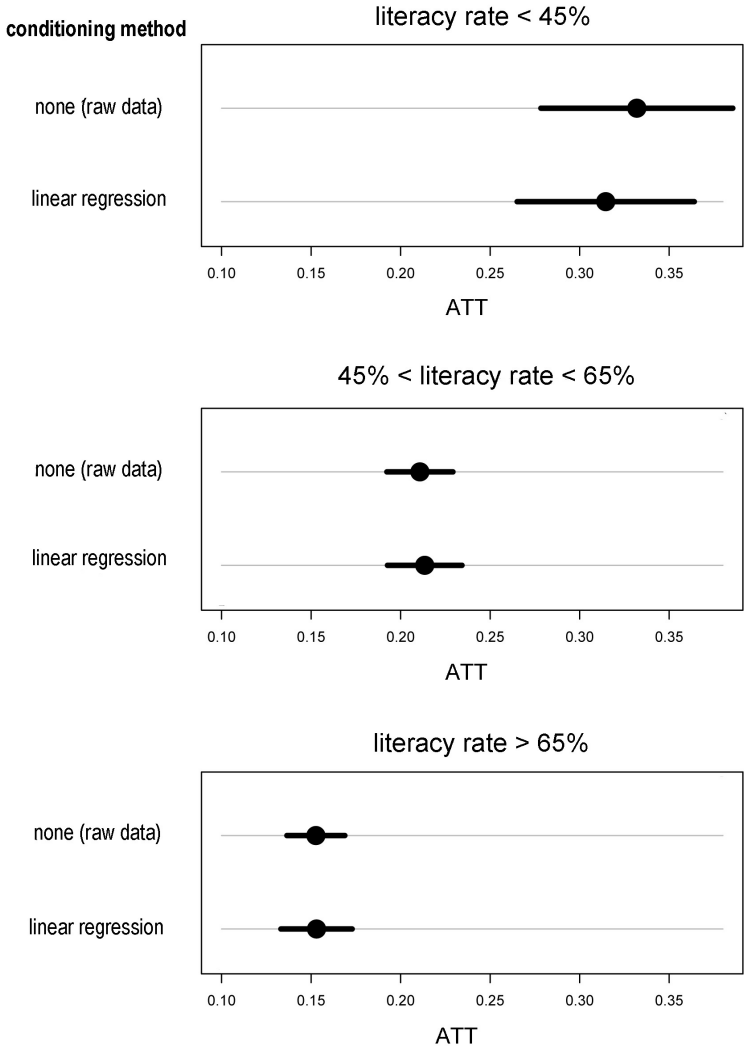


Note: ATT point estimates are denoted by black circles; 95% confidence intervals are denoted by black lines.

consisted of nothing more than at one time being able to sign their name in front of a judge, the same requirement may well have been insurmountable.

In order to evaluate if the *AB* had differential effects on effective political participation by literacy, we divided the sample into three subsamples whose boundaries roughly correspond to the terciles of the literacy rate. Within each subsample, we then calculated the ATT for the impact of the *AB* on wasted votes by using raw averages and by conditioning on covariates using linear regression. Naturally, one would expect that the magnitude of the impact of the *AB* on wasted votes would be larger in municipalities where levels of literacy were low than in municipalities where they were high. Figure 7 presents the findings..

Figure 7. The Subgroup Specific Impact of the *AB* on Wasted Votes (Subgroups Defined by Terciles of the Literacy Rate) Triple Difference-in-differences



Note: ATT point estimates denoted by black circles; 95% confidence intervals denoted by thick black lines.

We find evidence of an extremely strong differential effect of the *AB*. In municipalities where the literacy rate was the lowest (less than 45% literate), the estimated impact of the *AB* on wasted votes was approximately twice as large as the estimated impact of the *AB* in municipalities where the literacy rate was the highest (greater than 65% literate). Moreover, as expected, the estimated effect of the *AB* in the middle subsample was in between those of the two subsamples in the extremes. The absolute magnitude of the impact of the *AB* on wasted votes within the least literate subsample was truly striking: in these municipalities, approximately a third of the otherwise correctly voting public cast a wasted vote due to the introduction of the *AB*

Given these big differences in the effect of the *AB* on wasted votes across groups of municipalities defined by the literacy rate, the disenfranchising effect of the *AB* could certainly in theory explain the leftward shift in valid voting patterns, so long as there was also strong evidence that illiterate voters had a tendency to cast their lot with the parties of the Right. Let us consider what the data have to say in this regard.

Table 2 presents the results of a series of linear regressions which regress the ideological center of gravity for federal deputy contests held using candidate printed ballots onto the literacy rate and the other demographic variables utilized in our analysis. Such regressions can help reveal whether or not illiterate voters had a strong tendency to vote with parties of the Right prior to the adoption of the *AB*. As it turns out, our findings are unequivocal in this respect. Higher levels of literacy were strongly negatively and statistically significantly associated with the ideological center of gravity, meaning that municipalities with relatively many literate voters tended to vote for the Left whereas municipalities with relatively many illiterate voters tended to vote for the Right. In fact, in the 1958 election the literacy rate alone explained 27% of the variance in the ideological center of gravity. The findings for the 1962 election, for which we exclude the state of São Paulo due to its adoption of the *AB* in that year, are similar in the tight linkage they reveal between the literacy rate and ideological voting patterns.

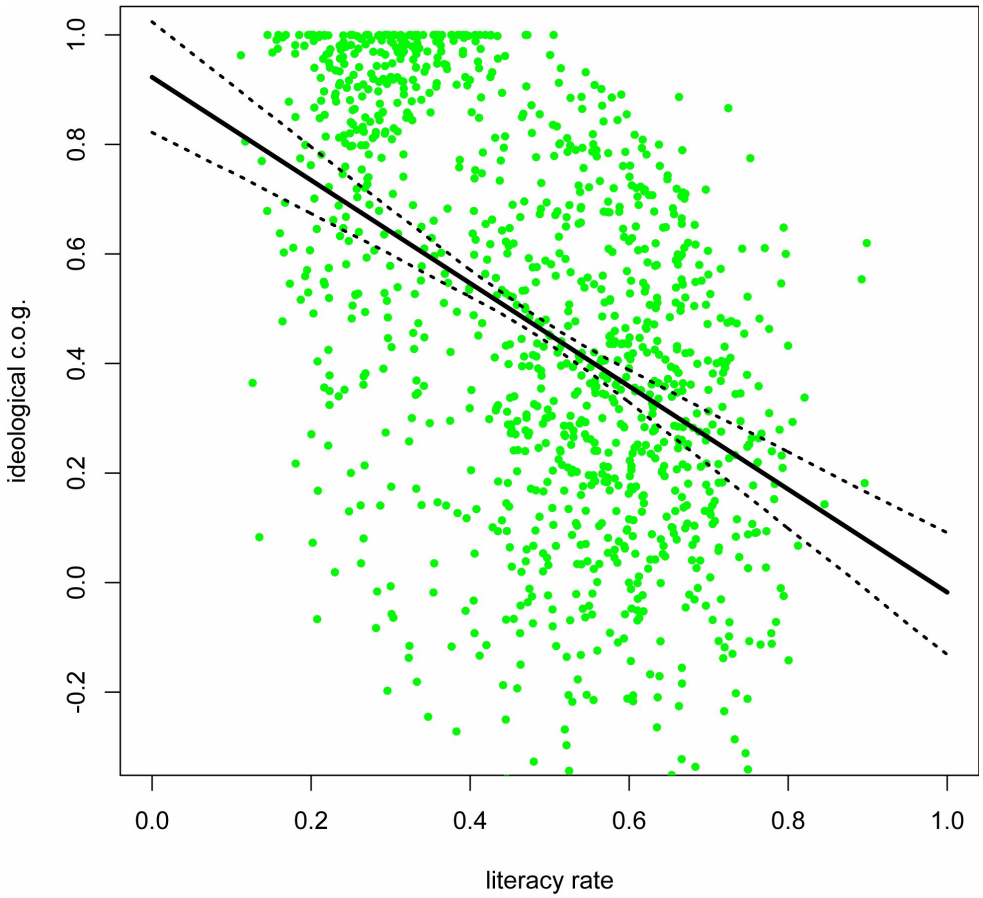
Figure 8 provides a visualization of the conditional relationship between the literacy rate and the ideological center of gravity, using the estimates presented in the table for model 2. Keeping covariates fixed at their sample means, an increase in the literacy late from the sample minimum (0.11) to its sample maximum (0.90) is associated with a reduction in the ideological center of gravity from 0.82 (nearly total domination of the vote by Right parties) to 0.07 (almost an even split of the vote between Right and Left). In other words, municipal-level patterns of illiteracy moved in lockstep with Right versus Left party voting under Brazil's old candidate printed ballot system.

Although these findings are highly suggestive, it is well known that ecological associations do not always provide an accurate guide to the behavior of individuals (Robinson 1950). Recognizing this, we buttress our regression analyses with the use of ecological inference techniques

Table 2. Relationship Between Literacy Rate and the Ideological Center of Gravity (Federal Deputy Contests Using Candidate Printed Ballots)

	1958 Federal Deputy Election (all municipalities)				1962 Federal Deputy Election (São Paulo excluded)			
	model 1		model 2		model 3		model 4	
	coefficient s.e.	t-stat.	coefficient s.e.	t-stat.	coefficient s.e.	t-stat.	coefficient s.e.	t-stat.
literacy rate	-1.1 (0.05)	-20.48	-0.94 (0.10)	-9.24	-0.93 (0.07)	-13.36	-0.44 (0.12)	-3.57
ln(population)	–	–	-0.05 (0.01)	-4.80	–	–	-0.04 (0.02)	-2.53
homes w/ radio	–	–	-0.19 (0.09)	-2.13	–	–	-0.53 (0.13)	-4.40
working age pop. in industry	–	–	0.33 (0.23)	1.43	–	–	-0.08 (0.38)	-0.21
	N=1137 R^2=0.27		N=1137 R^2=0.29		N=715 R^2=0.20		N=715 R^2=0.23	

Figure 8. Estimated Relationship Between Literacy Rate and Ideological Center Of Gravity (Federal Deputy Election)



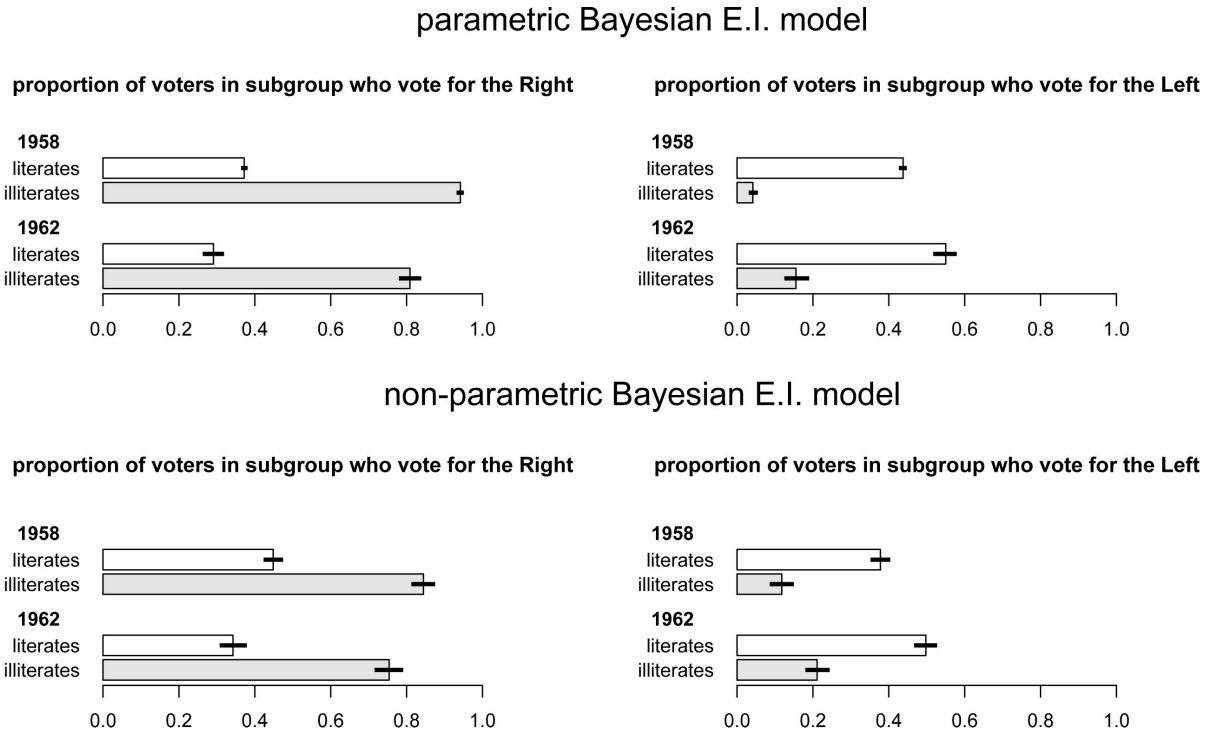
Note: 95% confidence intervals denoted by dashed black lines; green dots present bivariate scatterplot.

which allow one to explicitly estimate the proportion of the vote cast for Right and Left parties by literacy status in the states included in our sample. In particular, we employ the Bayesian ecological inference framework presented in Imai, Lu, and Strauss (2008). This framework consists of two main models: a parametric model which utilizes a bivariate Normal data generating process for the (logit transformed) vote proportions and a non-parametric model which utilizes a mixture of bivariate Normal densities (with the number of clusters optimally selected given the data) for the same.

Figure 9 presents barplots of our estimates from both of these ecological inference models. They clearly confirm the tendency suggested by the municipal-level regressions, namely, that illiterate voters were more likely to vote for the Right than literate voters and that literate voters were more likely to vote for the Left than illiterate voters. According to the parametric model, in the 1958 federal deputy election the percentage of illiterate voters casting their vote for the Right was 94%, compared to an estimate of 37% of literate voters. Naturally, the proportions were reversed

when considering votes cast for the Left. In this election, only 4% of illiterate voters were estimated to have cast their votes for the Left, whereas 44% of literate voters were estimated to have done so. The non-parametric model suggests differences that are somewhat less stark but nevertheless quite impressive. Again focusing on the 1958 election, this model produces an estimate of 85% of the votes of illiterate voters going to the Right and an estimate of 48% of the votes of literate voters doing the same. As far as the Left was concerned, 12% of illiterate voters were estimated to haved voted for parties of this ideological leaning, compared to 38% of literate voters. The findings from the 1962 election are quite similar in the patterns they reveal about literacy status and Right versus Left voting.

Figure 9. Estimated Proportions of Voters Casting Votes for Right and Left Parties by Literacy Status and Election Date Federal Deputy Elections of 1958 (All States) and 1962 (Excluding São Paulo)



Note: Estimates denote the proportion of the vote cast for Right and Left parties, respectively, by literate and illiterate voters in the average municipality in the sample. Ninety-five percent confidence intervals are denoted by thick horizontal lines. Quantities of interest were calculated using the ecological inference models presented in Imai, Lu, and Strauss (2008), which are implemented in the R software package eco (Imai, Lu, and Strauss 2011). In total, 25,000 draws from the posterior density were calculated, with a burn-in period of 10,000 draws. Of the remaining draws, every sixth draw was retained.

Taken together, the municipal-level regressions and ecological inference estimates tell a simple but important story: under the old candidate printed ballot system, illiterate voters overwhelmingly cast their lot with the parties of the Right. The potential ramifications for the ideo-

logical balance of power in the party system of any ballot reform that effectively disenfranchised illiterates were quite large indeed

These results help us close the circle in terms of explaining why the *AB* caused a shift in fortunes in favor of the Left. Ballot reform created a considerable obstacle to voting correctly, one which was frankly insuperable for a large segment of voters with minimal literacy skills. By in large, these minimally literate voters were clients of Brazil's rural bosses, who, as large landowners and employers, directed their dependents to vote for candidates belonging to the parties of the ideological Right. After reform, the clients of the rural bosses who were able to vote did not appear to radically break from the dictates of the bosses–municipal vote concentration remained steady. However, because so many of the traditional clients of the rural bosses, and *ipso facto*, Right parties, could no longer vote correctly, the relative importance of this segment of the electorate had declined considerably. Statewide elections thus came to be won or lost more and more in the urban centers and less in the countryside. In this way, the Right began to lose support not because the local bosses lost their persuasive power, but rather because they lost their electorates. With all said and done, the *AB* did appear to weaken the electoral relevance of clientelism in Brazil, but it did so in a curious and somewhat insidious fashion: by effectively taking the ballot out of the hands of the clients.

8 Conclusion

With a few important exceptions, discussions of the impact of the *AB* have concentrated almost entirely on the downstream implications of the degree of effective vote secrecy it provides but have largely ignored the manner in which it may affect the accessibility of the vote. This study's examination of Brazil's historical experience with the *AB* suggests that taking accessibility issues for granted is a mistake: the introduction of the *AB* created a massive increase in the proportion of wasted votes, one that was especially acute in zones of high illiteracy that had traditionally served as the bastions of Right politicians. Changes in vote accessibility thus had an important impact on the ideological balance of power in the party system. The larger lesson here is that, depending upon the social, institutional, and educational context in which ballot reform is to be implemented, there may be an important trade-off between ballot secrecy and accessibility.

Ultimately, the intensity of this trade-off depends on two key features of a polity: its underlying level of literacy and its electoral institutions. A polity's level of literacy is clearly important because this will determine the capacity of citizens to engage with and understand a standardized ballot. Polities which make the transition to the *AB* after their citizens have attained a high level of literacy are unlikely to experience the significant disenfranchisement effects this paper has uncovered in the case of Brazil and that earlier studies identified in the US South. On the other hand, it is not necessarily the case that countries with relatively low levels of literacy will experience equally

large disenfranchisement effects if and when they adopt the *AB*. The magnitude of any such effects will be determined to a large extent by a country's system of electoral rules, in particular: 1) whether or not the rules governing legislative elections allow citizens to vote for candidates instead of parties; and, if voting for candidates is permitted; 2) the degree to which electoral rules limit the set of candidates to a reasonably small number.

For countries with significant pockets of illiteracy, the use of the *AB* presents the lowest risk of disenfranchisement if the electoral system requires voters to choose among parties or relatively few candidates during legislative contests. This would be the case, for example, in closed list proportional representation systems, majoritarian (first past the post) systems, or very low district magnitude preferential list systems which permit voters to choose from a limited number of candidates. The reason these types of systems present a lower risk of disenfranchisement is that they permit the construction of official ballots which are easy to understand even for illiterate or poorly educated voters. For instance, if voters vote only for parties, official ballots can contain both the party name and its symbol next to the area where the voter marks her preference, thus making the act of voting intelligible for those who cannot read written text. Similarly, if voters choose between a small number of candidates, then the photo and/or party symbol of each candidate may be placed next to her name on the ballot itself. Official ballots with these features are currently used in most countries where literacy rates are low, including many countries in regions such as Africa, Central Asia, and Latin America.

The challenges for effective political participation associated with the adoption of the *AB* in polities with low literacy are much greater if those polities also have electoral systems which encourage many legislative candidates to run in a district at a single time. Particularly conducive to the emergence of a plethora of candidates are prefential list systems with high magnitude districts, which typically allow parties to run at least as many candidates as there are seats up for grabs in a district. This, of course, describes the Brazilian scenario. The existence of open list proportional representation in medium to large magnitude districts for proportional elections in that country meant that it would have been difficult, in the extreme, to include all the options available to voters (candidate names and likenesses) on the newly created official ballot. The solution to this challenge chosen by electoral engineers was to create an official ballot that forced voters to write in the name or number of the candidate they wished to vote for, an especially daunting task for those individuals with limited literacy skills. Yet as problematic as this choice clearly was, it is not clear that a preferrable alternative was available given the nature of the country's electoral system.

Consider the recent experience of the Democratic Republic of the Congo, which rolled out the *AB* in general elections in 2006. The great majority of the country's legislators attain office by running on open party lists in multimember districts. Thus, as in Brazil, there are vast numbers of legislative candidates for whom voters may vote in a district at a single time. The country combines

this with a very low literacy rate (67%) and, given a long history of autocratic government, a body of politicians with low name recognition. Given the latter set of circumstances, the Congo opted to run its elections with official ballots containing the names and photos of all candidates contesting the elections in a given district. The result has been ballot books the size of newspapers, in some cases running up to 56 pages long. Predictably, election administration has been both extremely expensive and chaotic, with many citizens discouraged from voting by long lines caused in part by the time required to make sense of such bewildering voting instruments.

The Brazilian and Congolese experiences with ballot reform illustrate the point that, unlike for electoral systems with only a party vote and/or high institutional barriers to entry for candidates, in systems that permit vote choice over very large numbers of candidates there is no easy technical fix that eliminates challenges to effective political participation when making the transition to the *AB*. Instead of bringing party or candidate ballots to the polls, the adoption of the *AB* means that voters have to scan through long lists of written names, work their way through exceptionally long name-photo combinations, or write in candidate identifying information themselves. All such options present non-negligible risks of voter disenfranchisement.

Fortunately, the countries which have not yet adopted the full *AB*–of which there are ten (Argentina, France, Greece, Guinea, Latvia, Mali, Norway, Spain, Sweden, Uruguay)–present a relatively favorable environment for reform should they choose to move in that direction. The European and Latin American cases among this group have extremely literate populations for whom a standardized ballot should be easily accessible. Indeed, Argentina recently experimented with the introduction of the *AB* in two provinces (Cordoba and Santa Fe), with a preliminary investigation of these experiences finding that that voters consider the *AB* to be easy to understand and that large waves of blank and null votes have not followed its introduction (Pomares, Leiras, Page, Lenarduzzi 2011). The two holdouts for which the potential disenfranchisement effects of the *AB* would loom largest, Guinea and Mali (with literacy rates equal to 40% and 26%, respectively), have closed party list systems for their national assemblies. Thus, should these countries choose to adopt the *AB*, electoral authorities will not be between Scylla and Charybdis to the same degree as were their counterparts in Brazil and the Congo. With sufficient attention paid to voter education, a simple uniform ballot containing the names and symbols of all registered parties may be able improve secrecy without producing a major increase of wasted votes.

As is always the case, there are outstanding issues raised by this paper. Foremost among these is the question of why broker power–as manifested by the vote concentration index–was not undermined more by the introduction of the *AB*. We believe that a recent literature on clientelism and outcome-contingent contracts helps address this question (Smith and Bueno de Mesquita 2012, Gingerich and Medina forthcoming). Although the *AB* inhibits vote monitoring at the individual level, it does not do so at the collective level. If voters are grouped into significantly small elec-

toral jurisdictions and have social identities that correlate highly with partisan preferences, then vote brokers may maintain their persuasive power in spite of the *AB* by making benefits to voters contingent upon victory by a recommended candidate as well as upon the observable actions (i.e. turnout and abstention) taken by voters of distinct social groups. Brazil's many sparsely populated municipalities and its very small electoral sections (the equivalent of a precinct, by law having between 50 and 300 registered voters in interior municipalities) certainly made such strategies feasible. While this work provides a logically coherent explanation for the persistence of brokerage after the introduction of the *AB*, it is important to note that its central propositions remain largely untested. An explicit empirical examination of how jurisdiction size affects the prevalence of vote brokerage under the secret ballot remains a fruitful avenue for future research.

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