

Exposing Corrupt Politicians:
The Effect of Brazil's Anti-Corruption Program
on Electoral Outcomes*

Claudio Ferraz
University of California, Berkeley
and IPEA

Frederico Finan
University of California, Berkeley

April 2005

PRELIMINARY DRAFT

Abstract

It is generally believed that improved voters' information enhances political accountability. In this paper, we exploit an unique natural experiment provided by Brazil's anti-corruption program to examine this claim. In April of 2003 as part of an ambitious anti-corruption program, the Brazilian government began to randomly audit the municipal expenditure of federally transferred funds. To promote transparency and accountability, the resulting audit reports are disseminated to the mass media. We exploit this randomized audit policy to test whether the dissemination of information about government corruption affects the incumbent mayor's probability of being reelected. We find that the media play an important role in disclosing this information to the voting public. In municipalities where radio stations are present and higher levels of corruption are revealed, the program reduces reelection rates by 32 percent. These findings highlight the importance of mass media in reducing informational asymmetries in the

*We are grateful to David Card, Ken Chay, Alain de Janvry, Seema Jayachandran, Ted Miguel, Enrico Moretti and Elisabeth Sadoulet for helpful conversations and suggestions. We thank participants in the Berkeley development lunch and workshop for comments and Yves Zamboni, from the Controladoria Geral da Uniao (CGU), for helping us understand the details of the anti-corruption program. Ferraz gratefully acknowledges financial support from CAPES-Brazil. Correspondence: Department of Agricultural and Resource Economics. 207 Giannini Hall, University of California, Berkeley, CA 94706. Email: ferraz@are.berkeley.edu; finan@are.berkeley.edu.

political process, thus enabling voters to not only hold corrupt politicians accountable but also reward non-corrupt politicians.

Key words: Corruption, information, elections, accountability, media

1 Introduction

Corruption in the public sector is a serious problem all over the world. It weakens democratic institutions, restricts public services, and lowers productivity undermining economic development.¹ Transparency guarantees, including the right to information disclosure, are argued to be one of the most powerful ways of preventing corruption (Sen (1999)). The World Bank, for example, asserts that “Transparency via public scrutiny has proven to be one of the most powerful forms of monitoring public officials...”². The argument behind this claim is that the disclosure of information not previously available to citizens has two potential effects. First, it empowers citizens to monitor the use of public funds and report its misuse to higher levels of government.³ Second, citizens with sufficient information (for example about the politician’s action) will be able to hold politicians accountable by voting corrupt politicians out of office (Besley (2004)). This reasoning has led several countries to experiment with transparency and information dissemination programs aimed at reducing corruption.⁴

Despite the strong advocacy for anti-corruption programs based on transparency and information dissemination, there exists little credible evidence that measures their impact. The reason for this is twofold: first, it is difficult to objectively measure corruption; second, the non-random nature of information disclosure makes the identification of its causal impact problematic.

In this paper, we overcome these data limitations and identification concerns to test whether the disclosure of information about political corruption affects the electoral outcomes of incumbent mayors. To do so, we exploit a unique quasi-experimental design provided by Brazil’s anti-corruption program. In April of 2003, Brazil’s federal government started to audit the federal funds transferred to municipal governments. As important features of the program, the municipalities were chosen at random together with the national lottery, and the audit reports were released to the general

¹See Bardhan (1997), Mauro (1995), Ades and Tella (1999); Graf Lambsdorff (2003)

²<http://www1.worldbank.org/publicsector/anticorrupt/politicalaccountability.htm>

³See Rose-Ackerman (2004).

⁴For example, Argentina began a program in 1999 called Cristal. This program disseminates online all information concerning the use of public funds in Argentina. This includes information not only about the amounts of money devoted to different programs, but also how these funds are administered. In 1998, the municipal government of Seoul, South Korea, started the program OPEN, which publishes a variety of information related to the services, permits and licenses issued by the local government. In addition to these programs, others exist in various states of India, as well as the in Philippines, Sri Lanka, and Colombia.

media. This randomized design and public dissemination allow us to compare electoral outcomes of incumbent mayors between municipalities that were audited and had corruption reports released and municipalities that were not audited.

Although this simple comparison identifies the average impact of the program on electoral outcomes, it does not capture how the effects vary according to two important aspects of the program. First, since the reports were divulged via the media, we expect a larger impact in regions where media sources are present to diffuse the audit reports. Second, we would expect audits that did not report any corruption in a municipality to have a very different effect on electoral outcomes compared to audits that reported severe corruption. A comparison between municipalities that were audited and those that were not fails to distinguish the type of information revealed by the audit report.

To address these issues we need to know the extent of corruption in both audited and non-audited municipalities. Although we only have corruption indicators for audited municipalities, the timing of the 2004 election and the release of the audit reports allow us to measure corruption for a group of municipalities that were audited, but had their corruption reports only released after the election. Because the order in which municipalities were selected was random, this group of municipalities constitute a valid counterfactual for the effect of information disclosure. Thus, we measure the program's effect by comparing, among the audited municipalities, those whose reports were released prior to election to those whose reports were released after the election, allowing the effect to vary by the degree of corruption and media availability.

Our main findings are as follows. We begin by showing that voters care and punish corrupt politicians. While often treated as a presupposition for several classes of political economy models, this has been a relatively unexplored empirical question due to the difficulty in obtaining objective corruption measures.⁵ In particular, we find that an increase in the number of corruption irregularities is associated with a 14 percent decline in the probability of being reelected.

In the reduced-form regressions, we compare electoral outcomes in municipalities that were

⁵Previous work focuses on studying how charges of corruption affect the vote totals of candidates running for election for the U.S. House of Representatives. Peters and Welch (1980) compare election outcomes of candidates accused of corruption to candidates who were not accused during elections held from 1968 to 1978 and find that candidates accused of corruption suffer an eight percent loss in their expected vote. Welch and Hibbing (1997) provide a follow-up study that confirm and update the previous results.

audited to those that were not, and find that, on average, the program did not affect the electoral outcomes of incumbent mayors. However, when we do take into consideration the important role that media plays in publicizing the information and the fact that the audit reports reveal different degrees of corruption, we find that the program did in fact have a significant effect on the reelection probabilities of incumbent mayors. In municipalities with higher levels of corruption and more media, the release of the audits decreased the probability of reelection by 13 percentage points, or approximately 32 percent.

Our findings contribute to two bodies of literature. First, it is related to studies that use micro-level data to assess the impact of anti-corruption programs. Di Tella and Schargrotsky (2003) study the impact of a corruption crack-down in the city of Buenos Aires. Using an auditing process induced by a change in government, they find that increasing monitoring decreases the price public hospitals pay for inputs. Reinikka and Svensson (2004) analyze the effects of an information campaign designed to reduce the diversion of public funds transferred to schools in Uganda. Using a difference-in-difference approach, they compare the capture of public funds in schools with access to newspapers to schools without access to newspapers before and after a large anti-corruption campaign. They find that schools with newspaper access received, on average, 13 percent more of their entitlement. They conclude that information allowed parents and teachers to exert pressure on local politicians and decrease corruption. Our paper, although related through the information dissemination mechanism, uses an identification strategy based on a randomized quasi-experiment which controls for any potential confounds associated with the endogenous acquisition of information. In a related paper Olken (2004) conducts a randomized field experiment in 608 Indonesian villages to analyze how different monitoring mechanisms might reduce corruption in infrastructure projects. His findings suggest that central auditing mechanisms are more effective to control corruption when compared to grass-root participation monitoring. We see our paper as complementary to these studies by providing evidence that information disclosure about corruption helps to reduce capture of public resources through an alternative mechanism: reducing asymmetrical information in the political process to enable voters to select “better” politicians.

This paper is also related to a second strand of the literature that explores the role of media in shaping public policy and influencing the political process. Several papers use cross-country data and show a negative association between well developed and free media and good governance

(Brunetti and Weder (2003); Ahrend (2002)). Nonetheless these studies do not provide evidence on the channels that lead media availability to affect governance.⁶ Recent contributions have started to fill this gap. Besley and Burgess (2002) focus on the role of the media in mitigating political agency problems by providing information to voters. They analyze the relief of shocks in India and show that in places with newspapers, governments are more responsive. In a related paper, Stromberg (2004) finds that U.S. counties with more radio listeners received more relief funds from the New Deal program. His results are consistent with a theory in which politicians target resources to voters that are better informed.⁷ Our results complement this literature by finding that the media plays an important role in exposing corrupt politicians in the context of an information based anti-corruption program and thus improves political accountability.

The remainder of the paper is organized as follows. The next section provides some theoretical background to demonstrate that the effects of information on political accountability can be ambiguous. Section 3 provides brief background on Brazil's anti-corruption program, and a description of the data used in the analysis. The paper's main empirical findings are presented in section 4 and section 5 concludes the paper.

2 Theoretical Background

This section reviews some of the theoretical literature that predicts how improved information might affect political accountability. We begin with a class of political agency models which provides a natural framework to investigate the role of information on political accountability. We then discuss the implications of improved information for models that depart from the rational voter assumption by assuming alternative learning mechanisms.

2.1 The Effects of Information in Political Agency Models

Political agency models provide a natural framework to investigate the role of information in enabling political accountability (see for example Barro (1970); Ferejohn (1986); Persson, Roland, and

⁶Besley, Burgess, and Pratt (2002) state that there is comparatively little work in the political economy literature that scrutinizes the role and effectiveness of the media in fulfilling this function.

⁷In small municipalities in Brazil, similar to rural areas in the U.S. in early 20th century, radio plays a crucial role as a media source and impacting citizens opinions and perceptions.[cite??]

Tabellini (1997)).⁸ In the simplest agency framework, citizens adopt retrospective voting strategies based on imperfect information about the politician's action or type. As voters are then left to infer either the politician's type or action, the politician can exploit this information asymmetry to appropriate rents. In these standard political agency models, better information can improve voters welfare by allowing them to discipline incumbents more tightly. These model will predict that releasing information about corrupt incumbent politicians before an election will, *ceteris paribus*, decrease their reelection chances.⁹

The effects of new information on political accountability become less clear when we combine both adverse selection and moral hazard into the political agency framework.¹⁰ In a simple model that incorporates both moral hazard and adverse selection, Besley and Smart (2003) show that more information need not be welfare improving for voters. Specifically, they provide the following example that illustrates their argument very well:

Consider a world in which politicians may be either corrupt or honest, and corrupt officeholders can escape detection and remain in office, as long as their corrupt activities are not too egregious. Suppose then that auditing technologies in government improved to the point that all corruption could be detected and revealed to voters, but not until after the fact. If corrupt politicians are indeed motivated only by private gain, their rational response must be to increase rent extraction before leaving office. Thus corruption among first-term incumbents would inevitably rise, but fewer corrupt politicians would remain in office, leading to an ambiguous effect on the average level of corruption.

While better information allows voters to select better politicians, it also reduces discipline and thereby increase first-term rent seeking. Given this tradeoff, more information may not be desirable for voters if the discipline effect dominates the selection effect.

⁸Persson and Tabellini (2000) and (?) provide excellent reviews of the political agency framework.

⁹Note that if the policy was announced in the beginning of the political term, it would also affect politician's equilibrium choice of rent extraction. This is because incumbent politicians always faces a choice between extracting maximal rents in the current period or showing restraint and continuing to enjoy rents in future.

¹⁰Initial efforts to model both adverse selection and moral hazard together in a political agency framework include Banks and Sundaram (1993) and (?).

2.2 Information and Learning with Behavioral Voters

An underlying assumption of traditional political agency models is that voters are rational and assimilate new information in an efficient and unbiased manner (often according to Bayes' rule). There is, however, a large and growing body of literature suggesting that individuals are selective in the manner in which they gather and process information. Beliefs, once formed, are slow to change as individuals interpret new information to confirm previously held convictions. Rabin and Schrag (1999) identify three different information-processing problems that contribute to confirmatory bias: interpretation of ambiguous evidence; interpretation of statistical evidence that assesses a correlation between events over time; and, interpretation of complex evidence that is then scrutinized and filtered differently according to whether the evidence is confirming or disconfirming.¹¹

If voters are in fact prone to confirmatory bias in processing information, then the effect of new information will depend on individuals' priors about corruption. For example, if voters believe that the incumbent is corrupt, then it is unlikely that they will vote for him even if the audits reveal no corruption. Theoretically, this implies that the release of information will have a minimal effect on electoral outcomes.

Although support for the confirmatory bias hypothesis has mainly originated from research in social psychology, there is a growing literature testing this hypothesis as it relates to economics and political science.¹² In their seminal study, Lord, Ross, and Lepper (1979) show using experimental subjects that prior beliefs on the death penalty influence how the subjects evaluated studies on the deterring effect of the death penalty on crime. Their experiment also provides evidence that the same ambiguous information can even have a polarizing effect as the beliefs of individual with initially different priors, move even further apart.¹³ In political science, for example, studies have shown that voters preference for a candidate largely determined who they felt won the presidential debate (Sigelman and Sigelman (1984) and Peffley, Feldman, and Sigelman (1987)). In an experiment using videotapes of political candidates, Rahn (1993) finds that partisan stereotypes have

¹¹One could argue that the information provided by CGU is less likely to result in confirmatory bias because the information was gathered from an independent source and summarized for the voting public.

¹²Rabin (1998) provides an excellent survey of the psychology literature as it relates to economics.

¹³The results of this experiment have been replicated and extended for perceptions about the harmfulness of coffee consumption (Kunda 1987); judgements about the safety of nuclear technology (Plous 1991); and the stereotyping of homosexuals (Munro and Ditto 1997).

considerable influence in political information processing. Recently, DellaVigna and Kaplan (2005) show that the introduction of the conservative Fox News Channel did not influence the Republican vote share in the 1996 and 2000 presidential elections. They interpret this as evidence consistent with the confirmatory bias hypothesis.¹⁴

2.3 Corruption Accusations and Individual Utility

In the previous theoretical frameworks voters are willing to punish corrupt politicians since corruption implies less availability of public goods. Nonetheless, sometimes voters might care about corruption, but also derive utility from private transfers. Under a political regime of clientelism, voters may be willing to trade-off the fact that a politician is corrupt for a certain policy stance or other desirable benefit (Rundquist, Strom, and Peters 1977). Thus, voters may knowingly vote for a corrupt politicians in exchange for particularistic goods and material benefits, as is commonly the practice in machine politics (Scott 1969). If some voters are compensated for corruption through increases in transfers or public good provisions, then providing information about corruption may also have a minimal effect on the incumbent’s electoral performance.

3 Background and Data

3.1 Brazil’s anti-corruption program

In January 2002, Luiz Inácio Lula da Silva became Brazil’s first left-wing president. Elected primarily on a political platform of social programs improvement and the reduction of hunger, one of his unexpected policies was the start of an unprecedented anti-corruption program based on the random auditing of municipal government’s expenditures.¹⁵ This anti-corruption program, which is implemented through the Ministry of Control and Transparency, has two objectives. First, to discourage misuse of public funds among public administrators due to the potential of future audits. Second, to foster civil society participation in the control of public expenditures. One of the main mechanisms to meet these objectives is the release of the audit findings on the internet and to media sources. The following quote from President Lula, extracted from the program inaugural speech, emphasizes the importance of this component: “I think the Brazilian society needs to understand

¹⁴Although they cannot reject the hypothesis that voters are sophisticated and filter out any media bias.

¹⁵In Portuguese the program is called *Programa de Fiscalização a partir de Sorteios Públicos*.

once and for all, that we are only going to be able to truly fight corruption when the civil society, with the instruments made available, can act as a watch dog.”¹⁶

The program started in April 2003 when the Brazilian government, through its governmental auditing office, Controladoria Geral da União (CGU), audited 26 randomly selected municipalities in each of Brazilian states. The program has since expanded to auditing 50 and later 60 municipalities per lottery, from a sample of all Brazilian municipalities with less than 450,000 inhabitants.¹⁷ The lotteries, which are held on a monthly basis at the Caixa Econômica Federal in Brasilia, are drawn in conjunction with the national lotteries. To assure a fair and transparent process, representatives of the press, political parties, and members of the civil society are all invited to accompany the lottery.

Once a municipality is chosen, the CGU gathers information on all federal funds transfers to the municipal government from 2001 onwards.¹⁸ Approximately 10 to 15 CGU auditors are then sent to the municipality to examine accounts and documents, to inspect for the existence and quality of public work construction, and delivery of public services. Auditors also meet with the local community members, as well as community councils in order to get direct complaints about any malfeasance.¹⁹ After approximately one week of inspections, a detailed report describing all the irregularities found is submitted to the central CGU office in Brasilia. These irregularities typically include diversion of public funds, noncompetitive bidding in the procurement contracts, cost-padding, and incomplete or non-utilization of public work. For each municipality audited, a summary of the main findings is posted on the internet and disclosed to main media sources. Furthermore, in extreme cases the report are sent to public prosecutors and to the legislative branch of the municipality. It is from these reports that we construct an objective measure of corruption.

¹⁶Source??

¹⁷This excludes approximately 8 percent of Brazil’s 5500 municipalities, comprising mostly of the state capitals and coastal cities.

¹⁸Brazil’s municipalities receive a significant share of the federal resources. They are responsible for a substantial share of public services’ provision, particularly in the areas of education and health. Currently, the 5,560 Brazilian municipalities receive on average \$35 billion per year from the federal government, which represents approximately 15 percent of federal government’s revenue. For comparison, fiscal decentralization in the world is on average 6 percent, while in other similar developing countries such as Mexico, for example, it is only 3 percent.

¹⁹These auditors are hired based on a public examination, and prior to visiting the municipality receive extensive training on the specificities of the sampled municipality. Also, there is a supervisor for each team of auditors.

3.2 Measuring Corruption from the Audit Reports

In this section we describe how we use the audit reports to construct an objective measure of corruption. As of March 2005, reports are available for the 556 municipalities that were randomly selected across the first 11 lotteries. Each report contains the total amount of federal funds transferred to the current administration and consequently audited, as well as, an itemized list describing each irregularity, in what sector it occurred (e.g. health, education, etc.), and in most cases the amount of funds involved. We then codified these reports into several categories; some indicating corruption while others simply exposing maladministration.²⁰ The data appendix provides specific examples of the audit reports and how we coded corruption.

Although local corruption in Brazil assumes a variety of forms, illegal procurement practices, diversion of funds, and the over-invoicing of goods and services are among the most common violations found in the audit reports.²¹ Illegal procurement practices typically consist of benefiting friendly or family firms with insider information on the value of the project, or imposing certain restrictions to limit the number of potential bidders. This was the situation in *Cacule*, Bahia, where the call for bids on the construction of a sports complex specified as a minimum requirement for participation that all firms needed to have at least R\$100,000 in capital and a specific quality control certification. Only one firm called Geo-Technik Ltda., which was discovered to have provided kickbacks to the mayor, met this qualification. While some procurement practices manipulate the process in favor of firms that offer potential kickbacks, other strategies are more blatant forms of fund diversions. In *São Francisco do Conde*, Bahia, for example, a health contract of R\$308,000 was awarded to a phantom firm: a firm that only exists on paper.

Other dominant forms of corruption include mayors diverting funds intended for education and health projects towards private goods, (e.g. the purchase of cars, fuel, apartments, or payment of their friends' salaries) or simply over-invoicing goods and services. For example, in *Paranhos*, Mato Grosso do Sul, R\$189,000 was paid to implement a rural electrification project. As it turns out, one of the farms benefitted by the project was owned by the mayor. Over-invoicing is typically found in the provision of medical supplies and the construction of public works.

Based on the audit reports, we define corruption as any irregularity associated with diversion

²⁰We also verified our coding by using independent research assistants to code the corruption indicator.

²¹These forms of corruption are also frequently discussed in the Brazilian literature on corruption. See for example ?); Fleischer (2002); Geddes and Neto (1999).

of funds, illegal procurement contracts, and over-invoicing of goods and services. These practices have not only been shown to be the most common forms of corruption in Brazil, but in many instances they are not necessarily mutually exclusive. In effect, over-invoicing and illegal procurement practices often serve as joint vehicles for funds diversion. We combined indicators of these three categories to best capture the municipality's corruption level.²² Specifically, we sum up for each municipality all the irregularities associated with each of these three categories and define this as our measure of corruption.

3.3 Complementary Data Sources

Three other data sources are used in this paper. The political outcome variables and mayor characteristics come from the Tribunal Superior Eleitoral (TSE), which provides results for 2000 and 2004 municipal elections. These data contain vote totals for each candidate by municipality, along with various individual characteristics, such as the candidate's gender, education, occupation, and party affiliation. With this information, we matched individuals across elections to construct our main dependent variable - whether the incumbent mayor was reelected - as well as other measures of electoral performance such as vote shares and win margin.

To capture underlying differences in municipal characteristics, we relied on two surveys from the Brazilian Institute of Geography and Statistics (Instituto Brasileiro de Geografia e Estatística (IBGE)). First, the 2000 population census provides several socioeconomic and demographic characteristics used as controls in our regressions. Some of these key variables include per capita income, income inequality, population density, share of the population that is urban, and share of the population that is literate. Second, to control for different institutional features of the municipality, we benefited from a 1999 municipality survey, *Perfil dos Municípios Brasileiros: Gestão Pública*. This municipal survey characterizes not only various aspects of the public administration, such as budgetary and planning procedures, but also more structural features such as the percentage of roads that are paved, whether the municipality has a judge, among others. Moreover, the survey provides our key measures of the availability of media, namely the number of radio stations and the

²²We actually categorized the irregularities into 11 categories including also: incomplete public works, non-existent or non-functioning social council, mismanagement of a social program, abandoned project (white elephant), clientelism, failure to spend the allocated budget, poor administration. See Ferraz and Finan (2005) for more details on how we coded the audit reports.

number of daily newspapers. The richness of this dataset allows us to comprehensively check the validity of our research design, and control for any potential confounding factors in the regressions that do not entirely rely on the randomization.

Basic descriptive statistics of our corruption measure, electoral outcomes, and municipal characteristics are shown in Table 1. As shown in the first set of rows, reelection rates for the past two elections are roughly 40 percent among the incumbent mayors that are eligible for reelection.²³ When we condition on mayors who seek reelection in 2004, the proportion of mayors that were reelected increases to 57 percent.²⁴ Although reelection rates have remained constant across elections, incumbents' vote shares and win margins have appeared to decrease on average from one election to the next.

The next set of rows in Table 1 present the constructed corruption measure.²⁵ Out of the 548 municipalities for which we can measure corruption, at least 76 percent had some incidence of corruption reported. Among these, the average number of corrupt irregularities found was 2.37. The majority of these violations stem from either illegal procurement practices or diversion of funds. The over-invoicing of goods and services appears much less frequently.

The table also shows the availability of media in these municipalities. While local AM radio stations exist in only 22 percent of the municipalities, the proportion of municipalities with a daily newspaper is almost 77 percent. Among those municipalities with an AM radio station 25 percent of them have more than one.

The rest of Table 1 summarizes a few of the key demographic characteristics of our sample. On average small municipalities in Brazil tend to be sparsely populated and relatively poor. The average per capita monthly income in our sample is R\$204, which is slightly less than the country's minimum wage set at R\$240 per month. Finally, 42 percent of the population of these municipalities live in the rural area.

²³In the 2000 election, every mayor was eligible for reelection. It was the first municipal election in which incumbents could seek a consecutive term. Ferraz and Finan (2005) exploit the introduction of the two year term limit to investigate how reelection incentives affect corruption levels.

²⁴At least 24 percent of first-term mayors chose not to run for reelection.

²⁵Given that 8 municipalities audited were also audited for a second time, we can measure corruption in only 548 distinct municipalities. Audited municipalities can be resampled after six lotteries have been drawn.

4 Results

4.1 The Relationship Between Corruption and Electoral Outcomes

Agency models of political economy are based on the existence of asymmetrical information between the politician and the voting public.²⁶ A policy implication of such models is that programs aimed at improving the information available to citizens might allow them to vote corrupt politician's out of office.²⁷ Nonetheless, the effectiveness of such programs depend on two things: first, that voters care about corruption; and secondly, that they hold politicians accountable for malfeasances. The difficulty in collecting reliable indicators of corruption has however encumbered the evaluation of these claims; but is a barrier that we overcome. In this section, we use the audit reports of municipalities that were audited prior to the 2004 municipal elections to test whether corruption affects the reelection outcomes. We provide suggestive evidence that Brazilian voters not only care about corruption, but punish corrupt politicians at the polls.

Figure 1 presents the relationship between the probability of reelection and the number of corruption irregularities discovered, where the plot represents a second-order polynomial fit and accounts for different state intercepts. The results of the 2004 elections suggest a strong negative correlation between reelection rates and the level of corruption committed by the incumbent's administration. Among the municipalities where not a single violation of corruption was discovered, 53.4 percent of the incumbents eligible for reelection were reelected. In contrast, among mayors that have committed at least one act of corruption, the proportion that were reelected is only 27 percent.

To explore the robustness of this figure to municipal and mayor characteristics, Table 2 presents the regression counterpart to this figure, along with other specification and sample checks. The table reports estimates from a linear probability model, where the dependent variable is whether or not the incumbent mayor was reelected in the 2004 municipal elections.²⁸ Columns (1)-(4) present estimates based on the sample of all incumbent mayors, while columns (5)-(8) repeat these specifications respectively but consider the sample of only those incumbents that sought reelection in

²⁶See Persson and Tabellini (2000) for a general reference.

²⁷Another potential implication of improved information is to allow the civil society to directly pressure politicians under a bottom-up approach. For some examples of programs that are thought to have helped reduce corruption see: <http://www1.worldbank.org/publicsector/egov.case>.

²⁸The marginal effects estimated with a Probit model are very similar.

2004. Panel A displays the estimated effect of the number of violations found to involve corruption on the probability of being reelected for various specifications. Column 1 for example presents the basic association between reelection and corruption after accounting for state intercepts. A principal concern with the relationship depicted in Figure 1 is the fact that it does not account for the mayor's provision of public goods. If in corrupt municipalities, fewer and lower quality public goods are provided then we will overestimate the effect of corruption on reelection. The specification in column 2 tries to account for this potential confound by including the number of violations associated with maladministration as a proxy for the supply of public goods and services.²⁹ Columns (3) and (4) correspond to specifications that control for differences in characteristics of the mayors and demographic and institutional features of the municipality. Sample sizes and R²'s are displayed below.³⁰

Focusing on Panel A and the sample of all incumbent mayors, we see that the estimated effect of corruption on the probability of getting reelected varies little across the various OLS specifications. Each specification is estimated with high precision and confirm the negative association between reelection and corruption depicted in Figure 1. In our most general specification (column 4), the OLS estimate is -0.055 and statistically significant at a 95 percent level of confidence. At a baseline of 0.39, this estimate implies that an increase of one corrupt violation is associated with a 14 percent decrease in the probability of reelection. For the sample of mayors that actually run for reelection, the point estimates are similar and again robust across specifications. Given a higher baseline of 56 percent, the effect of corruption is only about 9 percent. Given that those that decided not to run for reelection committed on average -.21 corrupt violations more than those that did, the difference between the two samples in the effect of corruption could represent a strategic decision on the part of the eligible mayors that decided not to run.

To examine a potential threshold effect, Panel B of Table 2 considers the effect of any corruption found on the probability of reelection. With this specification, the results are much more pronounced and again highly robust to the inclusion of control variables. In column (4) for ex-

²⁹We use the corruption reports to code a measure of maladministration. This include poor provision of health and education programs, among others. See Ferraz and Finan (2005) for a more detailed explanation of how we coded this variable.

³⁰Each sample has been restricted to the non-missing observations of the various control variables, so as to keep its size constant across specifications; this adjustment does not affect the results.

ample, the point estimate suggests that discovering some corruption in the municipality decreases reelection probabilities by approximately 54 percent.

In summary, we provide suggestive evidence based on the audit reports that voters do punish corrupt politicians. The fact that these reports were released to the public and that this negative relationship exists provides *prima facie* evidence that the Brazil's anti-corruption program is effective in enabling political accountability. The focus of the remainder of the paper is to test this claim.

4.2 Measuring the Effect of the Audits on Electoral Outcomes

The ideal experiment to test whether the release of information about municipal government corruption affects electoral outcomes would consist of auditing municipalities to record their corruption levels and then release this information to voters in a random subset of municipalities, conditional on the level of corruption. In such an experimental setting, a simple comparison of the electoral outcomes in municipalities where information was released to those where no information was released, estimates the causal effect of disclosing information about corruption on voting patterns. In practice however, this experiment is politically unfeasible. Our research design, which exploits the random auditing of the anti-corruption program, is perhaps the closest approximation one could get to such an experiment.

In this section we proceed as follows. First, under the assumption that the audits did not affect the electoral outcomes of non-audited municipalities, we compare electoral outcomes in municipalities that were audited prior to the 2004 elections with municipalities that were not audited to estimate the average effect of this audit policy. We then investigate how the effect of the program varies by the type information revealed and availability of media. Given that the use of media to publicly disseminate these audit reports is such a key aspect of the program, one would expect the program to have a more significant impact in areas where more corruption is revealed and media are present to diffuse such information.

To test this conjecture, we exploit the timing of the 2004 election and the release of the audit reports. Because the order in which municipalities were selected was random, the group of municipalities that were audited (and hence have information on their corruption levels) after the elections provide an ideal control group. Thus, we measure the program's effect by comparing those

whose reports were released prior to election to those whose reports were released after the election, allowing the effect to vary by the degree of corruption and media availability.

Basic Results

In this section, we exploit the randomized audits to estimate the effect of the program on the electoral outcomes of incumbent mayors eligible for reelection. Specifically, let y_{ms} denote the electoral outcome of the mayor in municipality m , state s in the 2004 election, and let A_{ms} be a binary variable that takes a value of one if the municipality was audited prior to the October 2004 elections and zero otherwise. The reduced-form effect of the audit can simply be computed as: $E(y_{ms}|A_{ms} = 1) - E(y_{ms}|A_{ms} = 0)$.

To compute this simple difference, we estimate the following regression model using OLS:

$$y_{ms} = \alpha + \beta A_{ms} + X_{ms}\gamma + \nu_s + \varepsilon_{ms}, \quad (1)$$

where X_{mj} is a vector of municipality and mayor characteristics that determine electoral outcomes, ν_s is a state fixed effect and ε_{ms} is a random error term for the municipality.³¹ The coefficient β , which measures the average effect of the program on the electoral outcomes of the incumbent politician, captures both the effect of being audited as well as the public release of this information.

Table 3 presents the OLS estimates of the effect of the auditing policy on the probability of being reelected, based on the estimation of equation 1. The results presented in columns (1)-(3) are estimated for the sample of incumbent mayors who were eligible for reelection in 2004, whereas columns (4)-(6) consider only those mayors who actually ran for reelection (approximately 75 percent of eligible mayors).³² The first specification (column (1)) controls for state fixed-effects but excludes other control variables. Column (2) presents an extended specification that includes various municipal characteristics, and column (3) further adds mayor characteristics. Columns

³¹The northern region of Brazil (i.e. the Amazon region consisting of Amapa, Amazonas, Roraima, Rondonia, Acre and Tocantins), was considered a single state for lottery purposes due to its low population density. We use a unique indicator for this region in the state fixed effect specifications.

³²It is important to note that this is not a random sample of mayors elected in 2000. Some mayors elected in 2000 would serve their second term in office which makes them ineligible for immediate reelection due to the existence of a two term limit. See Ferraz and Finan (2005) for a description of term limits in Brazil and its potential effects on corruption.

(4)-(6) simply replicate the specifications presented in columns (1)-(3) for the alternative sample.³³

The results of Table 3 suggest that the audits and the associated release of information did not have a significant effect on the reelection probability of incumbent mayors. While reelection rates are 3 percentage points lower in municipalities that were audited (column 1), we cannot reject that this effect is statistically different from zero. The inclusion of municipal and mayor characteristics (columns (2) and (3)), which should absorb some of the variation in the error term, does not alter the estimated effect or the estimated precision. Restricting the sample to include only mayors that chose to run for reelection provides similar results (columns (4)-(6)).

Even though the audits do not appear to significantly affect reelection probabilities, winning the election is a discontinuous outcome. The program might have affected other measures of electoral performance such as vote shares and electoral competition, without affecting electoral outcomes. Panel A of table 4 displays the results of estimating equation 1 using alternative electoral outcomes: vote share and win margin. The first three columns present the effect of the audit policy on vote shares for the sample mayors that run for reelection, and columns (4)-(6) display the estimated effect on these mayors' win margin. For each dependent variable, we estimate the same three specifications presented in the previous table. As in the case of reelection rates, we find no significant difference for municipalities that were audited compared to non-audited municipalities for both vote shares and win margin.³⁴

The models estimated in Panel B of table 4 exploit the fact that for incumbent mayors we know their electoral outcomes in the previous election. With this additional information, we can compare changes in electoral outcome across municipalities that were audited to municipalities that were not. We estimate the following regression:

$$\Delta y_{ms} = y_{mst} - y_{mst-1} = \alpha + \beta A_{ms} + X_{ms} \gamma + \varepsilon_{ms}, \quad (2)$$

where β is the effect of the audit on the change in electoral outcome y_{ms} . Table 4, panel B, displays the estimation results. Again, we find no differential change in vote share and margins of victory from the 2000 to the 2004 election among mayors that were audited compared to those that were

³³Also note that the sample has been restricted to the non-missing observations of the various control variables, so as to keep its size constant across specifications.

³⁴This finding is robust to the use of alternative measures of political competition such as the effective number of candidates, and different sample specifications.

not. These results go along with the evidence from Table 3 showing that the audits and its release of information on corruption levels had no effect on subsequent electoral outcomes.

Although we do not find any evidence that this anti-corruption policy had an average effect on electoral outcomes, in some respects this is not unexpected. The simple comparison between audited and non-audited municipalities ignores two important aspects of the program. First, the program was designed for media to be the main provider of this information. Since summaries of the audit reports are posted on the internet and distributed to media sources, the release of information on corruption might not have reached voters in municipalities where media sources were not available. Second, we would expect differential effects between positive and negative reports, which may cancel each other out on average. To account for these program characteristics, we use a slightly different research design which exploits the timing of the release of the audit reports. This new approach allows us to test for a differential effect of the program that captures both the role of media and the type of information revealed.

4.3 Testing for Differential Effects by Corruption Levels and Media Availability

This section investigates whether the program's effect varies according to the extent of corruption found as well as the existence of media in the municipality. To do so, we first use the audit reports to construct an objective measure of corruption for each municipality that was audited. We then exploit the timing of the release of audit reports to construct a control group for whose level of corruption we can measure.

Figure 2 depicts the timing of the release of the corruption reports. As the figure shows, prior to the October elections, the Federal government had audited and released information on the corruption level of 376 municipalities randomly selected across 8 lotteries. After the municipal elections, audit reports for 180 municipalities were released, providing us information on corruption levels for two groups of municipalities: those where corruption levels were released prior to the election - potentially affecting voters' perceptions on mayor's performance - and those municipalities where the audit results were released only after the election. Since municipalities were selected at random, the set of municipalities where audit reports were only made available after the election represent a proper control group. Comparing municipalities that were audited prior to the election to municipalities that were audited after the election, we are able to test for both an asymmetric

effect between positive and negative corruption reports and the effect of media.

Specifically, we estimate the following regression for the sample of municipalities that have been audited:

$$\begin{aligned}
 y_{ms} = & \alpha + \beta_0 C_{ms} + \beta_1 P_{ms} + \beta_2 (P_{ms} \times C_{ms}) + \beta_3 (P_{ms} \times M_{ms}) \\
 & + \delta_0 M_{ms} + \delta_1 (M_{ms} \times C_{ms}) + \delta_2 (M_{ms} \times C_{ms} \times P_{ms}) + X_{ms} \gamma + \nu_m + \varepsilon_{ms}, \quad (3)
 \end{aligned}$$

where y_{ms} indicates whether an eligible incumbent mayor in municipality m in state s was reelected in 2004, C_{ms} is the number of corrupt irregularities found in the municipality, and P_{ms} indicates whether or not the release of audit report was before the municipal elections. Our measure of media, M_{ms} , in this specification is the number of AM radio stations that exist in the municipality. In the majority of municipalities in Brazil, radio is often the most important source of information on both local politics and federal news. We also experiment with alternative measures of media such as the number of newspaper sin the municipality, however in Brazil newspaper circulation is very low, especially among poorest households. With this model, the parameter of interest δ_2 captures the differential effect of audits by both the level of corruption reported, and the number of radio stations in the municipality.

Table 5 presents the estimation results for a series of models based on equation 3. Panel A reports the results for continuous measures of radio and corruption while panel B presents a specification in which both media and corruption are converted into indicator variables to explore the asymmetry between positive and negative audit reports. Our findings show that the audit campaign had a significant negative impact on reelection rates in the municipalities that have higher levels of corruption and more media. For example in column (1) of panel A, the OLS estimate of the double interaction is -13.5 percentage points (standard error=0.045 points), which represents a 32 percent reduction in the probability of being reelected. The inclusion of controls for both municipal and mayor characteristics has no effect on the estimate of the differential audit impact (columns (2) and (3)).

When we estimate the differential effects of the audit using binary variables for corruption and radio (panel B), we find similar yet more pronounced effects. This specification exploits the potential differences between municipalities without any reported corruption to those municipalities

with some corruption, and similarly for the case of having at least one radio station.³⁵ These estimates reveal an important distinction between audit reports that revealed corruption and those where no corruption was found. In municipalities with at least one radio station, a positive audit report has the effect of increasing the reelection rates by 50.8 percentage point (with a p-value of .141 that $\beta_1 + \beta_3 = 0$ of equation 3). Conversely, the revelation of a negative report has the effect of reducing the probability of reelection by 22.3 percentage point (with a p-value of .154 that $\beta_1 + \beta_2 + \beta_3 + \delta_2 = 0$ of equation 3).

To recapitulate, our findings highlight the role that media plays in making the information of audit reports available to voters and enabling political accountability. Moreover, it serves to promote non-corrupt mayors by increasing their probability of reelection.

4.4 Interpretation of the Results

In the previous section, we provided evidence that the anti-corruption policy reduced the probability of reelection among mayors in municipalities where corruption was detected and a radio station exists to help disseminate the audit reports. Here we complement the regression results with a graphical analysis to better demonstrate the differential impact of the program.

Panel A of Figure 3 reproduces Figure 1 in section 3, along with a plot depicting the fitted value of the association between the probability of reelection and corruption for municipalities that were audited only after the election. As this figure illustrates, the negative association between reelection and corruption is present not only for municipalities where the audit information was released prior to the election but also for the municipalities where the information was revealed only after the election. This suggests that voters are, to some extent, aware of the mayor's corruption and punish them accordingly in the elections.

A comparison of the two fitted lines, however, suggest that the audit program did change voter's prior beliefs about the mayor corruption. Among municipalities that were audited prior to the election, the association between reelection and corruption is much more negative than in municipalities where voters were not informed about the audits. Moreover this difference in slopes increase with the level of corruption reported.

³⁵While ideally we would prefer to estimate a model with dummies for every level of corruption and radio, small cell sizes and limited statistical power is a major concern with a sample of only 274 observations.

Panel B of Figure 3 decomposes this figure further to demonstrate how the availability of media influences the effect of the program. Here, we distinguished among the municipalities that were audited prior to the election, between those with and without a local radio station. This figure accentuates the fundamental role that media plays in disseminating the information to the public. The municipalities where information on corruption was released prior to the election but do not have any radio stations appear similar to the municipalities where information became available only after the elections. Whereas among the municipalities that were audited prior to the elections and media is available, increases in corruption significantly decreases the probability of reelection. We also observe that a positive electoral response when no corruption is reported. We interpret these findings as suggesting that while voters have initial priors that the average politician is corrupt, new information that reveals zero corruption increases reelection probabilities, while information that reveals larger than expected corruption levels decreases reelection probability.

4.5 Robustness Checks

4.5.1 Accounting for Compositional Confounds

We have argued that the presence of media sources enable voters to further punish corrupt politicians once the anti-corruption program reveals the true extent of their corruption. Unfortunately however our experiment, while randomized over which municipalities were audited, was not randomized on the availability of media. As such our measure of media could be serving as a proxy for other characteristics of the municipality that induce a differential effect of the audit reports on reelection outcomes. For example, if more available media is positively correlated with the literacy rate of the municipality, then our results may be capturing a differential effect by education levels rather than media per se. It would then cast doubt on our claim that the effect of this anti-corruption program is through the presence of media.

To test for these potential confounds, we include in the estimation of equation 3 a series of double interaction terms on a host of other characteristics that might correlated with the number of radio stations in the municipality.³⁶ Table 6 presents the results of these estimations. For easy of comparison, column (1) reproduces the base specification of Table 5. Columns (2)-(10)

³⁶For each double interaction, we also include variable itself, the variable interacted with being audited prior to the elections, and the variable interacted with corruption.

present a series of specifications that sequentially include different double interactions of municipal characteristics.³⁷ Our most general model includes, in addition to all the double interaction characteristics, a set of municipal controls (column (10)). Across each specification, our estimate of the double interaction between radio, corruption, and preelection audit remains remarkably stable and statistically significant. This result holds with the inclusion of such measures as literacy rates, electoral competition, income and inequalities, as well as various other potential correlates of media availability. In effect, this table provide suggest evidence that media is in fact the channel through which this anti-corruption program is increasing political accountability.

5 Conclusions

It is widely believed that improved voters' information enhances the accountability of politicians. In this paper, we exploit an unique natural experiment provided by Brazil's anti-corruption program to examine this claim. In April of 2003, the Brazilian government began an ambitious anti-corruption program designed to audit a municipality's expenditure of federally transferred funds. To promote fairness and transparency, the program incorporated two key design features: first, a random lottery determines which municipalities are audited; and second, the reports of the irregularities found are released to the mass media and sent to the federal tribunal for potential prosecution. The randomization of the audits and public dissemination of the reports allow us test whether the release of information about government corruption affects the incumbent mayor's probability of being reelected. Furthermore, because the media is the principal actor in the dissemination these reports, we investigate the role that radio plays in transmitting this information to the voters.

The paper has two main findings. First, we show that voters, once empowered with information, will hold corrupt politicians accountable. In municipalities with more radio stations and higher levels of corruption, the information released by the audit program reduced reelection rates by 32 percent. In areas without radio stations, the audit program had no effect on the reelection rates of incumbent mayors. These results demonstrate the importance of media, and in particular radio, in disclosing the information about corruption to voters. In this regard our paper contributes to a growing literature that emphasizes the role of media in inducing government to be more accountable and responsive to voters.

³⁷The results are similar when doing the same exercise for an indicator of radio.

Our second main finding is that voters, even prior to the release of the information, knew to some extent the level of corruption in a municipality. Using the audit reports that were only released after the elections, we show that corrupt mayors are less likely to be reelected even in those municipalities where voters did not learn about the audit reports until after the election. Given that voters knew to some extent the level of corruption, the release of information served primarily to reward honest politicians and punish more severely corrupt politicians. This finding contradicts the general perception that on average voters are either ignorant about corruption or exchange political corruption for material benefits or a particular ideological stance (Rundquist, Strom, and Peters 1977). It also suggests that, when it comes to information on corruption, voters do seem to learn and are not necessarily entrenched in their prior beliefs.

Finally, we would like to point out that while the program had no effects on reelection rates in municipalities without media, it might have been effective along other dimensions. It might have reduced overall corruption - its primary objective - or even achieved judicial accountability, since severe cases of corruption are sent to federal prosecutors. Whether or not the program has an effect along these other dimensions is an area of future research.

References

- Ades, Alberto, and Rafael Di Tella. 1999. "Rents, Competition, and Corruption." *American Economic Review* 94 (4): 982–93.
- Ahrend, Rudiger. 2002. "Press Freedom, Human Capital, and Corruption." *Mimeo*.
- Banks, Jeffrey, and R. Sundaram. 1993. "Adverse Selection and Moral Hazard in a Repeated Elections Model." p. Working Paper.
- Bardhan, Pranab. 1997. "Corruption and Development: A Review of Issues." *Journal of Economic Literature*, vol. 35.
- Barro, Robert. 1970. "The Control of Politicians: An Economic Model." *Public Choice* 14:19–42.
- Besley, Tim. 2004. "The New Political Economy." *Keynes lecture delivered at the British Academy on October 13th 2004*.
- Besley, Tim, and Robin Burgess. 2002. "The Political Economy of government responsiveness: Theory and evidence from India." *Quarterly Journal of Economics*, November.
- Besley, Tim, Robin Burgess, and Andrea Pratt. 2002. "Mass Media and Political Accountability." Edited by Roumeen Islam, *The Right to Know: Institutions and the Media*. Washington, D.C.: World Bank.
- Besley, Tim, and Michael Smart. 2003. "Fiscal Restraint and Voter Welfare." *Manuscript*.
- Brunetti, Aymo, and Beatrice Weder. 2003. "A free press is bad news for corruption." *Journal of Public Economics* 87:1801– 1824.
- DellaVigna, Stefano, and Ethan Kaplan. 2005. "The Fox News Effect: Media Bias and Voting." *Mimeo*, March.
- Di Tella, Rafael, and Ernesto Schargrotsky. 2003. "The Role of Wages and Auditing During a Crackdown on Corruption in the City of Buenos Aires." *Journal of Law and Economics*, vol. 46.
- Ferejohn, John. 1986. "Incumbent Performance and Electoral Control." *Public Choice* 50:5–25.
- Ferraz, Claudio, and Frederico Finan. 2005. "Reelection Incentives and Political Corruption: Evidence from Brazilian Audit Reports." *UC Berkeley, Mimeo*.

- Fleischer, David. 2002. "Corruption in Brazil: Defining, Measuring, and Reducing." *A Report of the CSIS Americas Program*, July.
- Geddes, Barbara, and Artur Ribeiro Neto. 1999. *Institutional Sources of Corruption in Brazil*. Edited by Keith S. Rosenn and Richard Downes. University of Miami: North South Center Press.
- Graf Lambsdorff, Johann. 2003. "How Corruption Affects Productivity." *Kyklos*, vol. 56.
- Kunda, Z. 1987. "Motivated Inference: Self-serving generation and evaluation of causal theories." *Journal of Personality and Social Psychology*, vol. 53.
- Lord, Charles G., Lee Ross, and Mark R. Lepper. 1979. "Biased Assimilation and Attitude Polarization: The Effects of Prior Theories on Subsequently Considered Evidence." *Journal of Personality and Social Psychology* 37 (11): 2098–2109 (November).
- Mauro, Paulo. 1995. "Corruption and Growth." *The Quarterly Journal of Economics* 110 (3): 681–712.
- Munro, Geoffrey D., and Peter H. Ditto. 1997. "Biased assimilation, attitude polarization, and affect in reactions to stereotype-relevant scientific information." *Personality and Social Psychology Bulletin* 23 (6): 636–653.
- Olken, Ben. 2004. "Monitoring corruption: evidence from a field experiment in Indonesia." *Harvard University, Mimeo*.
- Peffley, Mark, Stanley Feldman, and Lee Sigelman. 1987. "Economic Conditions and Party Competence: Processes of Belief Revision." *The Journal of Politics* 49 (1): 100–121 (July).
- Persson, Torsten, Gerard Roland, and Guido Tabellini. 1997. "Separation of Powers and Political Accountability." *The Quarterly Journal of Economics* 112 (4): 1163–1202 (November).
- Persson, Torsten, and Guido Tabellini. 2000. *Political Economics: Explaining Economic Policy*. Cambridge, Massachusetts: MIT Press.
- Peters, John G., and Susan Welch. 1980. "The effects of charges of corruption on voting behavior in congressional elections." *American Political Science Review*, vol. 74.
- Plous, Scott. 1991. "Biases in the Assimilation of Technological Breakdowns: Do Accidents Make us Safer?" *Journal of Applied Social Psychology* 21 (13): 1058–1082 (July).

- Rabin, Mathew. 1998. "Psychology and Economics." *Journal of Economic Literature* 36 (1): 11–46 (March).
- Rabin, Mathew, and Joel L. Schrag. 1999. "First Impressions Matter: A Model of Confirmatory Bias." *The Quarterly Journal of Economics* 114 (1): 37–82 (Feb).
- Rahn, Wendy M. 1993. "The Role of Partisan Stereotypes in Information Processing about Political Candidates." *American Journal of Political Science* 37 (2): 472–496 (May).
- Reinikka, Ritva, and Jakob Svensson. 2004. "The power of information: evidence from a newspaper campaign to reduce capture of public funds." *World Bank, Mimeo*.
- Rose-Ackerman, Susan. 2004. "The Challenge of Poor Governance and Corruption." *Copenhagen Consensus and Yale University, Mimeo*.
- Rundquist, Barry S., Gerald S. Strom, and John G. Peters. 1977. "Corrupt Politicians and Their Electoral Support: Some Experimental Observations." *American Political Science Review*, vol. 71.
- Scott, James C. 1969. "Corruption, Machine Politics and Political Change." *American Political Science Review* 63 (4): 1142–1158 (December).
- Sen, Amartya. 1999. *Development as Freedom*. New York: Anchor books.
- Sigelman, Lee, and Carol K. Sigelman. 1984. "Judgements of the Carter-Reagan Debate: The Eyes of the Beholders." *The Public Opinion Quarterly* 48 (3): 624–628 (Autumn).
- Stromberg, David. 2004. "Radio's Impact on Public Spending." *Quarterly Journal of Economics*.
- Welch, Susan, and John R. Hibbing. 1997. "The effects of charges of corruption on voting behavior in congressional elections, 1982-1990." *The Journal of Politics* 59 (1): 226–239 (February).

Table 1: Summary Statistics

	Obs	Mean	Standard Deviation
<i>Political Variables</i>			
Reelection rates for mayors in 2000 municipal elections	5464	0.404	0.491
Reelection rates for mayors in 2004 municipal elections	3255	0.408	0.491
Reelection rates for mayors seeking reelection in 2004 elections	2333	0.569	0.495
Change in margin of victory	2255	-0.113	0.220
Change in the incumbent's vote share	2327	-0.061	0.165
Effective number of political parties in 2000 elections	5464	2.159	0.533
Effective number of political parties in 2004 elections	5458	2.223	0.534
Margin of victory for 2000 municipal elections	5326	0.162	0.149
Margin of victory for 2004 municipal elections	5358	0.142	0.140
<i>Corruption Variables</i>			
Proportion of municipalities with irregularities associated with corruption	548	0.765	0.424
Number of corrupt violations	418	2.376	1.513
Number of irregularities associated with illegal procurement practices	418	1.241	1.091
Number of irregularities associated with funds diversion	418	1.029	1.027
Number of irregularities associated with over-invoicing	418	0.080	0.285
Number of non-corrupt irregularities	545	2.919	1.594
<i>Media Variables</i>			
Proportion of municipalities with an AM radio station	4872	0.221	0.415
Number of AM radio stations among municipalities with a AM radio station	1110	1.486	1.367
Proportion of municipalities with a daily newspaper among those municipalities with a newspaper	5181	0.767	0.423
Number of daily newspapers	4008	3.685	12.805
<i>Demographic Variables</i>			
Population in 2000	5464	21925	40109
Share of population - urban	5464	0.586	0.232
Share of population - literate	5464	0.800	0.116
Per capita income	5464	R\$ 204.67	R\$ 111.48
Income inequality - Gini coefficient	5464	0.532	0.066

Table 2: Do voters punish corrupt politicians?

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A.								
	Dependent variable: <i>Pr(reelection)</i>							
	All incumbent mayors				Only mayors that run for reelection			
Number of corrupt violations	-0.04 [0.020]*	-0.051 [0.020]*	-0.044 [0.021]*	-0.055 [0.021]*	-0.055 [0.024]*	-0.061 [0.025]*	-0.051 [0.026]+	-0.049 [0.026]+
Observations	277	277	277	277	196	196	196	196
R-squared	0.06	0.07	0.12	0.25	0.09	0.1	0.16	0.29
Panel B.								
	Dependent variable: <i>Pr(reelection)</i>							
	All incumbent mayors				Only mayors that run for reelection			
Any corrupt violatoin (1/0)	-0.18 [0.076]*	-0.203 [0.076]**	-0.185 [0.076]*	-0.21 [0.076]**	-0.165 [0.083]*	-0.175 [0.084]*	-0.155 [0.087]+	-0.171 [0.086]*
Observations	277	277	277	277	196	196	196	196
R-squared	0.07	0.08	0.13	0.25	0.09	0.09	0.15	0.29
Number of non-corruption violations	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Municipal characteristics	No	No	Yes	Yes	No	No	Yes	Yes
Mayor characteristics	No	No	No	Yes	No	No	No	Yes

Notes: Robust standard errors in brackets. Significantly different than zero at 99 (**), 95 (*), 90 (+) percent confidence. Municipal characteristics include: population density (persons/km), percentage of the population that is literate, percentage of the population that lives in the urban sector, per capita income expressed in logarithms, Gini coefficient for income, effective number of political parties in the 2000 mayor elections, zoning laws (1/0), economic incentives for business (1/0), paved roads (1/0), proportion of the budget spent on public employment, municipal police (1/0), small claims court (1/0), judiciary district (1/0), number of daily newspapers, number of AM radio stations. Mayor characteristics include: gender (1/0 for male), age, married (1/0), education level. party dummies.

Table 3: The Effects of Audits on Reelection Probabilities

	(1)	(2)	(3)	(4)	(5)	(6)
	Dependent variable: <i>Pr(reelection)</i>					
	All incumbent mayors			Only incumbent mayors that run for reelection in 2004		
Preelection Audit (1/0)	-0.03 [0.037]	-0.027 [0.037]	-0.026 [0.035]	-0.02 [0.045]	-0.016 [0.045]	-0.021 [0.044]
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipal characteristics	No	Yes	Yes	No	Yes	Yes
Mayor characteristics	No	No	Yes	No	No	Yes
Observations	2883	2883	2883	2048	2048	2048
R-squared	0.02	0.04	0.09	0.02	0.04	0.08

Notes: Robust standard errors in brackets. Significantly different than zero at 99 (**), 95 (*), 90 (+) percent confidence. Municipal characteristics include: population density (persons/km), percentage of the population that is literate, percentage of the population that lives in the urban sector, per capita income expressed in logarithms, Gini coefficient for income, effective number of political parties in the 2000 mayor elections, zoning laws (1/0), economic incentives for business (1/0), paved roads (1/0), proportion of the budget spent on public employment, municipal police (1/0), small claims court (1/0), judiciary district (1/0), number of daily newspapers, number of AM radio stations. Mayor characteristics include: gender (1/0 for male), age, married (1/0), education level. party dummies.

Table 4: The Effect of Audits on Vote Shares and Win Margins

	(1)	(2)	(3)	(4)	(5)	(6)
<u>Panel A.</u>	Dependent Variable: Vote share			Dependent Variable: Win margin		
Audited (Y=1)	-0.007 [0.010]	-0.006 [0.009]	-0.006 [0.009]	-0.004 [0.013]	-0.004 [0.013]	-0.005 [0.013]
Observations	2031	2031	2031	2013	2013	2013
R-squared	0.02	0.07	0.09	0.02	0.03	0.04
<u>Panel B.</u>	Dependent Variable: Change in vote share			Dependent Variable: Change in win margin		
Audited (Y=1)	-0.013 [0.015]	-0.013 [0.015]	-0.012 [0.014]	-0.008 [0.021]	-0.01 [0.021]	-0.008 [0.021]
Observations	2042	2042	2042	1983	1983	1983
R-squared	0.03	0.16	0.19	0.03	0.05	0.09
State fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Municipal characteristics	No	Yes	Yes	No	Yes	Yes
Mayor characteristics	No	No	Yes	No	No	Yes

Notes: Robust standard errors in brackets. Significantly different than zero at 99 (**), 95 (*), 90 (+) percent confidence. Municipal characteristics include: population density (persons/km), percentage of the population that is literature, percentage of the population that lives in the urban sector, per capita income expressed in logarithms, Gini coefficient for income, effective number of political parties in the 2000 mayor elections, zoning laws (1/0), economic incentives for business (1/0), paved roads (1/0), proportion of the budget spent on public employment, municipal police (1/0), small claims court (1/0), judiciary district (1/0), number of daily newspapers, number of AM radio stations. Mayor characteristics include: gender (1/0 for male), age, married (1/0), education level. party dummies.

Table 5: The Effects of Audits by Corruption Levels and Availability of Media

	(1)	(2)	(3)
Panel A.	Dependent variable: <i>Pr(Reelection)</i>		
Number of corrupt violations	-0.053 [0.035]	-0.053 [0.038]	-0.073 [0.045]
Preelection audit	-0.09 [0.116]	-0.125 [0.122]	-0.136 [0.126]
Preelection audit X Number of corrupt violations	0.024 [0.043]	0.03 [0.045]	0.056 [0.051]
Number of radio stations	-0.232 [0.111]**	-0.232 [0.120]+	-0.245 [0.136]*
Number of radio stations X Number of corrupt violations	0.085 [0.031]***	0.086 [0.032]**	0.084 [0.062]
Preelection audit X Number of radio stations	0.273 [0.137]**	0.287 [0.143]*	0.341 [0.150]**
Preelection audit X Number of radio stations X Number of corrupt violations	-0.135 [0.045]***	-0.13 [0.046]**	-0.135 [0.069]*
Observations	278	277	277
R-squared	0.08	0.13	0.29
Panel B.	Dependent variable: <i>Pr(Reelection)</i>		
Any corrupt violation (1/0)	-0.224 [0.162]	-0.218 [0.170]	-0.249 [0.180]
Preelection audit	-0.131 [0.165]	-0.186 [0.174]	-0.201 [0.176]
Preelection audit X Any corrupt violations	0.138 [0.189]	0.003 [0.180]	0.214 [0.199]
Any radio station (1/0)	-0.377 [0.279]	-0.443 [0.309]	-0.456 [0.308]
Any radio stations X Any corrupt violations	0.408 [0.305]	0.389 [0.326]	0.403 [0.325]
Preelection audit X Any radio stations	0.639 [0.324]**	0.696 [0.331]*	0.826 [0.328]**
Preelection audit X Any radio stations X Any corrupt violations	-0.869 [0.363]**	-0.878 [0.381]*	-0.919 [0.369]**
Observations	278	277	277
R-squared	0.08	0.29	0.29
Municipal Characteristics	N	Y	Y
Mayor Characteristics	N	N	Y
State Intercepts	Y	Y	Y

Notes: Robust standard errors in brackets. Significantly different than zero at 99 (**), 95 (*), 90 (+) percent confidence. Municipal characteristics include: population density (persons/km), percentage of the population that is literate, percentage of the population that lives in the urban sector, per capita income expressed in logarithms, Gini coefficient for income, effective number of political parties in the 2000 mayor elections, zoning laws (1/0), economic incentives for business (1/0), paved roads (1/0), proportion of the budget spent on public employment, municipal police (1/0), small claims court (1/0), judiciary district (1/0), number of daily newspapers, number of AM radio stations. Mayor characteristics include: gender (1/0 for male), age, married (1/0), education level, party dummies.

Table 6: Testing for Compositional Confounds

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Dependent Variable: <i>Pr(Reelection)</i>									
Number of corrupt violations	-0.053	-0.017	-0.011	-0.105	-0.021	0.058	0.085	-0.085	-0.207	-0.193
	[0.035]	[0.113]	[0.113]	[0.321]	[0.330]	[0.331]	[0.329]	[0.368]	[0.381]	[0.391]
Number of radio stations	-0.232	-0.204	-0.218	-0.189	-0.183	-0.205	-0.229	-0.152	-0.119	-0.125
	[0.111]**	[0.120]+	[0.115]+	[0.121]	[0.127]	[0.129]	[0.136]+	[0.144]	[0.140]	[0.149]
Number of radio stations X Number of corrupt violations	0.086	0.09	0.084	0.081	0.087	0.09	0.067	0.05	0.052	0.053
	[0.033]*	[0.032]**	[0.033]*	[0.035]*	[0.035]*	[0.036]*	[0.039]+	[0.039]	[0.040]	[0.042]
Preelection audit	-0.09	-0.04	-0.068	-0.227	-1.537	-1.489	-0.194	-0.603	-0.848	-0.898
	[0.116]	[0.313]	[0.318]	[1.068]	[1.236]	[1.253]	[1.530]	[1.621]	[1.676]	[1.664]
Preelection audit X Number of corrupt violations	0.024	-0.167	-0.165	-0.079	0.124	0.084	-0.218	-0.048	-0.094	-0.082
	[0.043]	[0.133]	[0.133]	[0.369]	[0.425]	[0.431]	[0.484]	[0.508]	[0.519]	[0.524]
Preelection audit X Number of radio stations	0.273	0.271	0.273	0.252	0.235	0.271	0.323	0.254	0.258	0.244
	[0.137]**	[0.149]+	[0.146]+	[0.152]+	[0.156]	[0.162]+	[0.168]+	[0.176]	[0.174]	[0.180]
Preelection audit X Number of radio stations X Number of corrupt violations	-0.135	-0.173	-0.171	-0.165	-0.161	-0.182	-0.191	-0.167	-0.178	-0.167
	[0.045]***	[0.051]**	[0.051]**	[0.052]**	[0.055]**	[0.061]**	[0.061]**	[0.064]**	[0.068]**	[0.068]**
Double interactions terms:										
Urban	N	Y	Y	Y	Y	Y	Y	Y	Y	Y
Population density (Population/Area)	N	N	Y	Y	Y	Y	Y	Y	Y	Y
Literacy rate	N	N	N	Y	Y	Y	Y	Y	Y	Y
Per capita income	N	N	N	N	Y	Y	Y	Y	Y	Y
Number of newspapers	N	N	N	N	N	Y	Y	Y	Y	Y
Income inequality	N	N	N	N	N	N	Y	Y	Y	Y
Judiciary district	N	N	N	N	N	N	N	Y	Y	Y
Electoral Competition	N	N	N	N	N	N	N	N	Y	Y
Municipal Characteristics	N	N	N	N	N	N	N	N	N	Y
State Intercepts	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Observations	278	277	277	277	277	277	277	277	277	277
R-squared	0.08	0.11	0.11	0.12	0.14	0.15	0.16	0.17	0.19	0.2

Notes: Robust standard errors in brackets. Significantly different than zero at 99 (**), 95 (*), 90 (+) percent confidence. Municipal characteristics include: population density (persons/km), percentage of the population that is literature, percentage of the population that lives in the urban sector, per capita income expressed in logarithms, Gini coefficient for income, effective number of political parties in the 2000 mayor elections, zoning laws (1/0), economic incentives for business (1/0), paved roads (1/0), proportion of the budget spent on public employment, municipal police (1/0), small claims court (1/0), judiciary district (1/0), number of daily newspapers, number of AM radio stations. Mayor characteristics include: gender (1/0 for male), age, married (1/0), education level. party dummies.

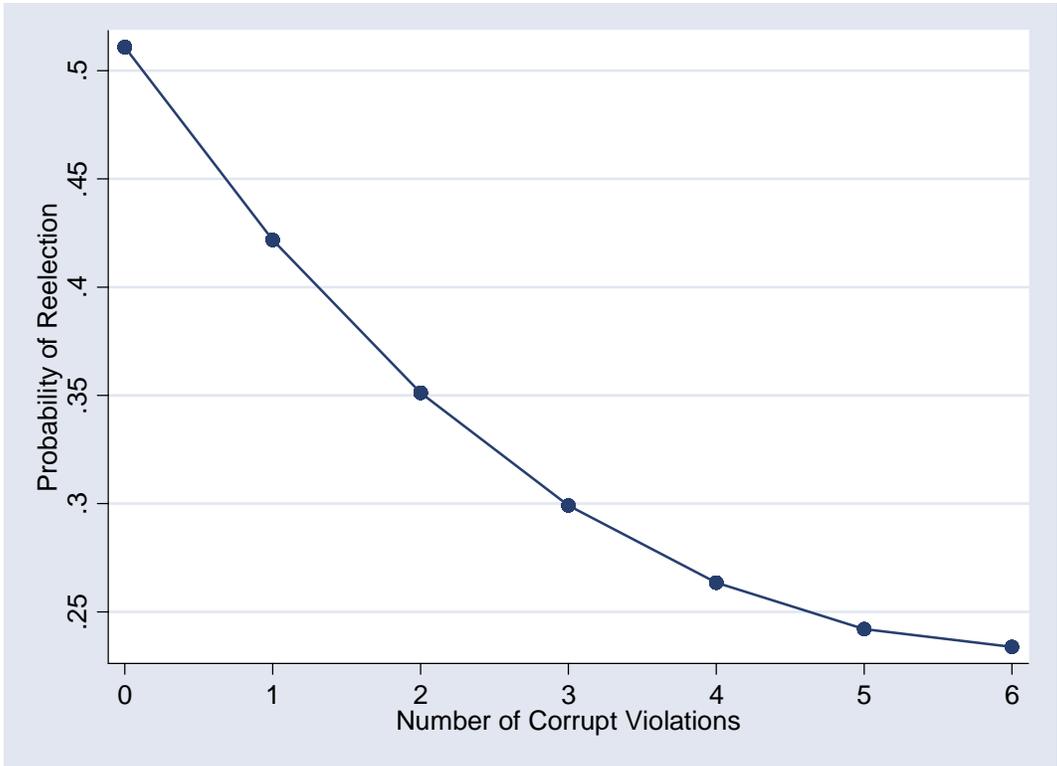


Figure 1: Predicted Probability of Reelection by Corruption Level Reported in the Audit (second-order polynomial fit)

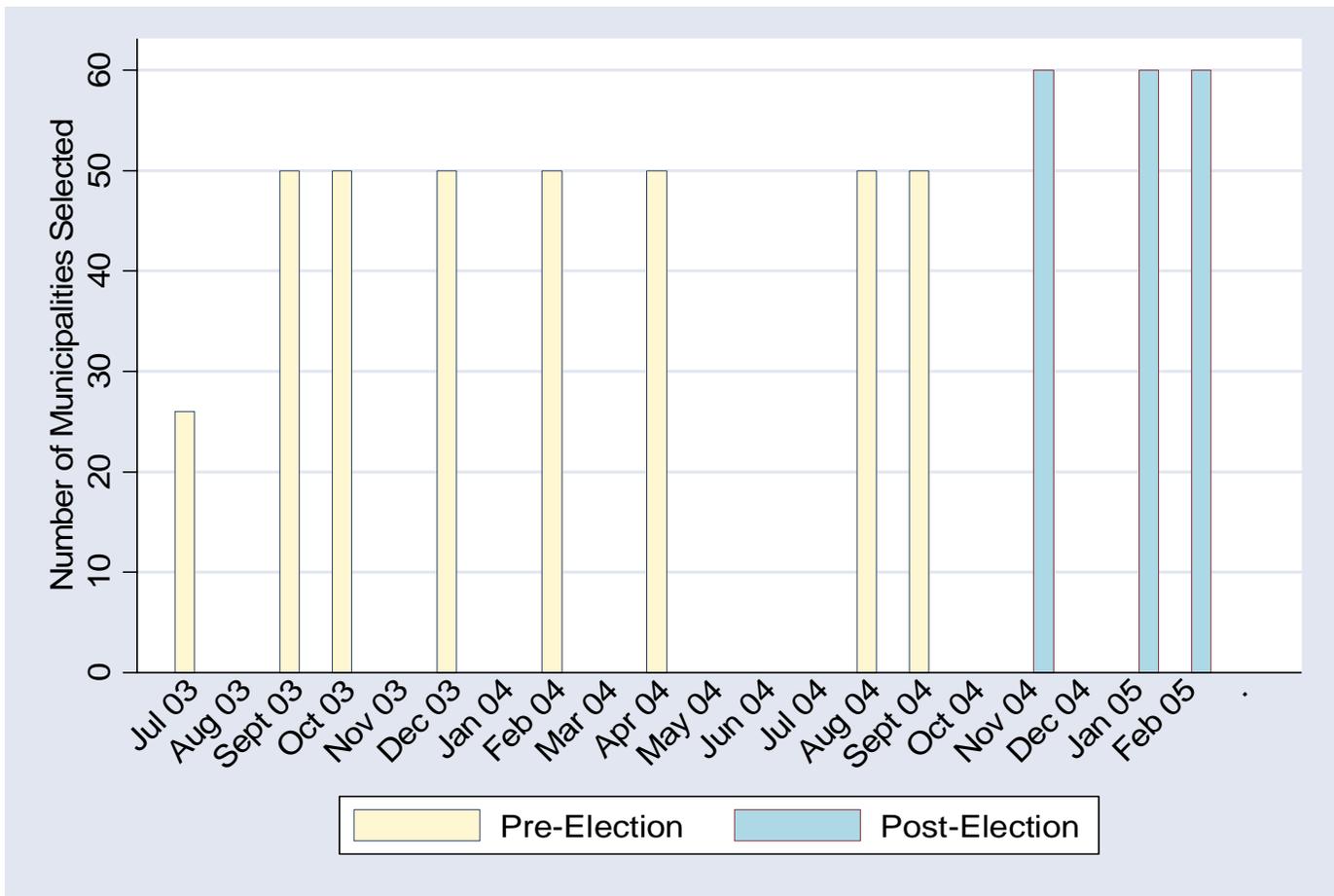
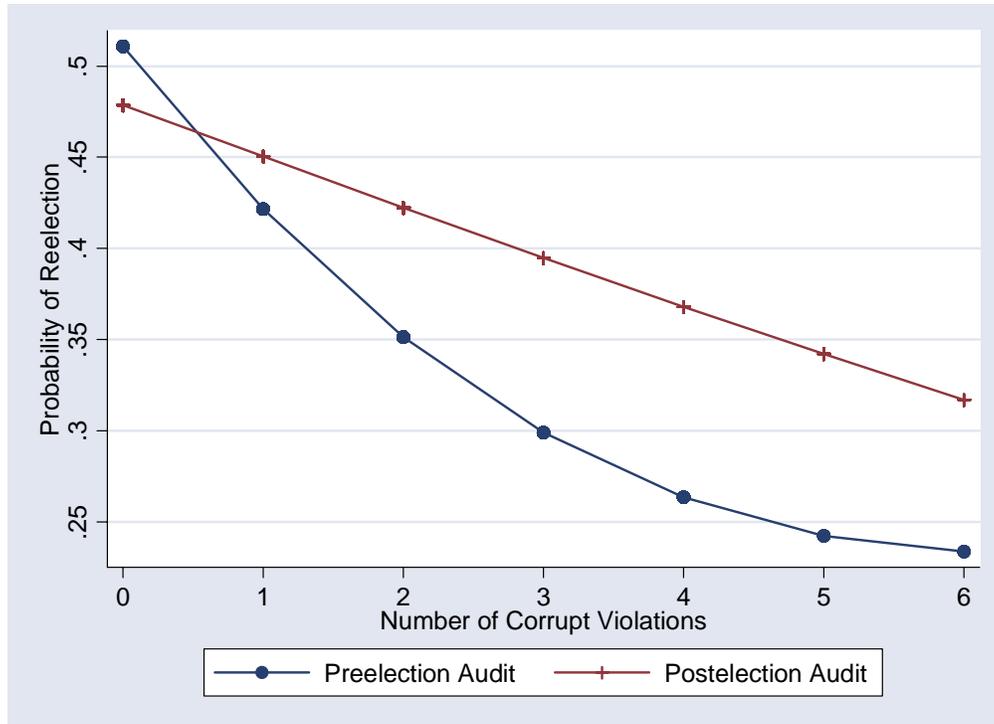
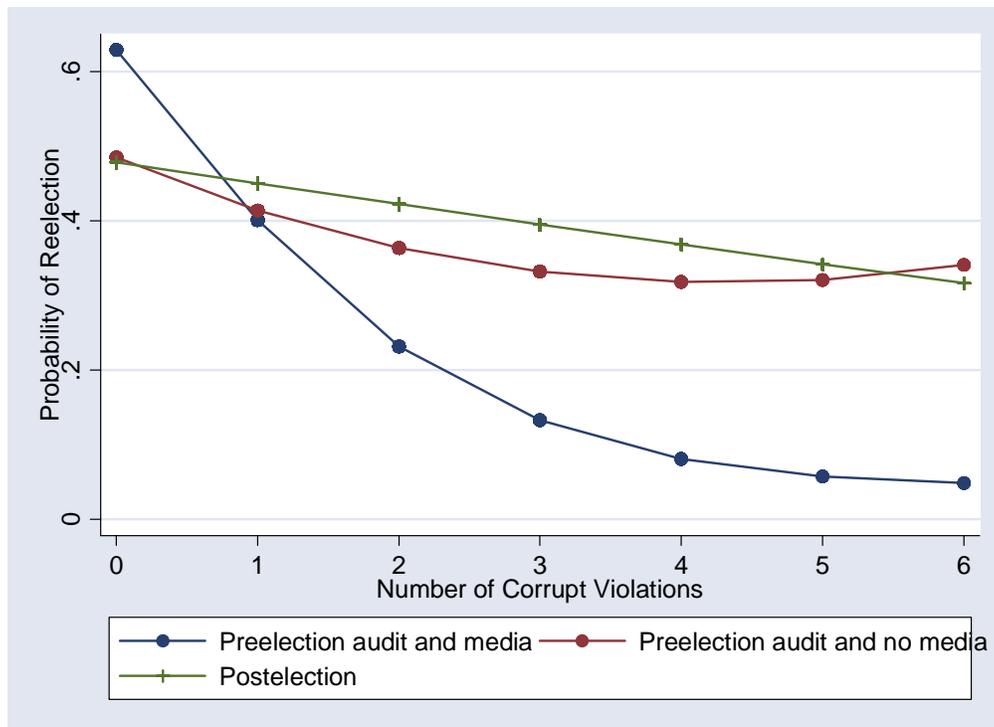


Figure 2: Dates of the Release of the Audit Reports



Panel A: Comparing municipalities audited preselection to municipalities audited postselection



Panel B: Comparing media versus non-media in municipalities audited preselection

Figure 3: Predict Probability of Reelection by Corruption Level