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Fighting Political Corruption: Evidence from Brazil

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Introduction

Corruption is considered by many a major impediment to economic development, and yet it remains pervasive throughout the world. Developing countries, in particular, provide seemingly endless examples of politicians diverting funds intended for basic public services and

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obtaining bribes to favor particular firms.[1] While there has been growing research on corruption in the past decade, most work has focused on diagnosing corruption and explaining its causes. Glaeser and Goldin (2006) argue that reduction in corruption over time in the U.S. was due to a combination of increasing political competition, an active media uncovering corruption scandals, and an independent judiciary that successfully prosecuted corrupt officials. What policies are effective to fight corruption in developing countries remain poorly understood.[2]

This chapter examines the effects of anti-corruption policies with a focus on political corruption—corrupt practices by political leaders. We focus on anti-corruption policies that have been adopted in Brazil since early 2000s. We use the case of Brazil for two important reasons. First, the Federal Comptrollers Office (CGU) adopted a randomized audits policy in 2003 that allow us to use audit reports to objectively measure corruption. Thus, we are able to overcome one of the biggest barriers to study corruption which is the difficulty in measuring it. Second, this policy and its variations allows us to answer some important questions regarding anti-corruption policies by overcoming empirical identification challenges.

We start by describing the "web" of institutions that foster horizontal accountability in the Brazilian context and how the Comptrollers Office (CGU), responsible for the Randomized Audit Policy, interact with other institutions responsible for monitoring government activities, investigating suspected corruption, and punishing corrupt practices.[3] We then describe the institutional details of the Randomized Audit Program that started in Brazil in 2003 and has audited more than 2000 municipalities. Following this institutional background, we describe how numerous

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number of studies have used audit reports to build measures of corruption. We then use the existing literature based on these audits reports to answer three questions: (1) whether information from audit reports affect electoral outcomes, (2) whether the threat of being exposed affects politicians' behavior, and (3) whether audits are effective to ultimately reduce corruption.

Horizontal Accountability and Anti-Corruption Institutions in Brazil

Brazil has a number of accountability institutions that were put in place after the 1988 constitution to constrain corrupt practices under a largely decentralized government structure. These institutions form a "web" of horizontal accountability that occupy the middle ground between electoral and judicial systems at the federal level. They are responsible for three types of activities: (1) monitoring government activities to identify potential corruption, (2) investigation of suspected corruption, and (3) punishment of corrupt practices.[4]

Until the early 2000s most of the monitoring of government activities was done by the Tribunal de Contas da União or Federal Audit Court (TCU). The TCU is the primary agent responsible for oversight of all federal public spending for the legislative and executive branches, with responsibilities ranging from overseeing expenditures, correcting irregular spending patterns, auditing and authorizing public accounts, to applying punitive fines and other sanctions against irregular acts. But the effectiveness of the TCU to monitor and detect corruption was limited by the fact that TCU ministers are politically appointed and the focus on routine tasks and analysis of financial accounts took most of their time. This was specially true after the adoption of the Fiscal Responsibility Law in 2000 that sets rigid limits on spending and requires the provision of transparent fiscal information that had to be checked by the TCU for all levels of governments.[5]

While the TCU act as an oversight agency, the investigation of corruption cases is undertaken by the Federal Police who is in charge of investigating infractions that occur when the Federal Government delivers goods and services. While they are in charge of investigations of

criminal activity, they cannot prosecute cases. This is done by the Federal Public Ministry or Ministerio Public Federal (MPF)—an independent body of the executive and judicial branches with prosecution power. Many view the Federal Public Ministry as the most important institution of accountability at the federal level in Brazil due to its autonomy and highly qualified and motivated personnel.[6]

From the 1990s until early 2000s several corruption scandals emerged in Brazil and the success of these institutions in preventing corruption was limited as anti-corruption laws were weakly enforced (Taylor and Buranelli 2007). At the municipal level, corruption was widespread, fueled by the large amount of resources transferred to municipalities after the 1988 constitution and the lack of control for their use.[7] But since the mid-2000s these patterns have started to change considerably and many authors consider the anti-corruption policies and implementation since the mid-2000s a success (Praca and Taylor 2014). One of the most important innovations in the fight against corruption was the creation of the Controladoria Geral da União or General Comptrollers Office (CGU) in 2001 and its upgrade to a Ministry status in 2003. The CGU centralized all the internal control activities across the Federal government and had an explicit mandate to prevent corruption in the public administration.

While the creation of the CGU improved significantly the monitoring and oversight of public resources, the process of horizontal accountability was strengthened in the past decade by the interaction between the CGU, the Federal Public Ministry (MPF) and the Federal Police. When the CGU uncovers irregularities, they generally pass along their findings to the federal police and the Ministrio Público for analysis and investigation. If credible evidence of wrongdoing were found, the Ministrio Público would proceed to trial in the judiciary. There has been a significant increase in the number of investigations undertaken since the mid-2000s due to an increase in resources available for the Federal Police and an increase in the cooperation between the Federal Police, MPF and other investigative bodies, such as state MPs, Revenue Service Inspectors and ministries (Prado and Carson 2016).

Anti-corruption crackdowns and prosecutions have become more common as task-forces and collaborative efforts between the CGU, the

Public Ministry and the Federal Police have emerged. To measure this institutional change Avis et al. (2016) build a dataset on the joint CGU-Federal Police crackdowns using the information available on the CGU homepage, as well as internet searches.[8] For each year starting in 2003, the CGU lists the name of the Special Operations and a description of the target. For each crackdown, we searched for the name of each operation together with the names of the targeted municipalities and keywords such as "mayor" or "corruption". The dataset is comprised of the name of each municipality targeted by the special operation, a description of the findings, and whether the mayor or public servants of the targeted municipalities were involved in and/or arrested during the crackdown.

In Fig. 9.1 we plot the number of joint operations between the CGU and the Federal Police that took place in Brazil's municipalities between 2007 and 2015. The number of crackdowns have increased considerably,
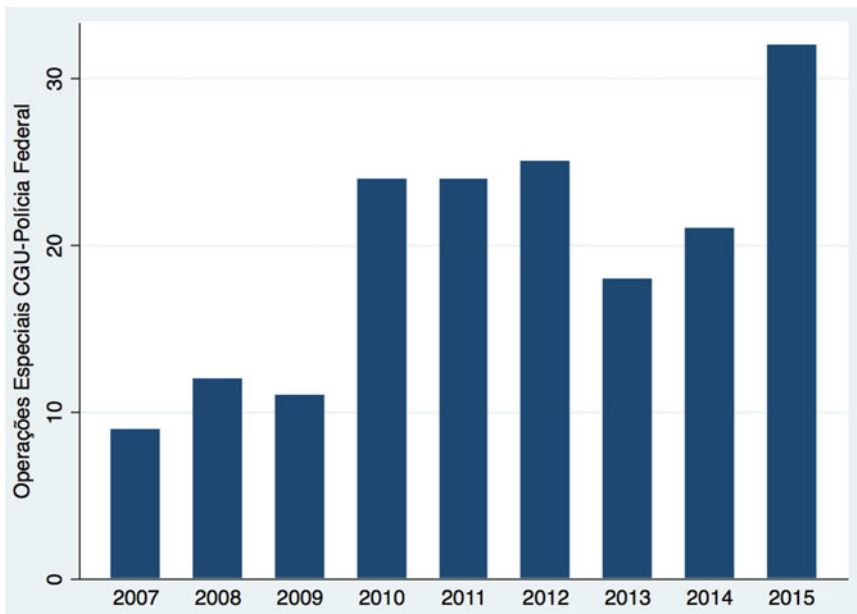

Fig. 9.1 Number of CGU-Federal Police Operations. Notes: This figure displays the number of CGU-Federal Police operations
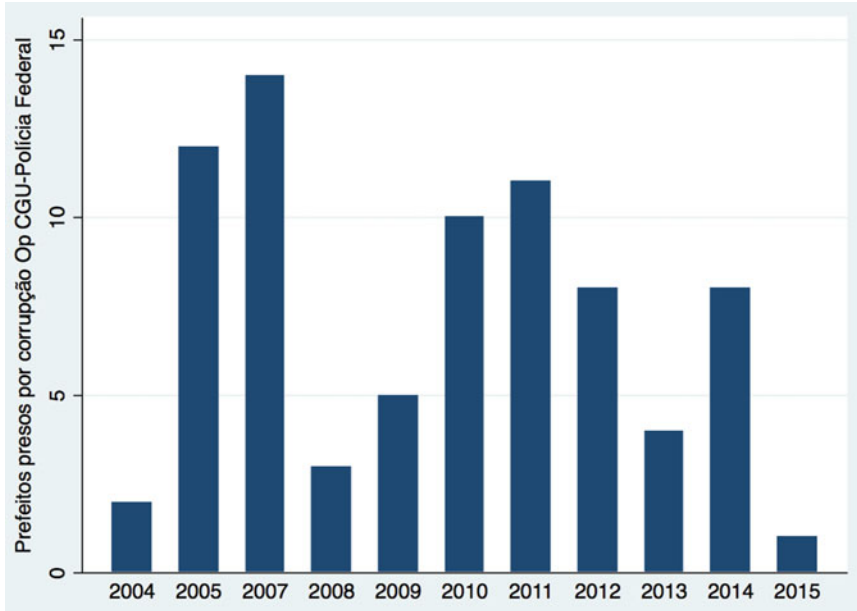
Fig. 9.2 Number of mayors arrested in CGU-Federal Police Operations. Notes: This figure displays the number of mayors arrested in CGU-Federal Police operations

specially after 2010. A significant number of crackdowns resulted from irregularities uncovered initially from audit reports of the CGU and led into the arrest of mayors, secretaries, and other local bureaucrats responsible for malfeasance of public funds as shown in Fig. 9.2.

The Public Ministry have also significantly increased the number of prosecutions and many mayors have been convicted of wrongdoings since the early 2000s. Avis et al. (2016) put together data on the convictions of mayors for misconduct in public office obtained from the *Cadastro Nacional de Condenaes Cíveis por ato de Improbidade Administrativa e Inelegibilidade*. This database, administered by the National Council for Justice (CNJ), includes the names of all individuals charged of misconduct in public office. We downloaded the data in 2013 so the dataset includes all agents convicted up to that point. For each individual we observe the type of irregularity (e.g. violation of administrative principles
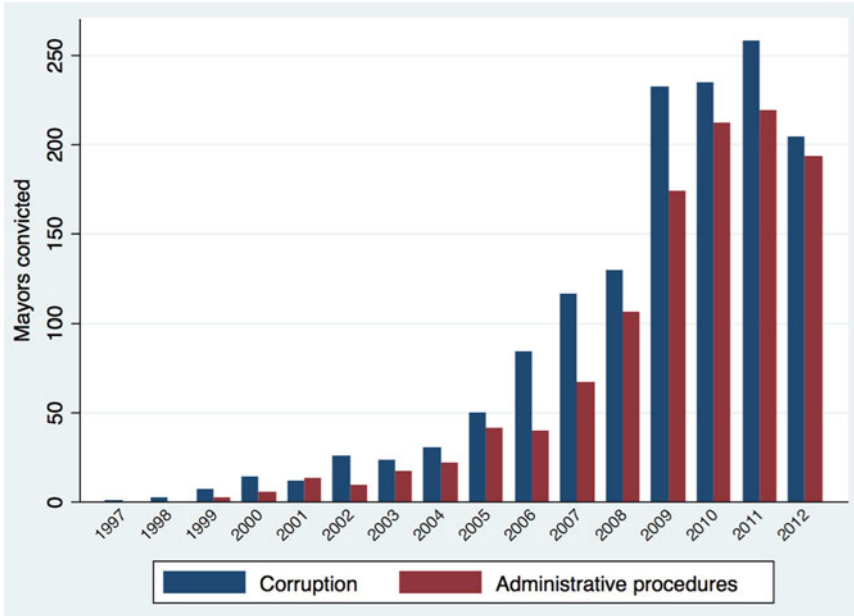
Fig. 9.3 Convictions of mayors. Notes: This figure displays the number of mayors convicted for corruption and administrative procedures by Brazil's civil courts

or diversion of resources), the court where the conviction took place, and the date. In Fig. 9.2 we plot the number of mayors convicted by civil courts. In Fig. 9.3 we observe a sharp increase for mayors that ruled municipalities in the mid-2000s given that it takes, on average, approximately 6 years for a case to be judged by the courts.

Monitoring Corruption Through Randomized Audits

In 2003 the CGU launched a new anti-corruption program based on the random auditing of municipal governments expenditures. The program, named *Programa de Fiscalizao por Sorteios Públicos* or Monitoring

Program through Public Lotteries, consists of random audits of municipalities for their use of federal funds. The first audit drew 26 randomly selected municipalities, one in each state of Brazil. The program was then expanded to auditing 50 and later 60 municipalities per lottery, from a sample of all Brazilian municipalities with less than 450,000 inhabitants. The program has since expanded to incorporate audits for state governments as well.[9] The random selection of municipalities was initially held every two to three months and drawn in conjunction with the national lotteries in Brasilia. Representatives of the press, political parties, and members of the civil society are all invited to witness the lottery to ensure transparency and fairness. All municipalities with a population of up to 500,000 inhabitants are eligible for selection. As of February 2015, there have been 2241 audits across 40 lotteries in 1949 municipalities and over R$22 billion dollars worth of federal funds audited. In Fig. 9.4 we plot the number of municipalities chosen every year since 2003.

Lotteries are done by state so the probability of being audited is constant for municipalities within the same state. For smaller states such as Alagoas, only 1 or 2 municipalities are typically drawn in a single lottery, whereas for a large state like Minas Gerais, with over 853 municipalities, as many as 8 municipalities have been drawn in a single lottery. Once a municipality is audited, it can only be audited again after several lotteries have elapsed.[10] Overall, the audit probabilities in any given lottery are between 1 and 2 percent. But given the frequency of the lotteries, the probability of being audited in a political term (four years in office) can be quite high, ranging from 8.6 percent for the state of Minas Gerais to 26.4 percent in the case of Rio de Janeiro.[11]

Once a municipality is chosen, the CGU gathers information on all federal funds transferred to the municipal government during the previous three to four years and issues a random selection of inspection orders. Each one of these orders stipulates an audit task for a specific government project (e.g. school construction, purchase of medicine, etc.) within a specific sector (see endnote 6). Once these inspection orders are determined, 10–15 auditors are sent to the municipality for one to two weeks to examine accounts and documents, to inspect for the existence
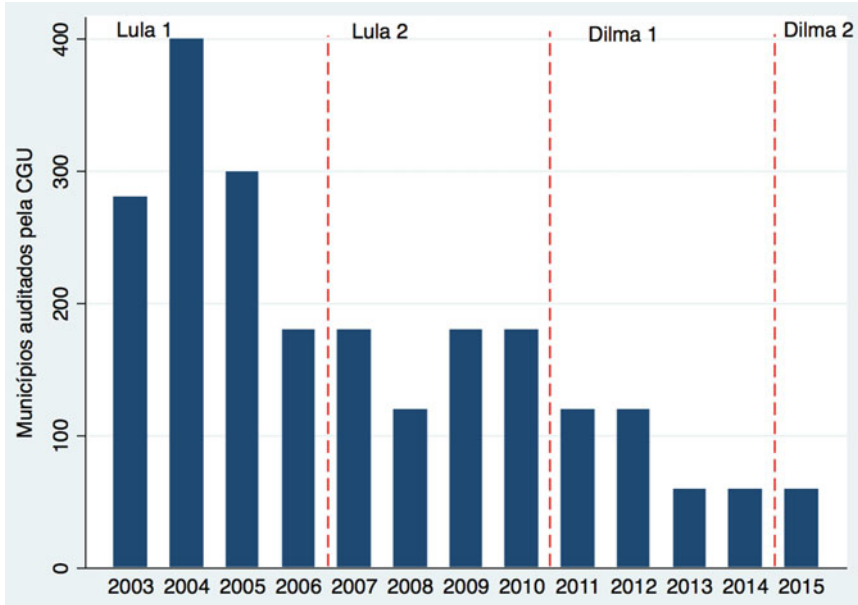
Fig. 9.4 Municipalities audited under the anti-corruption program of randomized monitoring

and quality of public work construction, and to verify the delivery of public services. These auditors are hired based on a competitive public examination and earn highly competitive salaries, thus their incentives for corruption are lower than those of other bureaucrats in the federal level administration. Moreover, the inspections are done by a team which reduces the opportunity for corruption among individual auditors.[12] After the inspections are completed, a detailed report describing all the irregularities found is submitted to the central CGU office in Brasilia. The central unit unifies the information and publishes a report on the internet. These reports are also sent to the Federal Courts of Accounts (TCU), the Federal Prosecutors' Office (MPF), the local judiciary, the Federal Police, and to the municipal legislative branch.

Measuring Corruption Using Audit Reports

One of the main challenges for studying the causes and consequences of corruption and evaluating anti-corruption policies is measuring it. Because corruption is illegal, it is difficult to uncover and measure.[13] The Audit reports available from the CGU under the Monitoring through Lotteries Program provided a unique opportunity to understand and quantify corrupt practices using objective measures.

Ferraz and Finan (2008) use the summary of audit reports posted in the internet by the CGU to measure corrupt practices in Brazil's local governments. Each audit report contains the total amount of federal funds transferred to the municipality and the amount audited, as well as an itemized list describing each irregularity. They read the reports and codified the irregularities listed into those associated with corruption and those that simply represent mismanagement. Most corruption schemes used by local politicians to appropriate resources in Brazil are based on a combination of frauds in procurements, the use of fake receipts or "phantom" firms, and over-invoicing the value of products or services. In addition, the audit reports also suggest that some politicians simply embezzle resources for personal purposes. Ferraz and Finan (2008) define political corruption as any irregularity associated with fraud in procurements, diversion of public funds, or over-invoicing. For each municipality, they sum up the number of times each one of these three irregularities appears.[14]

The information released by the CGU to citizens only provided a partial picture of corrupt practices as it does not contain information on the amount of resources embezzled. Ferraz and Finan (2011) built a measure of corruption by quantifying the value associated with each irregularity uncovered in the audits. To illustrate the approach, it is useful to use an example. In the municipality of Capelinha, for example, the Ministry of Health transferred to the municipality R$321,700 for the Programa de Atenção Básica. The municipal government used fake receipts valued at R$166,000 to provide proof of purchase. Furthermore, there is no proof that the goods were purchased since there were no registered entries of the merchandise in the stock. Also, in 2003 the municipality bought

medicine valued at R$253,300 without procurement. In 2004, the value was R$113,700, also without procurement. They classified this violation as an incidence of irregular procurement and diversion of public funds in the area of health and coded this as a diversion of R$166,000. For each municipality, Ferraz and Finan (2011) sum the amount estimated as diversion and express it as a share of the total amount of resources audited.

The coding of audit reports require judgement over what is considered corrupt practices. An alternative approach is to use the classification used by the auditors themselves. Starting with the 20th lottery in March 2006, the CGU began to code the information contained in the reports for internal use. For each inspection order, the dataset contains information on the sector and government program, the amount transferred to the municipality, and a list of findings. For each finding, the auditors describe the irregularity found and assign a code that classifies irregularities into one of three categories of wrongdoing: (1) irregularities associated with mismanagement (e.g. documents were not properly filled out, or improper storage of food supplies and medical equipment), (2) moderate acts of corruption, (3) severe acts of corruption. Based on this information, Avis et al. (2016) construct measures of corruption and mismanagement at the municipality-lottery level. They measure corruption as the number of irregularities classified as either moderate or severe while mismanagement is measured as the number of irregularities associated with administrative and procedural issues.[15]

Does Exposing Corrupt Politicians Affect Elections?

When the program was launched in 2003 it produced information about local corrupt practices that have never been disclosed before. Ferraz and Finan (2008) describe several newspaper articles suggesting that information from the audit reports were widely used in the political campaigns. An article from the newspaper Diario de Para, in the North of Brazil, illustrates the use of the audit reports in the political campaign and how this information came as a complete surprise to the public:

The conclusions from the CGU were used extensively in the political campaigns, by not only the opposition parties but those that received positive reports as well…The reports were decisive in several cities. In the small city of Vicosa, in Alagoas, where a lot of corruption was found, the mayor, Flavis Flaubert (PL), was not reelected. He lost by 200 votes to Pericles Vasconcelos (PSB), who during his campaign used pamphlets and large-screen television in the city's downtown to divulge the report. Flaubert blames the CGU for his loss (Diario do Para (PA), 10/18/2004).

The information that was made publicly available through audits of local governments was used by candidates, political parties, and citizens in elections. Using data from the first batch of audit reports released before the 2004 municipal elections in Brazil, Ferraz and Finan (2008) examine the effects of exposing corrupt practices of mayors on electoral outcomes. Prior to the October 2004 municipal elections, the CGU had audited and released information on the corruption practices of 376 municipalities randomly selected across eight lotteries. Because municipalities were selected at random, the set of municipalities whose audit reports were only made available after the elections represent a valid control group. Ferraz and Finan (2008) use audit reports for 300 municipalities that were released after the municipal elections as a comparison group. The timing allows them to have information on corruption levels for two groups of municipalities: those whose corruption levels were released prior to the elections—potentially affecting voters perceptions of the mayor's corruptness—and those that were audited and had their results released only after the elections.

We estimated a model that includes an interaction of whether the municipality was audited prior to the elections with the level of corruption discovered in the audit to capture voters' prior beliefs about the incumbent's corruption activities. Our findings suggest that municipalities that were audited and had their findings disseminated prior to the municipal elections exhibit a striking downward-sloping relationship between reelection rates and corruption. Among the municipalities where not a single violation of corruption was discovered, approximately 53% of the incumbents eligible for reelection were reelected. Reelection rates

decrease sharply as the number of corrupt irregularities increase. The estimated relationship suggests that voters care about corruption and hold corrupt politicians accountable when provided with the appropriate information. Ferraz and Finan (2008) use variation in the presence of local radio stations across Brazil and provide evidence that local radio played a crucial role in providing information to voters that allowed them to punish corrupt politicians. They find that audits had a differential effect by both the level of corruption reported and the presence of local radio measured by the number of AM radio stations. The effects of audits were much more pronounced in municipalities that had both higher levels of reported corruption and more radio stations to diffuse that information. While radios are not randomly allocated across the territory, the findings are not driven by schooling levels as we do not find any significant differences on the impact of the audits by literacy rates. In sum, the information disclosed by the anti-corruption policy based on municipal audits provided new information to voters about corrupt practices of their mayors. Voters used this information to update their priors and punish politicians that were found to be more corrupt than on average. The audit effects were in turn more pronounced in areas where the local media could disseminate these findings more widely.

These results are not unique for the Brazilian context. Similar results were found by Larreguy et al. (2014) using data from Mexico's Auditoria Superior de la Federacion (ASF). The ASF is an auxiliary entity to the Lower House of Congress that audits funds transferred to municipalities on a yearly basis. The ASF selects municipalities in each state to be audited according to unknown fixed criteria, which prioritize municipalities with higher variation in federal transfer amounts across years and those not audited in previous years. They examine the release of these audit reports and the extent to which voters reward or punish incumbent parties for irregularities in mayoral distribution of FISM funds. They use the timing of the release of municipal audit reports around elections and compare incumbent parties whose mayor was revealed to have engaged in malfeasant behavior before an election to similarly malfeasant mayors whose audit reports were not published until

after the election. They also use spatial location of media outlets to exploit within-neighboring precinct variation in access to local and non-local commercial quality radio and television signals. They find that each additional local radio or television station reduces the vote share of incumbent political parties whose mayor was revealed to be corrupt or to have misallocated funds earmarked for projects benefiting the poor by up to one percentage point.

Bobonis et al. (2016) study the effects of the audits conducted by the Office of the Comptroller of Puerto Rico (OCPR), an independent body that systematically conducts municipal government audits and makes the findings publicly available to media sources. They exploit variation in the pre-determined timing of the audits to examine how audits that are disclosed before elections affect corrupt practices and electoral outcomes. They find that foreseeable audits that will have results released before elections induce a large short-term reduction in municipal corruption, as well as a reduction in the probability of a successful reelection for incumbent mayors in municipalities with negative audit outcomes, conditional on running for reelection. They also find that in municipalities that had an audit before the election, voters are more likely to reelect the mayor in the following election—specially in more competitive municipalities—a result that is consistent with audits acting as a mechanism to positively select politicians.

While audits can play an important role in allowing citizens to select better politicians, there are instances in which the information provided can trigger responses that can undo the potential informational effects. Brollo et al. (2013) use data from the CGU audit reports in Brazil and combine the identification strategy used by Ferraz and Finan (2008) with discontinuous thresholds on the amount of resources that municipalities receive as transfers from the federal government in Brazil. They compare the electoral punishment of disclosed corruption just above and below the population thresholds and find evidence that the electoral punishment for corruption is weaker when mayors have access to larger transfers to buy more support.

Does the Threat of Exposure Affect Politicians' Behavior?

While political selection is one of the mechanisms through which audits might affect corruption, the threat of an audit can also discipline politicians that have career concerns.[16] When politicians believe that information from audits can hurt their prospective careers, they might refrain from corruption. This is likely to change the behavior of politicians if they think that information from audits can be used in elections. Bobonis et al. (2016) use variation from municipalities in Puerto Rico where the order that municipalities are audited is pre-determined. They find that the number of corrupt violations drops significantly during the last two years of a mayor's term when he knows, ex-ante, that he would very likely be audited before the next election. This result is consistent with Ferraz and Finan (2011) who show that indeed the motivation to get reelected can discipline politicians and reduce corrupt practices. They examine the case of mayors in Brazil that face a two-term limit and compare corruption and mismanagement practices of mayors that are elected for office and can get reelected with those that have been reelected for office and face a term-limit. Using a large number of specifications that control for other differences between these two types of mayors, they find that mayors that face reelection concerns divert less public resources compared to those mayors that face a term-limit. Their results are also consistent with Ferraz and Finan (2009) who compare the performance of city-level legislators across Brazilian cities to examine their performance as salaries increase and the opportunity cost of losing office rises. They find that legislators in cities that pay higher wages perform better and have higher reelection rates consistent with how motivation to remain in office affects politicians' behavior.

In a different context, Zamboni and Litschig (2015) examine the effects of a randomized policy experiment that was designed together with Brazil's Comptroller's Office (CGU) to test whether higher audit risk deters corruption and irregularities in Brazil's municipalities. They randomly chose 120 municipalities and informed that 30 of them would

be selected to be audited in the following year. This increased the annual probability of auditing from close to 5–20 percent. The randomization was carried out by the CGU through a lottery and publicly announced in May 2009. Mayors of these 120 municipalities received a letter from the CGU stating that they were part of a group of 120 municipalities and 30 of them would be audited in the following year. They find that a temporary increase in the annual audit risk by 20 percentage points reduced the share of audited resources involved in corruption by 10 percentage points and the proportion of local procurement processes with evidence of corruption by 15 percentage points. The corruption reduction is entirely driven by procurement modalities that restrict competition and afford discretion to procurement officials in their choice of suppliers.

Does Information from Audits Increase Investigations and Convictions of Politicians?

The monitoring of corruption through audits can affect not only political selection, but also the investigation and prosecution of corruption cases as the Federal Police and the Federal Public Ministry (MPF) have access to information from corrupt practices. Avis et al. (2016) examine the relationship between audits and subsequent investigations of the Federal Police and Convictions for mismanagement and corruption.

They build a dataset on the convictions of mayors for misconduct in public office using data obtained from the Cadastro Nacional de Condenações Cíveis por ato de Improbidade Administrativa e Inelegibilidade. They scrapped the dataset administered by the National Council for Justice (CNJ) that contains the names of all individuals charged of misconduct in public office. They downloaded the data in 2013 so the dataset includes all agents convicted up to that point. For each individual the dataset contains the type of irregularity (e.g. violation of administrative principles or diversion of resources), the court where the conviction took place, and the date. Individuals on this list are banned from running for any public office for at least five years.

They also built a dataset on the joint CGU-Federal Police crackdowns using the information available on the CGU homepage, as well as internet searches. For each year starting in 2003, the CGU lists the name of the Special Operations and a description of the target. For each crackdown, we searched for the name of each operation together with the names of the targeted municipalities and keywords such as "mayor" or "corruption". They created a dataset comprised of the name of each municipality targeted by the special operation, a description of the findings, and whether the mayor or public servants of the targeted municipalities were involved in and/or arrested during the crackdown. Using this information they created an indicator that equals to one if a municipality was subject to a crackdown in a given year and the mayor was involved in the irregularities and/or arrested.

Avis et al. (2016) test whether municipalities that are audited have a higher likelihood of a federal conviction or investigation by the Federal Police. They use the randomized choice of municipalities audited and compare audited to non-audited municipalities using a panel dataset where they follow convictions and Federal Police crackdowns over time. They find that municipalities that have been audited in the past are 0.5 percentage points more likely to face a legal action compared to those that have not been audited. This effect implies that the audits led to an increase of approximately 30 legal actions from a base of 140 among control municipalities. These effects are largely concentrated in places with the presence of a court. And among these municipalities, the treatment increased the likelihood of a legal action by 35.4 percent. Avis et al. (2016) also examine the relationship between the findings of the audits and future legal actions. They regress the measures of legal action on measures of mismanagement and corruption uncovered in the audits. They find that past corruption is strongly associated with the likelihood of a legal action, but acts of mismanagement are associated with any legal costs. Overall these findings suggest that the legal costs of engaging in corruption are substantial.

Do Audits and Judicial Checks Reduce Corruption?

Most of the existing literature on how audits affect corruption has focused on political mechanisms. Audits allow for the monitoring of politicians by releasing information that allow voters to select better politicians or make politicians accountable through reelection. But in countries where institutions can take corrupt politicians to courts, judicial checks and balances on the executive can play an important role in disciplining politicians (La Porta et al. 2004). In this context, policies that increase the monitoring of politicians can supply important information for investigations and prosecutions of corrupt politicians. Thus the threat of legal consequences of rent extraction should also discipline politicians (Becker 1968; Becker and Stigler 1974).

Litschig and Zamboni (2015) use variation in the location of courts in Brazil to examine whether corruption is affected by the presence of courts. State-level prosecutors and judges provide the checks on local officials within their entire jurisdictions but are not physically present in every municipality. Less than half of all municipalities in Brazil have a local judicial presence and the location depends on characteristics such as population, government revenues, and judicial caseload. They use an Instrumental Variable approach that exploits the fact that population is one of the main determinants of court location. Intuitively, they compare corrupt practices in municipalities that are the largest in their district to municipalities with identical population from other districts in the same state, where they are not the most populous. Their findings suggest that the local presence of courts reduces the share of inspections with irregularities related to corruption by 10 percent. The results are concentrated in corrupt practices as they find no effects for procedural irregularities, consistent with the intuition that less serious infractions are less likely to be prosecuted by the judiciary.

Avis et al. (2016) complement the evidence on the location of courts by asking whether audits can reduce corruption by increasing judicial checks to politicians. They examine the role of audits in reducing political corruption among Brazil's local governments by providing information

for investigation and prosecution of corruption cases. They exploit the randomized choice of municipalities to be audited and the fact that since 2003 almost 2000 have been chosen at random, many of which multiple times. Using information from audit reports, Avis et al. (2016) compare the corruption levels discovered among the municipalities that are being audited for the first time to the corruption levels of municipalities that had been previously audited. Because municipalities are selected at random, this simple comparison estimates the causal effects of a past audit on future corruption levels, in a setting in which both groups face the same ex-ante probability of being audited. They find that municipalities that had been audited in the past have significantly fewer irregularities than those that had not been previously audited. They estimate a reduction of 7.9 percent in acts of corruption compared to those that had not been audited in the past. Differently from corruption, mayors that have been audited in the past do not change mismanagement practices. If we consider that the average municipality in their sample received R$15,000,000 in federal transfers per year, their estimates suggest that audits reduced corruption by R$355,000 per year per municipality.

Because under the Randomized Audits Program mayors might learn from other municipalities being audited, Avis et al. (2016) also estimate a model where they test for spillover effects of audits. They regress corruption on whether the municipality has been audited in the past or whether neighboring municipalities were audited in the past. They find that for each additional neighbor that was audited, a municipality reduces its corruption when the local media is present to diffuse information across municipalities. An additional audited neighbor decreases corruption by 7.5 percent when AM radio is present. These results are consistent with Lichand et al. (2016) who also examine the effects of Brazil's audit program with a focus on corruption in health. Using a difference-in-differences strategy, the study tests whether corruption is lower in municipalities that neighbor municipalities that were audited in the past. Consistent with our spillover effects on corruption across all sectors, they find that corruption in health reduced by 5.4 percent in places that neighbor an audited municipality.

There are several reasons why the audits might have reduced local corruption in Brazil. First, as documented in Ferraz and Finan (2008),

the audits may have induced a political selection effect. In places that were audited before the election, voters were able to reward good and punish bad incumbents who were up for re-election. Second, the audits may have led to a stronger electoral disciplining effect, specially for mayors with political career concerns as suggested by Ferraz and Finan (2011). Third, the audits may have affected the political environment more generally by inducing a better selection of candidates. This might have been important in localities where the mayor faced a term-limit. Finally, as previously discussed, the audits might have triggered investigations and prosecutions that increased the judicial checks on the local executive. Avis et al. (2016) estimate a structural model to interpret the main findings and examine these different mechanisms that lead into reductions of corruption. Their results suggest that the disciplining effects from legal costs can explain 72 percent of the reduction in local corruption, while 28 percent is due to electoral discipline and less than 1 percent is due to selection.

Concluding Remarks

This chapter reviews the evidence on the effects of Anti-Corruption Policies in Brazil, with a special focus on the use of audits. We summarize the evidence from a number of papers that use audit reports of municipal governments to quantify corruption. Our summary suggests that, during the early phase of the program, the release of information about corrupt practices had a significant effect on electoral outcomes. But this selection effect cannot account for the long-term reduction in corruption. The evidence suggests that disciplining politicians through elections and legal actions play a crucial role in fighting corruption.

Our results suggest that, despite the excitement with the use of information obtained through audits to promote electoral accountability, this channel alone might not be sufficient to reduce corruption in the long run if public officials adjust their electoral strategies (e.g. Bobonis et al. 2016; Brollo et al. 2013). The fight against corruption might require, not only information and transparency, but also policies aimed at improving the capacity to detect and prosecute corrupt politicians. Strengthening anti-corruption agencies who can implement well-executed random audits

may be an important step toward this direction. Also, institutions that can investigate and prosecute corrupt politicians, as well as a judiciary system that convicts politicians, are needed to increase the judicial checks on corrupt politicians (Alt and Lassen 2008; Besley and Persson 2011; Glaeser and Shleifer 2002; La Porta et al. 2004).

Finally, other policies that ban corrupt politicians from running for office and policies that reduce the incentives for politicians to give contracts in exchange for bribes can also play an important role in the fight against corruption. In the case of Brazil, the *Lei da Ficha Limpa* or "Clean Politician Law" that forbids politicians convicted in the judiciary to run for political offices has helped in the process of political selection. Also the recent reform that bans campaign contributions from firms, while too recent to be evaluated, might reduce the incentives that politicians have to exchange campaign resources with corrupt contracts, a practice that has been widespread in Brazil for many decades.

Comments by Laura Chioda

Anti-corruption policies are often designed either to affect the certainty (the probability of getting caught) or the severity of sanctions (punishment), which ultimately determine the expected punishment. The evidence reviewed by Ferraz and Finan (2017) in this volume provides further evidence that public officials respond to monitoring and punishment, as predicted by basic incentive theory, and complements the conclusions of Olken and Pande (2012). Borrowing from Becker's (1968) framework, let Y denote the gain from the act of corruption (normalizing income to zero in the absence of gains from corruption, for simplicity); let P represent the punishment (or monetary equivalent) conditional on being detected and found guilty; let $U_i(\cdot)$ be utility over income and $p(p_{audit})$ be the probability of detection which is a function of the probability of getting audited (p_{audit}), both increasing in their arguments.

The expected utility from engaging in corruption is then:

$$E(U_i) = pU_i(Y - P) + (1 - p)U_i(Y)$$

Punishment for corrupt practices can operate along four distinct channels. A discipline channel, which is a pure general deterrence mechanism related to an increase in the subjective probability of being detected and experiencing disciplinary action; a reputation effect that is linked to diminished reputational stock should the politician be found guilty of corruption, which in turn lowers future occupational and earnings prospects (due to the reputation of being corrupt or even being prosecuted); an electoral feedback channel, whereby the electorate may punish politicians whose illegal behavior has been exposed (by audits, in the current context); and an entry effect, which can be thought of as an anticipatory response to the electoral feedback and to the discipline channels and leads to positive selection of politicians entering electoral races based on their (lower) propensity for corruption.

As noted by Ferraz and Finan, the mechanisms through which an increase in the probability of detection leads to a reduction in acts of corruption are a combination of the discipline and electoral feedback effects. First, there are electoral consequences (i.e. an electoral feedback): in Brazil (Ferraz and Finan, 2008), Mexico (Larreguy et al. 2015), and Puerto Rico (Bobonis et al., 2016), voters punish politicians who are exposed as having committed acts of corruption by voting them out of office at much higher rates than in municipalities in which there is (as yet) no evidence of misconduct. The media appear to play an important role in these conclusions, as they are the vehicle by which news of the malfeasance is disseminated to the electorate. Indeed, the decline in the likelihood of reelection of corrupt candidates is steeper in municipalities with greater numbers of radio outlets.

It is important to highlight two central implicit assumptions needed for audits, which represent an increase in the probability of detection, to serve as effective deterrence mechanisms. Political competition and independent media reporting on corruption scandals are condicios sine qua non for the electoral feedback channel. Similarly, an independent judicial system, which holds corrupt politicians accountable, is likewise central to the efficacy of the discipline channel (and reputation effect). Indeed, political competition, active media coverage, and an independent judiciary were the three factors highlighted by Glaeser and Goldin (2006)

as leading to a reduction in corruption over time in the US and that can be identified as pre-conditions for audits to be effective.

Adapting Becker (1968)'s model to the current context, the following expression for expected utility reflects the electoral feedback and discipline channels:

$$E(U_i) = pE(U|guilt) + (1 - p)U_i(Y)$$

where

$$p * E(U|guilt) = p_{audit} * p_{judicial}(1 - p_{media}) * U_i(Y - P_{legal})$$
$$+ p_{audit} * (1 - p_{judicial})p_{media}U_i(Y - P_{electoral})$$
$$+ p_{audit} * p_{judicial} * p_{media} * U_i(Y - P_{legal} - P_{electoral})$$
$$+ p_{audit} * (1 - p_{judicial})(1 - p_{media})U_i(Y)$$

where $p_{audit}, p_{media}, p_{judicial}$, denote the probabilities of an audit, of media reporting, and of the judicial system holding guilty politicians accountable, respectively, while P_{legal} denotes the punishments by the judiciary (e.g. in the form of legal costs or jail time) and $P_{electoral}$ represents the punishment by the electorate should audits uncover irregularities.

Given the substantial costs associated with corrupt practices in the event of an audit, a natural question is whether these induce a behavioral response from politicians to avoid them. That is, does the risk of punishment generate deterrence, thereby disciplining politicians (discipline channel)? Bobonis et al. (2016), Ferraz and Finan (2011), and Zamboni and Litschig (2015) document that, in the short run, local officials who face reelection (and positive probability of audit) reduce corrupt practices and divert fewer resources, consistent with monitoring having a deterrent/disciplining effect.

Lastly, the ultimate goal of monitoring is not simply to identify corrupt practices but to reduce overall corruption. Avis et al. (2016) document that the incidence of corruption is substantially lower among municipalities that have, by chance, previously been audited relative to municipalities on their first audit: audits exhibit positive temporal

spillovers. Furthermore, the spillovers have a geographical component: municipalities adjacent to previously audited municipalities also register fewer instances of malfeasance than observationally similar municipalities whose neighbors were never audited.

The Behavioral Response to Audits

This section discusses some of the possible behavioral responses associated to random audits that may be relevant for policy design. This discussion does not have implications for the validity of identification strategies nor the evidence reviewed by Ferraz and Finan, but highlights some additional avenues for future research.

Changes in Subjective Probability The behavior of politicians is of course dependent not only on the objective probability of detection but on subjective perceptions of the probability. Avis et al. (2016) study how a municipality's experience of an audit affects future corruption and find that a prior audit increases the perceived likelihood of getting audited. In our notation, the expected utility is now given by

$$E(U_i) = p(\hat{p}_{audit}) * E(U|guilt) + (1 - p(\hat{p}_{audit}t)) * U_i(Y)$$

where the subjective probability of being audited, $\hat{p}_{audit}$, is a nonlinear function of time elapsed since a previous audit, the history of audits in neighboring municipalities, and of the objective probability of audit:

$$\hat{p}_{audit} = f(p_{audit}, t, history_{neigh})$$

The determinants of the wedge between objective and subjective probabilities of being audited is not only of academic interest, but could inform policy design to increase the efficiency of audits and their optimal temporal spacing. It is conceivable that the impact of experienced audits on behavior exhibits nonlinearities in their temporal distance through changes in the subjective probability of detection over time. For instance,

the saliency of audits may be declining in the time since the previous audit, such that more recent audits are more salient and have greater impact on current behavior.

Optimal Combination of Severity vs. Efficiency For any given amount of expected punishment (given by the product of the probability and severity of the punishment), different combinations of severity and certainty will give rise to different levels of efficiency with respect to deterrence. Empirical evidence can inform the discussion regarding the optimal combination of policy parameters governing the certainty of detection and severity of sentences to maximize the overall deterrence effect of monitoring. To illustrate the trade-off between certainty and severity parameters, holding constant the level of expected punishment, consider two regimes with the same expected punishment of 0.1 years of prison. Regime A is characterized by 1% probability of detection and a sentence for corruption of 10 years; regime B instead has a 10% probability of detection and a 1 year sentence. If the elasticities of corruption with respect to certainty and severity are identical, the same level of corruption will be observed in both regimes. However, the crime literature has documented that property and violent crimes are more sensitive to certainty parameters, while deterrence exhibits rapidly diminishing returns with respect to severity of punishment (Nagin 2003; Chalfin and McCrary 2017; Chioda 2017). It remains an open question whether the same conclusion applies in the context of corruption. Because of the multidimensional nature of the punishment and the likelihood that career politicians exhibit higher than average degrees of patience, there may be ranges of severity and certainty over which this conclusion is reversed.

Compensating Behavior Existing evidence on monitoring interventions intended to reduce corruption documents the short-run effects of these policies. However, it is difficult to establish whether the short term effects reflect a net reduction in rent extraction or merely substitution over time—with high audit risk municipalities making up at least some lost rents in subsequent periods. It could take corrupt officials time to learn how to manipulate a new system, resulting in smaller long-run effects of anti-corruption policies than in the short run. Similarly, officials

may substitute from one form of corruption to another. In the Brazilian context, while Ferraz and Finan document declines in corruption related to the allocation of federal funds, corrupt officials may compensate by concentrating their efforts on other sources, e.g. in the allocation of local funds.

Olken (2007), for instance, reports a decline in missing expenditures resulting from audits of road projects, but documents an increase in the number of project officials family members hired to build the roads. In the context of India's largest rural welfare program, Niehaus and Sukhtankar (2013) document a reduction in government officials theft of piece-rate jobs following an increase in the wages of daily wage jobs (and hence in the ability of officials to steal from those workers): most of the increase in the daily wage owed to beneficiaries was syphoned away by officials. Burgess et al. (2012) find that illegal logging falls in Indonesian districts following increases in their oil and gas revenue, which provide an alternate source of rent extraction for local district officials.

Previous research suggests that the short- and long-run impacts of monitoring could differ materially (Olken and Pande, 2012). Bobonis et al. (2016) provide the first evidence on the diverging long- and short-run impacts of monitoring on political corruption. They find that audits lead to a significant short-term decline in municipal corruption, as well as an increase in incumbent mayors' electoral accountability. However, the level of municipal corruption in the subsequent round of audits is on average the same in municipalities audited preceding the previous election as those whose audits became publicly available afterward.

Because the Brazilian anti-corruption program targets municipal governments, but municipalities are audited only for their use of federal government funds, politicians might react by shifting their focus to state and/or municipal sources of funding. Even if the allocation of local funds is not audited, data on the procurement/disbursement of these funds may be informative. For instance, identifying whether funds are more likely to be awarded to members of the mayors family network may be possible by exploiting conventions in the structure of Brazilian last names; alternatively, discrepancies might be detected between the allocation of grants and actual expenditures via estimation by subtraction (Reinikka and Svensson 2005).

The Size of the Gamble A second behavioral response to the increased likelihood of monitoring may result in changes in the size distribution of corrupt acts, conditional on graft. That is, the conditional distribution of acts of corruption in an environment with audits may lie to the right of the conditional distribution of Y in an environment without audits. That is, the higher probability of detection may be compensated by raising the payoff to corruption, in terms of expected utility. An indirect test of this hypothesis could be derived by evaluating whether the distribution of resources across sectors systematically favored larger sectors following the introduction of the audits or in municipalities that face a higher likelihood of monitoring.

Long Run Effects and the Role of the Media A third channel that may mediate the long run effect of audits involves the relationship between the electoral feedback channel and the media. Bobonis et al. (2016) and Ferraz and Finan (2008) documented the complementary role of the media in disseminating audit results in support of electoral accountability, which may both benefit clean and harm malfeasant incumbent parties. Larreguy et al. (2015) not only confirm these findings but further document that the local media market structure can explain substantial variation in electoral accountability.

   Two possible mechanisms may lead to attenuations of the media-electoral accountability relationship: habituation and discouragement effects. The timing of audits and news matters, but their frequency may be equally important. That is, the salience and appeal of reports of corruption to voters may decline over time such that they are reported less frequently or simply carry less new information than when audits started (i.e. news fatigue/habituation). Even in the absence of news fatigue, reports of corruption may have demoralizing effects on voters and depress voter turnout. That is, voters may become jaded and simply stop paying attention to local politics. Even if audits are timely and sustained Bobonis et al. (2016), the timing and spacing of media reports may contribute to a divergence between short- and long-run impacts of monitoring on political corruption.

Notes

1. See, for example, Di Tella and Schargrodsky (2003), Ferraz et al. (2012), Fisman et al. (2014), Olken (2007).
2. See Olken and Pande (2012) for a review of the literature.
3. See Power and Taylor (2011).
4. See Mainwaring (2003), Taylor and Buranelli (2007), Power and Taylor (2011), Praca and Taylor (2014), Prado and Carson (2016).
5. See Taylor and Buranelli (2007), Speck (2011), Praca and Taylor (2014), Prado and Carson (2016).
6. See Taylor and Buranelli (2007) and Arantes (2011).
7. See Ferraz and Finan (2011) for an overview of corruption practices in Brazil's local governments.
8. See http://www.cgu.gov.br/assuntos/auditoria-e-fiscalizacao/acoes-investg-ativas/operacoes-especiais.
9. See Ferraz and Finan (2008) and Loureiro et al. (2012) for details.
10. This rule has changed over time going from 3 to 12 lotteries.
11. See Avis et al. (2016).
12. Ferraz and Finan (2008) find no evidence that auditors manipulate the audit reports according to municipal and mayor characteristics such as political competition or specific parties. In a recent study of Brazil's federal government, Bersch et al. (2016) found the CGU to be one of the government's most autonomous and least politicized agencies.
13. Olken and Pande (2012) summarize different approaches taken by researchers to uncover and measure corruption.
14. A similar measure was used by Brollo et al. (2013).
15. These data are similar to those used by Zamboni and Litschig (2015), except that our dataset spans a longer period of time. The classification used by the CGU to distinguish between moderate and severe irregularities does not map directly onto the categories used either by Ferraz and Finan (2008) or Brollo et al. (2013). See Zamboni and Litschig (2015) for a discussion of this point.
16. See Besley (2007) for a theoretical framework that describes discipline and selection effects.

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