
Hanna Fölsz

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Department of
Government

gov.msc@lse.ac.uk

Local political responsiveness to electoral pressures on
corruption:

Evidence from an anti-corruption referendum in Colombia

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Abstract

Corruption by local elected officials poses serious impediments to democratic governance and economic development in developing democracies. While local conditions that curb corruption such as local media, governance transparency, and political competition have been studied extensively, local incumbents' behavioural responsiveness to electoral pressure to reduce corruption has received less attention. This dissertation asks whether and under what conditions local elected officials respond to signals of electoral pressure to limit corruption in developing democracies. It employs a case study of a 2018 anti-corruption referendum in Colombia. Interpreting municipal referendum turnout as a signal of constituents' concern with corruption and the corresponding expected electoral punishment, it compares corruption levels across municipalities before and after the referendum. Building a novel dataset of 121,000 municipal procurement contracts, referendum turnout and municipality characteristics, it constructs corruption risk indicators based on well-known mayoral procurement favouritism strategies in Colombia. Its difference-in-differences research design then compares the changes in municipal contracts' corruption risks in high and low turnout municipalities following the referendum. Its regression estimations with municipality fixed-effects show that corruption risks are significantly reduced following the referendum in high-turnout compared to low-turnout municipalities, and that this effect is conditional on municipalities previously experiencing prosecutions for elected officials' misconduct. These findings strongly support this dissertation's theoretical argument that referendums act as signalling mechanisms on specific issues' salience to constituents, and that, conditional on effective electoral accountability, incumbents adjust their behaviour to act more in line with constituent preferences after receiving such a signal. Therefore, conditional on well-functioning local accountability for corruption, local elected officials reduced corruption in Colombia following a signal of high electoral pressures to do so. These findings contribute to academic literatures on local political responsiveness in developing democracies, the consequences of referendums, and local procurement corruption and offer lessons for effective anti-corruption policy design.

Keywords: accountability, corruption, political responsiveness, referendums, local governance

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Contents

1	Introduction	7
1.1	Puzzle and research question	7
1.2	Case study: an anti-corruption referendum in Colombia	8
1.3	Argument and hypotheses	8
1.4	Empirical strategy	8
1.5	Implications and relevance of results	9
2	Local political responsiveness to electoral pressures on corruption and the role of local conditions facilitating electoral accountability	11
2.1	Electoral accountability for corruption	11
2.2	Electoral pressures: issue salience and politicians' responsiveness	13
2.3	Referendums as signalling mechanisms on electoral pressure	14
2.4	Determining responsiveness to electoral pressure: the role of local conditions facilitating accountability	16
3	Corruption and local governance in Colombia	19
3.1	Municipal elections and governance in Colombia	19
3.2	Public procurement in Colombia	20
3.3	Strategies of municipal procurement corruption in Colombia	20
3.4	The 2018 Colombian anti-corruption referendum	22
4	Data and methodology	23
4.1	A novel dataset of municipal procurement and referendum turnout data	23
4.2	Measuring procurement corruption	24
4.3	The difference-in-differences design	25
4.3.1	The parallel trends assumption	27
4.4	Baseline model: Variables and regression estimation	29
4.5	Exploring the conditioning role of effective local electoral accountability	30

5	Results	31
5.1	High referendum turnout reduces subsequent corruption risks	31
5.2	The conditioning role of effective local accountability	33
5.3	Sensitivity analyses and robustness tests	34
5.3.1	Results hold with other treatment assignment mechanisms	34
5.3.2	Post-referendum reduction in use is unique to minimum-value procedures	34
5.3.3	Results hold with expanded sector fixed-effects	35
6	Discussion and interpretation of results	35
6.1	Summary and interpretation of findings	35
6.2	Reasons for confidence in the causal interpretation of findings	36
6.3	Limitations of empirical strategy and potential future improvements	37
7	Conclusion	40
7.1	Summary of results	40
7.2	Contribution and outlook	41
7.3	Policy implications	42
7.4	Some lessons for the fight against corruption in Colombia	42
8	Appendices	43

List of Figures

1	The distribution of turnout across municipalities, n=986	26
2	Share of minimum-value procedure contracts over time in high- and low-turnout municipalities, n=121,002	28
3	Share of contracts with excess costs over time in high- and low-turnout municipalities, n=121,002	28

List of Tables

1	Descriptive statistics for main variables	30
2	Results of regression estimations for Treatment Assignment 1	32
3	Results of regression estimations for prosecution subsample	33
4	Results of regression estimations for no prosecution subsample	34
5	Results of logistic regression estimations for Treatment Assignment 1	44
6	Results of regression estimations for Treatment Assignment 2	45
7	Results of regression estimations for testing Hypothesis 2 - Treatment Assignment 1	47
8	Results of regression estimations for testing Hypothesis 2 - Treatment Assignment 2	48
9	Results of regression estimations for Treatment assignment 3	49
10	Results of regression estimations for Treatment Assignment 4	50
11	Results of regression estimations for other procedure types	51
12	Results of regression estimations with more detailed sector fixed-effects for Treatment Assignment 1	52

1 Introduction

Widespread corruption in developing democracies generates enormous economic, political and social costs. Corruption inhibits development, reduces economic growth, amplifies inequalities and distorts economic incentives (Shleifer and Vishny, 1993; Mauro, 1995; Gyimah-Brempong, 2002; Rose-Ackerman and Palifka, 2016). It also adversely affects democratic stability, erodes trust in democratic institutions and legitimacy, and depresses political participation (Lambsdorff, 2002; Nye, 1967; Anderson and Tverdova, 2003). Local corruption is particularly prevalent in developing democracies, where, despite the existence of formal democratic institutions, local politicians may divert public resources to their corrupt networks and entrench their power through local capture, building corrupt networks and clientelistic relationships of dependence (Reinikka and Svensson, 2004; Hicken and Nathan, 2020). Local corrupt practices in developing democracies have proven especially difficult to combat and continue to pose serious challenges for democratic stability and economic development.

1.1 Puzzle and research question

Given their frequent relative isolation from democratic accountability mechanisms, how responsive are then local elected officials to signals of electoral pressure to curb corruption in developing democracies? Do they adjust their behaviour and reduce corruption in response to a credible signal on high expected electoral punishment for the misuse of public resources? What local conditions are necessary for this to occur? While determinants of local electoral accountability for corruption such as low governance transparency (Ferraz and Finan, 2008; Costas-Pérez, Solé-Ollé and Sorribas-Navarro, 2012), clientelism and vote-buying (Anduiza, Gallego and Muñoz, 2013), and voter apathy (De Sousa and Moriconi, 2013) have been well-studied, the dynamic relationship between voter preferences on corruption and incumbent corrupt behaviour has received less scholarly attention.

This dissertation considers the effect of a signalling mechanism conveying information on the expected electoral punishment for corruption on subsequent corruption by incumbents before the next elections. It first asks whether incumbents constrain their corrupt behaviour if they receive information on strong electoral pressure and corresponding high expected electoral punishment for a failure to do so. Second, it considers whether the general effectiveness of local electoral accountability determines if this dynamic

relationship between electoral pressure on corruption and subsequent incumbent behaviour exists.

1.2 Case study: an anti-corruption referendum in Colombia

These questions are addressed through a case study of a Colombian anti-corruption referendum. On August 26th, 2018 Colombia held an anti-corruption referendum on seven measures designed to curb corruption such as term limits, bans on convicted individuals running for office, and requirements for transparent procurement. 11.7 million people voted in the referendum and 99% of voters supported the anti-corruption measures. Yet, turnout fell 470,000 votes short of the quorum (32% turnout), and therefore the legislation was not enacted. The turnout in each municipality, which varied substantially between 4-55%, is interpreted as a signal to municipal incumbents on the salience of corruption as an issue to their constituents ahead of the next local election. As no formal rules or punishment for corruption changed following the referendum, it enables us to consider solely the effect of mayors receiving information on expected electoral punishment on subsequent corrupt behaviour.

1.3 Argument and hypotheses

Building on the academic literatures on electoral accountability for corruption, local politics in developing democracies, and issue salience and incumbent responsiveness, this dissertation develops two arguments and corresponding hypotheses. First, it argues that if electoral accountability mechanisms work effectively, rent- and re-election-seeking incumbents should adjust their behaviour to act more in line with voter preferences and reduce corruption following an anti-corruption referendum, where turnout delivers a signal on how much electoral punishment they can expect for revealed corruption at the next election. Second, it argues that this effect crucially depends on local conditions that influence the extent of accountability for corruption. It considers whether previous formal punishments for mayors' and councillors' misconduct in municipalities conditions this effect.

1.4 Empirical strategy

The hypotheses are empirically tested through a difference-in-differences design comparing corruption risks in municipalities with high and low referendum turnout before and after the 2018 anti-corruption

referendum. In line with a nascent literature employing objective, micro-level corruption risk indicators based on procurement contracts data (e.g. Fazekas and Toth, 2016; Charron et al., 2017; Tkachenko, Yakovlev and Kuznetsova, 2017) corruption risks are approximated based on contract characteristics associated with high reported corruption such as uncompetitive, non-transparent awarding procedures, excess costs, and delays in contract execution. I construct a novel dataset comprised of data on 121,000 municipal procurement contracts between 2016 and 2019, municipal-level turnout data in the anti-corruption referendum and time-variant municipality characteristics. I first conduct difference-in-differences regression estimations with municipality fixed-effects to test whether high (low) turnout in the anti-corruption referendum led to lower (higher) subsequent corruption in municipalities compared to pre-referendum levels. Following this, I explore whether this result is conditional on the overall efficiency of local accountability, considering the role of previous punishment for municipal corruption. The results strongly confirm both hypotheses. I find that high anti-corruption referendum turnout led to a significant reduction in corruption risks in high-turnout compared to low-turnout municipalities. I further find that high turnout leads to a reduction in corruption levels only if the municipality has previously experienced punishment for elected officials' misconduct. These results are robust to employing different corruption risk indicators as outcome variables, treatment assignments, and regression specifications.

1.5 Implications and relevance of results

These findings have implications for academic literatures, anti-corruption policy and local politics in developing democracies. Its insights contribute to the political economy literatures on electoral accountability and corruption in development, representation and incumbent responsiveness to constituent concerns, and the consequences of referendums. Its results on the conditions under which electoral accountability constraints corruption also provide crucial guidance on the design of efficient policies aimed at tackling local corruption in developing democracies. For the fight against corruption in Colombia, it demonstrates the potential role of popular political participation and the importance of concomitant measures that improve local conditions for accountability.

This dissertation will proceed as follows First, Section 2 outlines its theoretical argument and develops testable hypotheses. Following this, Section 3 describes the institutional background of the Colombian case study. Section 4 describes the dataset and difference-in-differences design, while Section 5 presents the dissertation's main empirical results along with relevant robustness issues and tests. Section 6 discusses and interprets the results. Finally, Section 7 draws conclusions and identifies the findings' implications.

2 Local political responsiveness to electoral pressures on corruption and the role of local conditions facilitating electoral accountability

This section develops this dissertation’s theoretical argument and hypotheses. Building on the literatures on electoral accountability for local corruption, legislative responsiveness, and referendums, it makes its argument in several steps. First, it outlines how in a principal-agent framework incumbent corruption is determined by the accuracy of incumbents’ beliefs about the expected electoral punishment for corruption. Second, it argues that referendums on specific issues act as a signalling mechanism to politicians on the issues’ salience to their constituents and the corresponding electoral pressure they face. Therefore, a referendum on anti-corruption measures allows incumbents to update their beliefs about electoral pressure on corruption and subsequently adjust their behaviour, with high (low) referendum participation propelling them to curb (increase) subsequent corruption. This effect, however, is conditional on effective local electoral accountability mechanisms.

2.1 Electoral accountability for corruption

This dissertation focuses on the effectiveness of electoral accountability in constraining elected officials’ use of political power to act in line with voters’ interests. The accountability literature distinguishes between vertical, horizontal and diagonal accountability based on the actors politicians are accountable to (Ashworth, 2012). Vertical accountability denotes elected officials’ answerability for actions in office to citizens, horizontal accountability to central state institutions, the judiciary and the legislature, and diagonal accountability to third parties including media and civil society organisations (Luehrmann, Marquardt and Mechkova, 2020). Vertical and horizontal accountability facilitate punishment for low incumbent performance, while diagonal accountability serves to increase voters’ and oversight bodies’ information on incumbent quality and mitigate impediments to voters’ championing their interests (Mechkova, Luehrmann and Lindberg, 2019).

Well-functioning vertical accountability warrants that incumbents make political decisions in line with constituents’ interests and do not abuse their political power conferred through elections to their personal

benefit. Elections have both selection effects – voters select candidate perceived to be most competent – and discipline effect – voters punish or reward incumbents’ previous performance (Besley, 2006; Besley and Smart, 2007). One primary function of electoral accountability is inducing elected officials to refrain from corruption, meaning the misuse of public funds for private gain (Svensson, 2005). Corruption entails negative welfare effects, stemming from elected politicians maximising their own welfare rather than voters’ (Lambsdorff, 2002). Therefore, voters should in theory oust corrupt politicians from office.

Principal-agent models provide a useful framework for understanding electoral accountability for corruption. These apply economic theory tools to study the electoral control of rent-seeking politicians (Barro, 1973; Ferejohn, 1986). Discarding Downsian models’ assumption that elected officials implement their announced platforms in office (Downs, 1957), they assume that politicians are self-interested and seek to maximise the rent they extract while in office (Ashworth, 2012). Voters, the principals, confer political decision-making power to politicians, the agents, who, if elected, are tasked with maximising voters’ welfare (Besley, 2006). Yet, self-interested incumbents seek to maximise their own welfare, and voters’ oversight of incumbents is imperfect. This information asymmetry brings about moral hazard issues which incentivize incumbents to appropriate rents and maximise their own welfare (Besley, 2006). Voters’ tool for disciplining incumbents is the threat of punishment in periodic elections. Voters evaluate incumbents’ past performance (Fiorina, 1981; Healy and Malhotra, 2013; Key, 1966), and, through retrospective voting, may decide to “*throw the rascals out*” (Przeworski, Stokes and Manin, 1999). Politicians’ re-election incentives therefore discipline them, creating a trade-off between maximising rent-seeking and re-election chances, which should theoretically reduce corruption in office.

Yet, malfeasance in office remains well-documented, and often takes the form of corrupt spending of public resources, more specifically favouritism in the awarding of government contracts. Procurement favouritism is a prevalent and highly damaging method of corruption, whereby government agencies award contracts to a corrupt network in exchange for bribes, inflating contract costs and reducing efficiency (Fazekas and Toth, 2016). Numerous studies document favouritism in local public procurement. For instance, Gulzar, Rueda and Ruiz (2020) show that in Colombia party campaign donors disproportionately win government contracts from the incumbents belonging to the party they donated to. Mironov and Zhuravskaya (2016) document, using financial transactions data and a difference-in-differences design,

a political cycle of tunnelling in Russia, the practice of financial fraud whereby procurement beneficiary firms transfer assets to political connections around regional elections. Given the vast public resources spent through procurement, the absence of well-functioning electoral accountability for this form of corruption is particularly damaging to voters' welfare.

2.2 Electoral pressures: issue salience and politicians' responsiveness

When delegating political decision-making power to elected officials, voters expect incumbents to fulfil their representational function and implement policy in line with voters' preferences on issues they are most concerned with. Yet, even with well-functioning accountability mechanisms inducing incumbents to legislate in line with constituent preferences, a further criteria must be fulfilled for high-quality representation: incumbents must possess accurate information on the electoral pressure they face to make certain decisions on particular issues.

Issue salience crucially determines representational quality in democracies. Politicians with re-election incentives are more responsive to voter concerns on issues important to voters due to expectations of large subsequent electoral punishment or reward. This has been widely documented by empirical studies, primarily in the American context (e.g. Arnold, 1990; Ansolabehere and Jones, 2010; Kuklinski and McCrone, 1980; McCrone and Kuklinski, 1979). For instance, analysing changes in representation of constituent preferences across nine spending domains in the US, Wlezien (2004) presents evidence confirming that responsiveness to constituent preferences reflects the salience of policy domains.

Politicians' responsiveness to constituent preferences on salient issues depends on the accuracy of their perceptions on voters' preferences on the specific issue itself and the issue's salience, assuming that electoral incentives induce representation. Empirical studies on politicians' perceptions of voter preferences find that while politicians indeed act on their view of voters' preferences (e.g. Mansbridge, 2003), there are substantial variations in perceptual accuracy (Butler and Nickerson, 2011; Hedlund and Friesema, 1972; Miller and Stokes, 1963). Pereira (2019) shows that these biases in elite perceptions of constituent preferences result from (i) social projection – denoting the tendency of politicians to project their own opinions and preferences on the electorate – and (ii) unequal exposure to certain subconstituencies, for instance with higher exposure to more affluent voters. This leads to systematic and

potentially large biases in elite beliefs about voter preferences, which then determine incumbents' policy choices. Still, politicians do update their beliefs and actions following changes in issue salience, even if imperfectly. Hayes and Bishin (2012) exploit the sudden increase in the salience of the Armenian Genocide Resolution in the US. They find evidence of changes in responsiveness to particular subconstituency groups such as more affluent voters with stronger political voice. These insights point to the centrality of voters' preferences and issues' salience in representational quality as well as the dynamic nature of perceptual accuracy. This representational logic should hold for corruption, which is an issue voters often base vote choice on.

2.3 Referendums as signalling mechanisms on electoral pressure

While referendums are an important form of political participation in democracies, their representational consequences have received little scholarly attention, particularly in developing democratic contexts. A referendum is a direct democratic form of political participation whereby citizens vote directly on selected issues with binding legislative consequences rather than delegating decision-making power to incumbent politicians (Gerber, 1996). The political science literature on referendums' consequences is almost exclusively focused on the United States (e.g. Erikson, Luttbeg and Holloway, 1975) or European contexts (e.g. De Vries, 2009; Papadopoulos, 2001). Research on the consequences of referendums primarily considers their implications for electoral politics (e.g. De Vries, 2009) and legislation (e.g. Erikson, Luttbeg and Holloway, 1975; Gerber, 1996). On referendums' consequences for representational quality, the direct democracy literature generally argues that the threat of citizen-initiated referenda (Le Bihan, 2018) and actual legislative outcomes of referenda (Matsusaka, 2018) lead to policy congruency, meaning closer alignment of policy outcomes and voter preferences. This dissertation considers another way through which referendums may induce policy congruency: by increasing the accuracy of incumbents' perception of voter issue salience and preferences prior to incumbents' performance being evaluated in elections.

I argue that participation in referendums can act as a signalling mechanism from voters to politicians on the salience of the specific issue the referendum addresses. The literature on determinants of election turnout demonstrates that how much voters care about issues salient in election campaigns is a crucial

determinant of their turnout decision (e.g. Campbell et al., 1960; Zipp, 1985). As referendums do not directly evaluate political candidates, participation decisions are even more issue-based, determined by issue salience to each individual voter.

Naturally, participation in certain referenda for some voters may stem primarily from partisan, rather than issue-based, motivations. In the extreme, if one party boycotts a referendum, issue salience to voters does not translate into participation for the whole voter base, with some abstaining precisely as they strongly care about the issue voted on. Generally, participation decisions' partisan basis stems from the differential campaigning efforts of different parties for referendum participation. Generally, opposition parties' supporters may be more likely to turn out as their elected representatives do not have direct policy-making capacity, and therefore their preferences translate less into actual policy. Still, this does not impede on referendums' function as signalling mechanisms since electoral pressure on incumbents most often comes from swing voters or opposition supporters, not their own most loyal base anyway. Finally, a further determinant of participation in referendums is habit (Coppock and Green, 2016). However, habit determines participation decisions in elections as well, and therefore electoral pressure is almost always concentrated among the politically active, habitually voting subset of the population. As a result, while these factors determine participation too, the effect of issue salience can still be isolated - unless boycotting takes place - and referendum turnout signals electoral pressure to incumbents.

As further support of this logic, Gause (2020) argues that protests, as costly collective action endeavours, serve as a salience conveying mechanism. She empirically shows using legislative roll call voting data that protests allow re-election-seeking incumbents to learn about and then represent interests of constituent on salient issues. This logic should be even stronger for referendums, which take place in a whole country – unlike protests, which are most often geographically concentrated and in urban environments – and engage a large section of the electorate - unlike protests, where only a negligible portion of the electorate usually participate (Chong, 1991). Therefore, referendum participation conveys even more information on the preferences of the whole electorate across a polity.

Participation in a referendum on corruption, an issue where voters' perceptions are an especially important determinant of vote choice (Klašnja, Tucker and Deegan-Krause, 2016), acts as a strong and

easily interpretable signal of voters' concern with corruption, and the corresponding electoral pressure incumbents face to reduce corruption. If there is high participation in a referendum, corrupt incumbents should expect to lose many votes in the next election. This should induce them to alter their behaviour in line with the electoral pressures they now possess more accurate beliefs about and curb corruption. As a result, the first hypothesis is as follows.

Hypothesis 1: *Under effective local electoral accountability incumbents decrease (increase) their corruption levels following high (low) turnout in a referendum on anti-corruption measures.*

2.4 Determining responsiveness to electoral pressure: the role of local conditions facilitating accountability

The new information on electoral pressures provided by a referendum on corruption should only induce changes in corruption levels if local electoral accountability effectively constrains incumbents. If electoral accountability fails to work in line with principal-agent models incumbents have little incentive to alter their behaviour to act more in line with voters' preferences. This section will address this important precondition and formulate Hypothesis 2.

Empirical evidence shows that voters only limitedly punish corruption at the polls. While incumbents do get electorally punished for corrupt actions, they generally lose only between 5-10% of expected votes following corruption scandals in office (e.g. Dimock and Jacobson, 1995; Peters and Welch, 1980; Bagenholm, 2013). This signals that politicians are not always as effectively constrained by electoral accountability as principal-agent models would suggest and are often insulated from electoral pressures on corruption.

In developing democracies particularly wide variations exist in the quality of local democratic governance, leading to large differences in the effectiveness of electoral accountability for corruption, even within a country. Subnational authoritarianism denotes the phenomenon whereby local-level undemocratic patterns and local pockets of authoritarianism emerge in democratic regimes and co-exist with

formal democratic institutions (Behrend, 2011; Gibson, 2005; Gervasoni, 2010). Local leaders entrench their power through machine politics, creating durable clientelistic relationships of dependency with the local population (Sidel, 1999). Insulated from horizontal and vertical accountability, they exploit state resources for their own corrupt circle's benefit, generating low governance quality and development (Bardhan and Mookherjee, 2006). If they exist, these entrenched local pockets of authoritarianism can insulate local leaders from electoral pressures.

Whether incumbents respond to a signal on electoral preferences for low corruption depends on the expected electoral punishment upon detection of corruption and the probability that voters detect corruption. According to principal-agent models of accountability, the expected utility of corruption can be conceived of in a highly simplified equation as follows: *Utility of corrupt action = expected value of corrupt outcome - expected cost = expected benefit - expected probability of detection * (expected electoral punishment upon detection + expected other sanctions upon detection)*. If incumbents know that voters would only limitedly sanction corruption or that voters are unlikely to find out about their corrupt practices, they will not alter their behaviour following a signal of high voter concerns with corruption.

Previous empirical studies have shown that electoral punishment for corruption depends on local-level factors that influence either the strength of electoral punishment or the probability that voters become informed of the incumbent's corrupt practices. For instance, widespread local corruption may lead voters to regard corruption as a fact of life, expect that all politicians are corrupt, and therefore only limitedly punish corruption in office (De Sousa and Moriconi, 2013). Voters may support corrupt candidates as they accrue material advantages through clientelism and vote-buying (Anduiza, Gallego and Muñoz, 2013; De Sousa and Moriconi, 2013). Low political competition and the absence of a viable, clean challenger candidates insulates the incumbent from electoral pressures and allows them to practice favouritism without substantial electoral retributions (Shleifer and Vishny, 1993; Agerberg, 2020). The transparency of local governance is also a crucial factor, as it determines voters' information availability on incumbent misconduct. Low governance transparency enables incumbent to keep corrupt practices hidden from voters. Ferraz and Finan (2008) exploit a natural experiment in Brazil whereby randomly selected municipalities' audits were released before the 2004 election to show that disclosing information on incumbent corruption reduces incumbent vote share. Djankov et al. (2010) find that in Romanian

municipalities public disclosure of local politicians' initial wealth is associated with lower corruption as voters are better able to determine incumbents' wealth gain in office.

I argue therefore that electoral pressures to reduce corruption only alters subsequent incumbent behaviour if local accountability mechanisms for corruption function well. I further argue that in generally high-corruption contexts, previous prosecutions for misconduct by mayors and local councillors illustrates more efficient local accountability. Therefore, incumbents in high-corruption municipalities with previous sanctioning of corruption should expect higher electoral punishment for malfeasance than incumbents in high-corruption municipalities without previous sanctioning for misconduct. As a result, they should change their behaviour to align better with voters' preferences following a signal of high electoral pressures to reduce corruption to a much greater degree than elected officials in municipalities without previous prosecutions.

Hypthesis 2: *Incumbents' decreasing (increasing) their corruption levels following high (low) turnout in a referendum on anti-corruption measures is conditional on effective accountability for corruption in the municipality.*

3 Corruption and local governance in Colombia

Colombia provides an ideal case study to examine local incumbent responsiveness to constituent concerns with corruption for four reasons. Firstly, the 2018 anti-corruption referendum offers a unique opportunity to empirically examine local electoral accountability for corruption through research designs that overcome common impediments to causal identification. Secondly, in Colombia governance is highly decentralized, with elected mayors possessing discretion over a high proportion of public expenditure. Thirdly, Colombia is characterized by large variations in local conditions relating to electoral accountability including corruption levels, clientelism, transparency and quality of public goods provision across municipalities. Finally, Colombia's public procurement authority publishes high-quality data on all procurement contracts of all government agencies for our period of interest, which allows for the study of corruption risks in municipal contracts.

3.1 Municipal elections and governance in Colombia

In Colombia a large share of governance is decentralised to municipalities headed by elected mayors. Colombia is made up of 1,122 municipalities, grouped into 32 departments. Municipalities are led by mayors who are elected by popular vote every four years, while municipal councils, the local legislative body elected simultaneously, possess a primarily supervisory role.

Colombian municipalities receive large revenue shares from public expenditure and are responsible - jointly with departments - for most public goods provision (Faguet and Sanchez, 2008). Political and economic decentralization over the last half century led to an increasing share of public expenditure taking place on the local level (Alesina, Carrasquilla and Echavarría, 2000). Between 1995 and 2012 local spending's share in total public expenditure rose from 18.5% to 36.8%, while intergovernmental transfers' share in national government expenditures increased from 46.7% to 62.9% (Jaimes, 2020). Municipalities' largest revenue source is highly regulated transfers from the central government (Sistema General de Participaciones, SGP). Municipal taxation, primarily property tax revenue, is the second largest income source, and local governments have full discretion over its spending except a fixed share transferred to regional environmental agencies. Finally, their third largest revenue source is natural resources royalties, 75% of which must be spent on improving local education, health infrastructure, sanitation and water

(Martinez, 2019). Beyond required spending on public services provision in education, health, sanitation and drinking water, municipalities possess discretion over the rest (Alesina, Carrasquilla and Echavarria, 2000; Faguet and Sanchez, 2014).

Mayors exercise substantial powers in local governance with discretion over more than 20% of all local spending, primarily coming from tax revenue (Martinez, 2019). Mayors also design the municipal budget and implement municipalities' annual development plans (Ruiz, 2018). Municipalities in practice possess discretion over finding third party contractors to provide public goods (Ruiz, 2018).

Mayors have incentives to perform well in constituents' evaluation: while mayors cannot be re-elected in consecutive terms, most continue pursuing a political career. Out of all mayors in 1988 62% had stood as candidate for another political office immediately following their term's end (Gulzar, Rueda and Ruiz, 2020). Mayors may also stand for re-elected following a hiatus of one term. Local elections have been characterized by strong political competition in recent years, with on average 4.4 parties' candidates running for office in the 2011 mayoral election

3.2 Public procurement in Colombia

In Colombia public procurement makes up 12.5% of annual GDP (OECD, 2016). Colombia conducts procurement through the Sistema Electronico de Contratación Pública (SECOP), an advanced e-procurement system that records all contracts between government agencies and contractors. All steps of the awarding process must be recorded on SECOP, meaning the system records all procurement auctions, contracts, contract amendments, and documents. SECOP's uniquely comprehensive database of awarded procurement contracts contains extensive, structured information on each contracts' characteristics including contracting authority, winning firm, procurement procedure, value, and post-awarding modifications.

3.3 Strategies of municipal procurement corruption in Colombia

Political corruption is widespread in Colombia, particularly in local governance. Transparency International's 2019 Corruption Perception Index ranks Colombia 96th out of 180 countries (Transparency

International, N.d.). The outgoing Comptroller General estimated that the country loses around \$17 billion, 5.3% of GDP, annually to corruption (Anti-Corruption Digest, 2018). Transparency's report discovered that almost two-thirds of companies worried that they would lose business without paying bribes (Transparency International, N.d.). Looking at bribe-taking by officials in 55 Colombian cities between 2004 and 2011, Langbein and Sanabria (2013) find substantial regional variation in local corruption.

Qualitative accounts and numerous corruption scandals demonstrate the pervasiveness of corruption in municipal procurement. In public discourse the word '*Mordida*' (a bite) refers to the practice whereby mayors ask for a slice of the value of a contract from the recipient in exchange for awarding (Gulzar, Rueda and Ruiz, 2020). In a 2019 political scandal in the city of Cartagena, a phone conversation of Vincent Blel, head of a powerful political family and former senator, was recorded in which he discussed how normally politicians and/or bureaucrats received a 15% commission from companies awarded public works contracts (McConnaughay, 2019). Prosecutions involving mayors' corruption scandals are also frequent, though likely only a fraction of municipal corruption is prosecuted. For instance, in May 2020 the Attorney General Office issued arrest warrants for 10 mayors who abused rapid COVID response public spending on hospitals and safety equipment to award overpriced contracts to political allies and friends (Acosta, 2020).

Local procurement favouritism, the awarding of contracts to predetermined winners in the mayor's corrupt circle, is facilitated by certain common corrupt strategies. In Colombia mayors' most common such strategy is awarding contracts through the minimum-value procedure, which allows the mayor almost complete discretion over choosing the winner. Municipal governments may award procurement contracts through three primary procedure types. First, open-bid contracts, where procurement favouritism is most difficult as calls for proposals must be advertised online for 5-10 days and a committee evaluates bids. Second, contracts with a non-bid process or direct awarding, where the mayor must officially justify the competition waivers. These are limited to a strictly defined set of economic activities, primarily the procurement of standardised goods, health services, agricultural goods, defence and national security, and justified emergencies. Finally, minimum-value procedures may be used for contracts under 10% of municipality budget. These are only required to be advertised for one single day, are awarded automatically to the lowest bidder, and do not require evaluation by a separate committee. Mayors' discretion

is therefore highest for minimum-value procedures, which provide opportunity for favouritism. Further common signals of corruption are the inflation of contract value after signing the contract and delays in contracts' execution.

3.4 The 2018 Colombian anti-corruption referendum

On August 26th, 2018 Colombians voted in a referendum on seven measures aimed at curbing corruption. Following a successful campaign Consulate Popular Anticorrupción by Green Alliance party's senators Claudia López Hernández and Angélica Lozano Correa, the Senate approved the referendum on June 5th, 2018 (El Tiempo, 2018). The seven anti-corruption measures were the introduction of term limits on all governance levels; requiring asset disclosure of candidates and their relatives; prescribing elected politicians to disclose their activities and private interests; requiring public hearings on budgets; making all public sector contracts go through competitively tendering procedures; removing the parole rights of people convicted for corruption; and reducing public officials' and politicians' maximum salaries. The referendum was supported by all incumbent politicians including current President Ivan Duque - even if his party did not actively campaign for votes in the referendu -) (Cobb, 2018), meaning that citizens' decision to vote was not primarily determined by political affiliation.

11.7 million voted in the referendum and 99% of voters supported the anti-corruption measures. Yet, turnout fell 470,000 votes short of the quorum (12.1 million votes, 32% turnout), meaning the referendum was ruled invalid and the anti-corruption measures were not enacted (El Tiempo, 2018). Low turnout is widely attributed to voter fatigue following the presidential election held two months prior and voter apathy due to rampant political corruption (Anti-Corruption Digest, 2018). Still, analysts noted that turnout was still higher than expected (Anti-Corruption Digest, 2018).

Following the referendum, the President and Congress pledged to tackle corruption, but the implementation of the proposed measures was rejected by Congress (El Tiempo, 2018). Therefore, the anti-corruption referendum did not result in any direct legislative change. This makes it possible to isolate the consequences of the electoral mechanisms involved in holding an anti-corruption referendum on municipal incumbents' subsequent behaviour and corruption levels.

4 Data and methodology

4.1 A novel dataset of municipal procurement and referendum turnout data

To test its hypothesis, this dissertation constructs a novel dataset comprised of data on municipal procurement contracts, municipality-level turnout in the anti-corruption referendum, time-variant municipality characteristics, and municipal elected officials' prosecution. The final dataset is comprised of 121,002 contract observations, with contracts awarded between January 1st, 2016 and October 27th, 2019 by 968 municipalities.

Data on municipal procurement contracts was extracted from the SECOP database (SECOP, N.d.), which contains all procurement contracts awarded by Colombian government agencies. I selected contracts between January 1st, 2016 and October 27th, 2019, when the first municipal elections following the anti-corruption referendum took place. I then selected contracts awarded by municipal governments following three steps. First, I selected only contracts where the '*Orden de la Entidad*' (level of procuring entity) included '*Territorial Distrital Municipal*' (territorial, district, municipality), meaning all procurement contracts awarded by departments, municipalities, districts or affiliated public institutions. Following this, I selected contract observations where the issuer name included the word '*Municipio*' (municipality) or '*Alcaldia*' (mayor). Finally, to exclude contracts issued by public institutions affiliated with municipalities such as hospitals, universities or social services agencies, I dropped all observations where the issuer name contained the words '*universidad*', '*hospital*', '*instituto*', '*institución*', '*empresa*', '*E.S.E*' (university, hospital, institution, enterprise, social services enterprise). Finally, from this dataset I dropped all contracts whose sector '*Nombre grupo*') was indicated to be services '*Servicios*') as these primarily constitute municipal staff hiring, rather than contracts for public works.

I coded data on municipal-level referendum turnout directly from the National Registry's website which publishes all official election results (Registraduria, N.d.). Data on turnout in the 2018 presidential election and time-variant municipality characteristics was downloaded from the CEDE database made available by the Universidad de los Andes (Datos CEDE, N.d.). Finally, data on prosecutions of elected

officials in municipalities prior to 2015 was graciously shared with me by Martinez (2019) who collected this data from the Office of Inspector General’s webpage in 2015.

These datasets were finally merged on unique contract and municipality codes, yielding a final dataset of 121,002 contract observations between 2016-2019 for 968 municipalities.

4.2 Measuring procurement corruption

This dissertation constructs corruption indicators from public procurement contracts data. While corruption’s illegality and inherent hidden nature make its empirical research challenging (Burguet, Ganuza and Montalvo, 2016), a recent and growing literature has sought to provide evidence on and understand determinants of procurement corruption using micro-level corruption indicators constructed from large-scale administrative datasets (e.g. Charron et al., 2017; Mironov and Zhuravskaya, 2016; Titl and Geys, 2019). Many of these studies utilize procurement data to construct indicators of corruption risks. They build on evidence of common methods whereby public officials manipulate contracting procedures to award contracts to their preferred firm paying a bribe or reciprocal favour. Measures capture common methods of manipulation at stages of the procurement process. In the pre-tendering stage, the choice of non-competitive and non-transparent procedures (Titl and Geys, 2019), the tailoring of bidding eligibility criteria to specific firms (Fazekas and Toth, 2016), and excessively short advertising periods (Charron et al., 2017) signal high corruption risks. During tender submission, only a single bidder signals likely pre-selected candidate (Coviello and Gagliarducci, 2017; Fazekas and Kocsis, 2017). In tender evaluation an excessively short evaluation period (Charron et al., 2017) and subjective criteria (Fazekas and Toth, 2016) point to probably favouritism. Finally, during contract execution high excess costs (Gulzar, Rueda and Ruiz, 2020), overpayment for standardized products (Bandiera, Prat and Valletti, 2009; David-Barrett and Fazekas, 2019), and significant delays (Gulzar, Rueda and Ruiz, 2020) also signal likely favouritism in awarding. This dissertation builds on the most commonly used, robust measures identified in this empirical literature.

This dissertation employs three measures of corruption risks as explanatory variables: the use of minimum-value contracting procedure, high excess costs, and delays during contract execution. These measures are also the corruption risk measures employed in recent studies of Colombian procurement

corruption by municipal governments by Gulzar, Rueda and Ruiz (2020) and Ruiz (2018). Minimum-value procedure grants the highest discretion to mayors. It may be used for any products or services so long as the contracts' value remains under 10% of municipal budget, may be advertised for only a day, and is awarded automatically to lowest bidder so the municipal council does not evaluate the bids. Its use by mayors for favouritism is well-known. For instance, Gulzar, Rueda and Ruiz (2020) document its widespread use to award contracts to firms who donate to the mayor's election campaign. Whether a contract incurred excess costs after its awarding also signals corruption risks, with inflated costs in implementation often being traced back to favouritism (Fazekas and Toth, 2016). Delays in contracts' execution may also signal high corruption as it shows low efficiency in public goods provision. As different municipalities may pursue different strategies of corruption in procurement, employing multiple measures of corruption risks at both the pre-submission contract design and contract execution stages is expected to enable better approximation of actual corruption than only one indicator.

4.3 The difference-in-differences design

This dissertation employs a difference-in-differences design to study the effect of corruption's salience to voters on local corruption. This design enables us to overcome issues of unobserved heterogeneity in factors affecting corruption risks across municipalities and better isolate the effect of electoral pressures on subsequent municipal corruption levels (Angrist and Pischke, 2009). The fundamental issue is that contracts awarded by high- and low-corruption salience municipalities differ in unobservable characteristics associated with municipal corruption levels. For instance, municipalities with higher corruption may also display higher clientelism, more vote-buying, lower transparency and less effective democratic governance in general, which also affect both municipal corruption and electoral pressures to reduce corruption. Therefore, results of simple comparisons in contract corruption risks between municipalities with high and low electoral pressure would be biased by unobservable factors.

The difference-in-differences design exploits an intervention of an anti-corruption referendum that introduces quasi-exogenous variation across municipalities in electoral pressure to reduce corruption allows us to study the dynamic relationship between local corruption and its salience to constituents. The outcomes studied are corruption risks in municipal procurement contracts. The intervention is the anti-

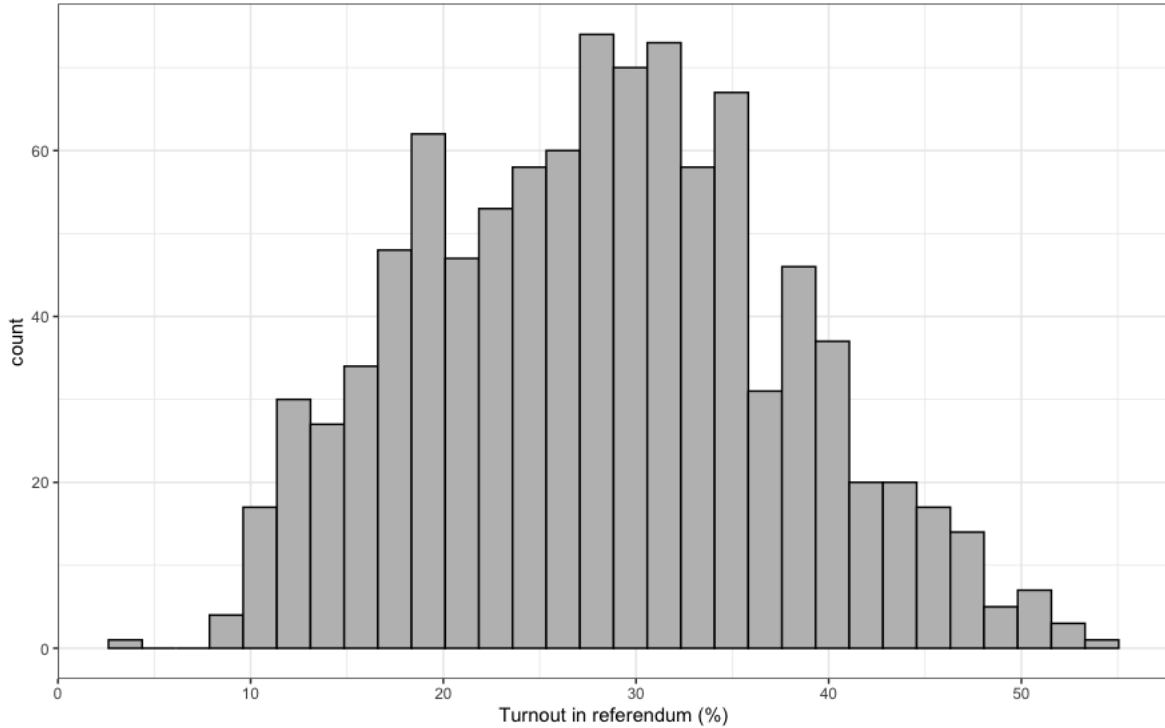


Figure 1: The distribution of turnout across municipalities, $n=986$

corruption referendum on August 26th, 2018. The two time periods before and after the intervention are $t_0 = (1/1/2016 - 26/08/2018)$ and $t_1 = (27/08/2018 - 27/10/2019)$. The treatment is the referendum turnout in the municipality that awarded the contract, which approximates electoral pressures to reduce corruption. The treated units are municipalities with high referendum turnout, while the control units are municipalities with low referendum turnout. Four different treatment assignment mechanisms, meaning classifications of municipalities as high and low turnout, are examined. In the main paper I report results for two treatment assignments: (i) whether turnout in the municipality belonged to the top, middle or bottom third of the turnout distribution across municipalities; and (ii) whether the municipality's referendum turnout as a proportion of turnout in the previous, 2018 presidential election – signalling the scale of referendum turnout compared to expectations based on turnout in previous elections – belonged to the top, middle or bottom third of the turnout difference distribution. In appendices I report results for two further treatment assignment types: (iii) whether turnout was above or below the median in distribution; and (iv) whether the proportional turnout was above or below the median in distribution.

This design allows me to estimate the average treatment effect on the treated (ATT), meaning the change in corruption levels for high-turnout municipalities following the referendum. The ATT will be estimated through fixed-effects regression estimations, which control for the effects of constant municipality characteristics and time-variant Colombia-wide factors on corruption risks in municipal procurement. Further controls for observable covariates such as contract characteristics and time-variant municipality characteristics are also included.

4.3.1 The parallel trends assumption

The difference-in-differences identification strategy’s validity hinges on its parallel trends assumption, which I argue is a reasonable assumption here. The parallel trends assumption posits that the counterfactual “natural” change in the outcome variable for the treated units between the time periods before and after the intervention would have been the same as the change in the outcome variable for the control units between the same time periods (Rosenbaum, 2010). This means that contracts of high-turnout municipalities would have experienced the same change in corruption risk levels before and after the anti-corruption referendum as contracts in low-turnout municipalities did, had they not received the treatment of high anti-corruption referendum turnout. While this assumption is untestable, I argue that it holds as no theoretical expectation leads us to believe high and low turnout municipalities’ corruption risks would have changed differentially when the referendum occurred. No other significant event such as policy or regulation change occurred simultaneously with the anti-corruption referendum. While a presidential election took place 2 months before, there is no reason to assume that the change in the national executive authority would have differentially affected corruption levels in high and low corruption municipalities.

A potential threat to the parallel trends assumption is the endogeneity introduced by pre-referendum campaigns and the ensuing potential differential increase in corruption’s salience in the runup to the referendum in high and low-turnout municipalities. It is possible that more intense campaign efforts took place in high turnout municipalities, making elected officials reduce corruption levels before the referendum more in high-turnout than low-turnout municipalities. While this is possible, the referendum was announced only two months prior, on June 18th and also closely followed the presidential election,

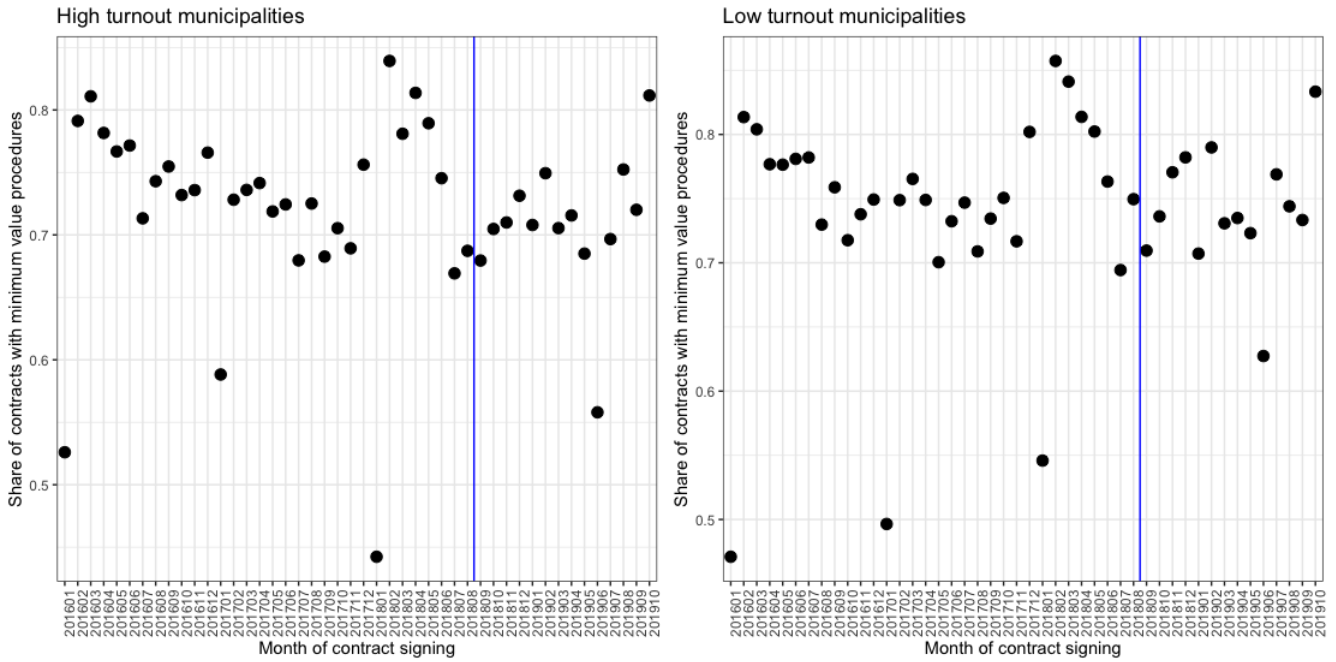


Figure 2: Share of minimum-value procedure contracts over time in high- and low-turnout municipalities, n=121,002

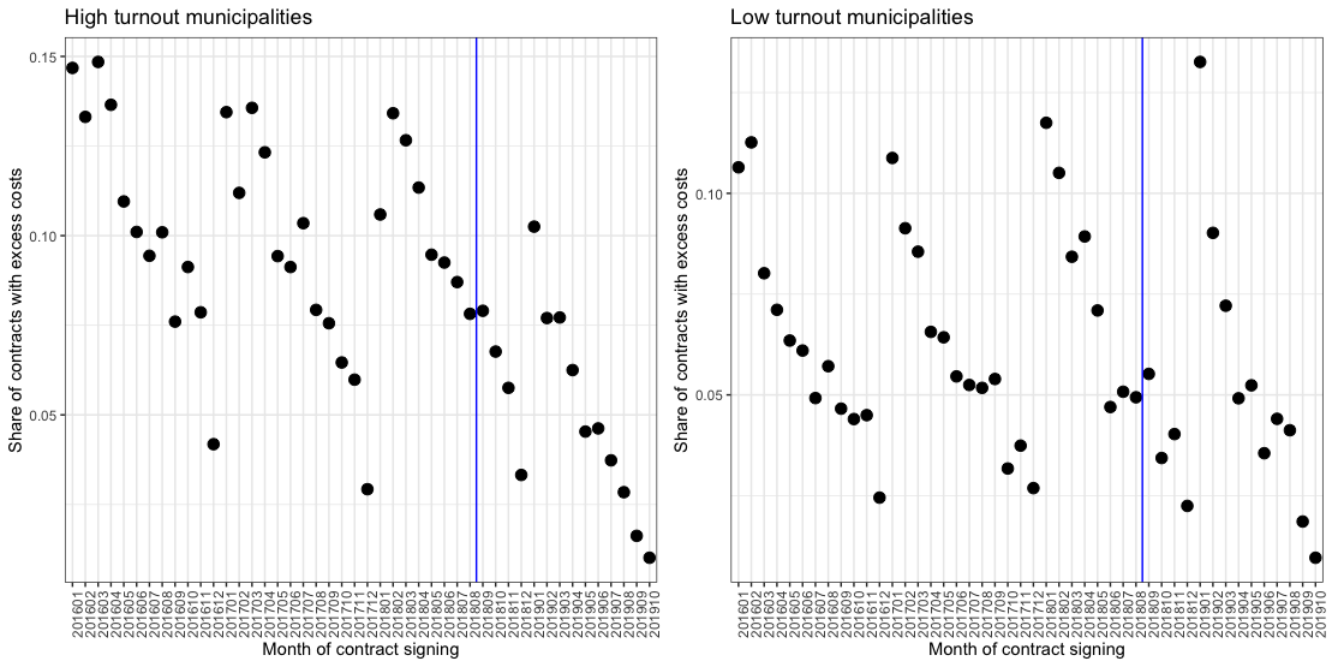


Figure 3: Share of contracts with excess costs over time in high- and low-turnout municipalities, n=121,002

meaning that there was little time and partisan effort for campaigning as well as high voter fatigue. Furthermore, examining the time trends in the corruption risk indicators in high and low turnout municipalities also shows parallel trends (Figure 2 and 3). Therefore, we conclude that the parallel trends assumption holds and difference-in-differences leads to largely unbiased estimates of ATT.

4.4 Baseline model: Variables and regression estimation

To test this dissertation’s first hypothesis, the following baseline regression is estimated.

$$\begin{aligned} \text{Contractcorruptionrisk}_i = & \alpha_0 + \alpha_1 \text{highturnout}_i + \alpha_2 \text{post} - \text{referendum}_i + \alpha_3 \text{highturnout} * \text{post} - \\ & \text{referendum}_i + \alpha_4 \text{contractcharacteristics}_i + \alpha_5 \text{municipality} - \text{yearcontrols}_i + \alpha_6 \text{municipalityfixed} - \\ & \text{effects}_i + \alpha_7 \text{yearfixed} - \text{effects}_i + \alpha_8 \text{sectorfixed} - \text{effects}_i + \varepsilon_i \end{aligned}$$

The regression model is estimated for four outcome variables measuring corruption risks: (i) binary variable for whether contract was awarded through minimum-value procedure; (ii) binary variable for whether excess costs are incurred during contract execution; (iii) size of excess costs; and (iv) binary variable for whether delays occurred in contract execution. The explanatory variable of interest is the interaction variable of ‘*postref*’ – dummy variable for whether the contract was signed before or after the referendum – and ‘*high turnout*’ – dummy variable for whether the contract’s municipality was ‘treated to’ high referendum turnout. Its coefficient is expected to be negative. All models are estimated with municipality, year and contract sector fixed-effects. Further controls are included on (i) contract characteristics including contract value; and (ii) time-variant municipality characteristics including municipality public expenditure, size of central government transfers and violence occurrence. Table 1 displays descriptive statistics for the main contract-level variables.

Fixed-effects ordinary least squares (OLS) and logistic regression estimations are performed. The models with continuous and binary outcome variables will both be primarily estimated using OLS as it provides directly interpretable coefficients and is more appropriate for interaction terms and fixed effects (Gomilla, 2020). Logistic regression estimation results, which constrain predictions of probabilities between 0 and 1 and do not suffer from bias and inconsistency of parameter estimates that OLS may do (Horrace and Oaxaca, 2006), will be disclosed in the appendix.

Table 1: Descriptive statistics for main variables

Variable	Mean	Standard dev.	Minimum	Maximum	Observations
Turnout in referendum	0.296	0.096	0.042	0.548	121,002
Turnout proportional to election	0.575	0.134	0.166	0.984	121,002
Post-referendum	0.346	0.459	0	1	121,002
Minimum value	0.745	0.437	0	1	121,002
Special regime	0.013	0.115	0	1	121,002
Direct contracting	0.0878	0.285	0	1	121,002
Public licitation	0.0173	0.131	0	1	121,002
Excess cost dummy	0.063	0.244	0	1	121,002
Excess cost (thousand pesos)	3,528	83,466	0	11,881,493	121,002
Delay in execution dummy	0.031	0.175	0	1	121,002
Delay length	1.062	9.781	0	572	121,002
Municipal prosecutions	0.501	0.500	0	1	121,002
Contract value (thousand pesos)	105,945	4,342,647	0.01	914,325,831	121,002
Contract execution length (days)	62.73	183.55	0	18000	121,002

4.5 Exploring the conditioning role of effective local electoral accountability

Hypothesis 2 is tested by two methods. Firstly, it is tested by re-estimating the baseline model on subsamples of our dataset divided by whether previous prosecutions for misconduct by elected officials occurred in the municipality awarding the contract. Secondly, it is verified by estimating a new, expanded model that includes a triple interaction term between the baseline model’s explanatory variable and a dummy variable for whether previous prosecutions occurred in the municipality (regression specification in Appendix 1). The new explanatory variable of interest is the interaction of the *‘postref’* (dummy variable for whether contract awarded before or after the referendum), *‘highturnout’* (municipality among the treated units with high anti-corruption referendum turnout), and *‘prosecutions’* (a dummy variable for whether previously the mayor or councillor was prosecuted for misconduct). Its coefficient is expected to be negative, strengthening to high turnout’s negative effect on post-referendum corruption risks.

5 Results

The regression estimations largely confirm this dissertation’s hypotheses. High turnout in the referendum leads to significant subsequent reduction both in the use of minimum value procurement procedures and excess costs during contract execution, with results consistent across different treatment assignments and regression specifications. However, significant post-referendum reduction in corruption risk indicators in high-turnout municipalities only occurs in municipalities with previous precedent of elected officials’ prosecutions for misconduct.

5.1 High referendum turnout reduces subsequent corruption risks

The results from the baseline regression strongly support Hypothesis 1. Table 2 shows that in municipalities with high referendum turnout – meaning turnout in the top third of distribution – after the referendum the probability that contracts are awarded through the high corruption risk minimum-value procedures is significantly (at 1% level) reduced compared to low-turnout municipalities. The probability of the contract running over cost following the referendum also exhibits a significantly larger decrease in high-turnout than low-turnout municipalities (significant at 5% level), with the average size of differential reductions in excess costs a substantial 5.5 million pesos (significant at 1% level). Finally, while the coefficient of the delay in execution outcome variable suggests that high-turnout municipalities’ contracts are less likely to incur delays following the referendum, the effect is not significant. Appendix 2 reports these models’ results employing logistic regression estimation, which yield equally significant results. Regression results from estimations with the second type of treatment assignment – based on the size of the turnout difference between the referendum and the previous presidential election - also support the hypothesis (Appendix 3). While here the results regarding excess costs are less consistently significant, municipalities with high turnout difference are significantly (at 1% level) less likely to award contracts through minimum value procedures after the referendum compared to low-turnout difference municipalities.

Table 2: Results of regression estimations for Treatment Assignment 1

	Model 1	Model 2	Model 3	Model 4
Dependent variable	Minimum value	Excess cost dummy	Excess cost	Delay dummy
Post-referendum	-0.010* (0.005)	-0.033** (0.004)	-554,574 (1,465,516)	-0.585*** (0.167)
Medium turnout	-0.388*** (0.106)	-0.099 (0.076)	22,807,274 (29,278,786)	-0,003 (3.328)
High turnout	0.231*** (0.058)	0.048 (0.041)	-4,813,271 (15,860,834)	-4.181** (1.803)
Medium turnout*post-ref	-0.010 (0.007)	-0.003 (0.005)	-582,961 (1,892,548)	0.152 (0.215)
High turnout*post-ref	-0.029*** (0.007)	-0.011** (0.005)	-5,595,171*** (1,892,641)	-0.061 (0.215)
Contract value (log)	-0.152*** (0.001)	0.031*** (0.001)	8,671,707*** (211,551)	1.060*** (0.024)
Municipality revenue	0.010 (0.009)	0.001 (0.006)	691,232 (2,423,814)	0.098 (0.275)
Municipality transfers	0.001 (0.028)	0.043** (0.020)	-6,425,505 (7,698,016)	-0.607 (0.875)
Municipal violence	-0.00001 (0.0001)	-0.0001 (0.0001)	-787 (32,708)	-0.0004 (0.004)
Peace agreement contract	0.012 (0.012)	-0.003 (0.009)	174,025 (3,364,882)	-0.433 (0.382)
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	121,002	121,002	121,002	121,002
Adjusted R^2	0.422	0.103	0.029	0.049
F-statistic	90.45***	15.04***	4.64***	7.25***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

5.2 The conditioning role of effective local accountability

Regression estimations testing Hypothesis 2 show that previous municipal prosecutions lead to significantly larger reductions in corruption risks in procurement following high turnout in the anti-corruption referendum (Table 3 and 4). We find that results hold exclusively and uniformly for contracts awarded by municipalities with previous prosecutions, with all regression estimations yielding significant effects in the expected direction. For the subset of contracts where the awarding municipality had no previous recent prosecutions, all effects of high turnout in the referendum on subsequent corruption were without an exception insignificant, signalling that the effect is conditional on previous prosecutions. The hypothesized conditionality is further supported by Hypothesis 2's additional test including an interaction with the '*prosecutions*' variable as explanatory variable (results in Appendix 4).

Table 3: Results of regression estimations for prosecution subsample

Dependent variable	Minimum value	Excess cost dummy	Excess cost	Delay dummy
Post-referendum	-0.008 (0.007)	-0.031*** (0.005)	-604,017 (2,185,584)	-0.016*** (0.004)
Medium turnout	-0.401*** (0.153)	-0.173 (0.109)	61,404,651 (46,705,532)	-0.114 (0.082)
High turnout	0.001 (0.065)	0.159*** (0.046)	22,978,933 (19,776,809)	0.004 (0.035)
Medium turnout*post-ref	-0.002 (0.010)	-0.003 (0.007)	65,469 (2,986,788)	0.010* (0.005)
High turnout*post-ref	-0.042*** (0.009)	-0.022*** (0.007)	-9,799,839*** (2,842,539)	-0.004 (0.005)
Contract controls	Yes	Yes	Yes	Yes
Municipality-year controls	Yes	Yes	Yes	Yes
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	63,422	63,422	63,422	63,422
Adjusted R^2	0.434	0.101	0.038	0.067
F-statistic	93.74***	14.61***	5.71***	9.61***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

Table 4: Results of regression estimations for no prosecution subsample

Dependent variable	Minimum value	Excess cost dummy	Excess cost	Delay dummy
Post-referendum	-0.012 (0.008)	-0.037*** (0.006)	-489,281 (1,871,390)	-0.011** (0.004)
Medium turnout	0.018 (0.053)	-0.061 (0.038)	-448,945 (12,285,874)	-0.021 (0.027)
High turnout	0.134*** (0.038)	-0.097*** (0.027)	-1,637,845 (8,853,815)	-0.045** (0.020)
Medium turnout*post-ref	-0.015 (0.020)	-0.002 (0.007)	-1,105,949 (2,295,394)	-0.002 (0.005)
High turnout*post-ref	-0.012 (0.020)	0.002 (0.007)	-549,559 (2,393,907)	-0.005 (0.005)
Contract controls	Yes	Yes	Yes	Yes
Municipality-year controls	Yes	Yes	Yes	Yes
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	57,580	57,580	57,580	57,580
Adjusted R^2	0.403	0.104	0.014	0.060
F-statistic	82.45***	15.08***	2.75***	8.74***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

5.3 Sensitivity analyses and robustness tests

5.3.1 Results hold with other treatment assignment mechanisms

To examine how the choice of treatment assignment rule affects these results' robustness, we consider two further treatment assignment types based on turnout and proportional turnout above and below the median. We find that all our previously outlined results hold and are equally significant as for the previous two treatment assignment types (Appendix 5). While this further confirms the robustness of our argument, treatment assignment type 1 and 2 show that the differential reduction in corruption risks following the referendum for high turnout municipalities is concentrated in municipalities in the top third, rather than half of the turnout distribution. Therefore, due to this further richness of results, regression models employing treatment assignment type 1 and 2 remain the preferred models.

5.3.2 Post-referendum reduction in use is unique to minimum-value procedures

The most robust and highly significant results show in regressions using minimum-value procedures as corruption risk indicator. Inferring support for our hypotheses from these result would be questionable

if there was an equally significant differential reduction in high-turnout compared to low-turnout municipalities in other procurement procedures’ use which are not well-documented methods for mayoral corruption. To reject this possibility, we estimate the same models for the three other most common procurement procedure types as outcome variables. These are the direct contracting, special regime, and public tendering. The results show no significant differential reduction in the use of any other procedure type following the referendum in high-turnout compared to low-turnout municipalities in any of the estimated models employing any treatment assignment mechanism (Appendix 6). This allows us to conclude that this effect is unique to minimum value procedures.

5.3.3 Results hold with expanded sector fixed-effects

To rule out definitively that results capture a differential change in the sector composition of procurement contracts in high and low turnout municipalities following the referendum, the models are re-estimated including two more detailed classifications as contract sector fixed-effects. The two available detailed sector indicators are the ‘product or services family’ (‘*nombrefamilia*’ and ‘*idfamilia*’ variables) and ‘product or services class’ (‘*nombrecease*’ and ‘*idclase*’ variables), which take 295 and 1,569 distinct values respectively in the dataset. Re-estimating the models with these sector fixed-effects yields identical and equally significant results (Appendix 7), further increasing our argument’s robustness.

6 Discussion and interpretation of results

This dissertation shows that local elected officials are responsive to electoral pressure to reduce corruption in developing democracies, conditional on generally effective accountability for local elected officials’ misconduct. This section interprets this dissertation’s findings, outlines the advantages and limitations of its empirical strategy, and suggests potential improvements to enhance the robustness of its causal conclusions.

6.1 Summary and interpretation of findings

The baseline regression estimations’ results strongly support this dissertation’s theoretical argument. It finds that high turnout among constituents in the anti-corruption referendum leads to a subsequent

reduction in a municipality's contracts' corruption risks compared to low referendum turnout municipalities. High local turnout signals that a municipality's constituents care strongly about corruption, inducing local incumbents to estimate large electoral punishments for corruption. They therefore exercise less corruption subsequent to gaining this information, so as to escape electoral punishment for corruption in their next election.

Further regression estimations show that the corruption-reducing effect of high referendum turnout holds only in municipalities with previous precedent for prosecution of local elected officials' malfeasance in office. I argue that past prosecutions signal to incumbents that corruption has retributions, and this, paired with strong electoral pressure, propels them to refrain from corruption. In municipalities without precedent for elected officials' prosecution, corrupt mayors know that they are more insulated from punishment for corruption, and therefore perceive little pressure to reduce corrupt behaviour, in spite of increased electoral pressure. While it may be surprising that prosecutions for malfeasance by mayors and councillors actually signal more effective local electoral accountability, it should be noted that corruption is highly widespread in Colombian municipal governance. This means that no past prosecutions in a municipality are unlikely to signal a complete lack of corruption, but rather primarily untethered corruption. This idea is supported by the correlational evidence in our regression estimations in Appendix 4 that municipalities with previous prosecutions are 30.3% less likely to use minimum-value procedures to award contracts (significant at 1% level).

These results lead us to conclude that, conditional on working local electoral accountability for corruption, mayors are responsive to constituent interest in corruption, curbing corrupt behaviour but only when facing strong electoral pressure.

6.2 Reasons for confidence in the causal interpretation of findings

A number of our research design's attributes warrant confidence in the causal interpretation of these findings.

Firstly, the difference-in-differences design allows us to rule out that unobservable municipality and contract characteristics account for our results. It lends confidence to attributing changes in corruption

levels to the differential effect of the anti-corruption referendum based on local turnout.

Secondly, all regression estimations are conducted employing municipality fixed-effects, which enable us to eliminate the effect of constant municipality characteristics on corruption risks and focus solely on determinants of within-municipality change in corruption risks following the referendum.

Thirdly, contract awarding through minimum-value procedures is the most reliable indicator of corruption risks in our case study and all results are most significant (at 1% level) with this outcome variable. Any post-referendum reduction in minimum-value procedures' use reflects mayors' conscious decision to alter the procedure away from the type well-known to facilitate favouritism.

Finally, while the delay indicator of corruption risks is insignificant in all estimations, this should not cast doubt on the results' validity for two reasons. Firstly, previous studies of mayoral procurement corruption's determinants in Colombia such as Gulzar and colleagues (2020) also found that using delay as outcome variable yielded insignificant results. Secondly, a quick, rushed job and therefore short execution could similarly indicate low-quality and possibly corrupt contracting.

For these reasons, we interpret our empirical results as causal evidence of the corruption-reducing effect of Colombia's anti-corruption referendum conditional on effective local accountability.

6.3 Limitations of empirical strategy and potential future improvements

While numerous factors warrant confidence in this causal interpretation, the empirical strategy possesses a few limitations and corresponding potential improvements that would further enhance robustness and enable deeper insights.

First, while the anti-corruption referendum is expected to account for most change in incumbent corruption levels, it is possible that some endogeneity was introduced by incumbents in municipalities with high electoral pressure reducing corruption in the runup to the referendum. This could have occurred as corruption, a key incumbent performance measure, received increased pre-referendum attention or as

incumbents may wish to strategically avoid drawing further attention to corruption and therefore high turnout, because a valid referendum would have led to new corruption-curbing regulations. Still, I argue that this endogeneity was likely negligible as, first, the referendum did not focus on local corruption specifically and, second, the idea that a mayor would reduce favouritism just to potentially influence a few constituents' turnout decision seems a wasteful and cognitively taxing effort. Moreover, even if such endogeneity exists, it would only weaken our results by dampening the corruption-reducing effect of high turnout. Therefore, the fact that our results exist even if there was such endogeneity only confirms their robustness. Still, employing an instrumental variable for referendum turnout could remedy this issue. Confidence in findings could be further enhanced by collecting evidence from other sources such as interviews with mayors, municipal councillors, local civil society organisations and corruption watchdogs.

Second, disaggregating the channels through which high referendum turnout exerted electoral pressure on mayors could be insightful. This would involve disentangling the influence of elected officials possessing more precise information on high expected electoral punishment for corruption and the differential increase in corruption's salience to constituents in high and low turnout municipalities due to the referendum. As local media and civil society facilitate voter information acquisition and collective action and increase electoral pressure in general but not mayors' perceptual accuracy, possessing information on municipalities' strength of local media and civil society could allow us to separate these effects.

Third, it would be important to verify that, in the face of electoral pressure, municipal elected officials indeed reduced overall corruption, and not just switched to different, more hidden procurement favouritism methods. Employing outcome-based corruption risk indicators relating to the firms winning contracts such as the intensity of specific procuring relationships between firms and municipalities (Auriol, Straub and Flochel, 2016) and the common outcome indicator of one bidding firm (Coviello, Gagliarducci, 2017; Titl. Geys, 2019) could facilitate this endeavour.

Fourth, the reasoning that previous municipal prosecutions proxy for the effectiveness of local electoral accountability would benefit from further empirical verification. A thorough examination of the predictors of municipal elected officials' prosecution and more qualitative evidence on widespread corruption in municipalities without previous prosecutions would support this interpretation. Testing whether re-

sults hold for other indicators of local accountability effectiveness such as municipal transparency and prevalence of clientelism would further strengthen this interpretation.

Finally, important additional insights could be gained from studying the consequences of not curbing corruption following high referendum turnout for mayors' success in the next election they run in. If it is shown that mayors who did not adjust their behaviour following electoral pressure are less likely to be re-elected under effective local accountability, this would lend further support to our theoretical argument.

7 Conclusion

7.1 Summary of results

Corruption by local elected officials poses a serious impediment to democratic governance and economic development in developing democracies. Local politicians' misuse of public resources is widespread and often occurs without retributions, pointing to serious imperfections of electoral accountability. While the academic literature on accountability for corruption has widely studied the local conditions facilitating electoral accountability such as strong local media, governance transparency and political competition, incumbents' behavioural responsiveness to electoral pressure on corruption has received comparatively little scholarly attention. This dissertation sheds more light on this issue by examining changes in corruption levels in Colombian municipalities after various turnout levels in a 2018 national anti-corruption referendum.

This dissertation's empirical inquiry finds that local elected officials are responsive to electoral pressure to reduce corruption in developing democracies, conditional on historically effective accountability for local elected officials' misconduct. Its case study compares corruption levels across municipalities before and after an anti-corruption referendum held in Colombia in 2018. Creating a dataset of municipal procurement contracts, referendum turnout, and municipality characteristics, it constructs corruption risk indicators based on well-known mayoral procurement favouritism strategies in Colombia. Its difference-in-differences research design then compares the changes in municipal contracts' corruption risk levels in high and low referendum turnout municipalities following the anti-corruption referendum. Performing municipality fixed-effects regression estimations, it finds that corruption risks are significantly reduced following the referendum in high-turnout compared to low-turnout municipalities. It further shows that this effect is conditional on municipalities experiencing previous precedents of prosecutions for municipal elected officials' misconduct.

These results strongly support this dissertation's theoretical argument. This dissertation has argued that referendums function as a signalling mechanism on the salience of specific issues for constituents to elected officials. Conditional on effective electoral accountability, incumbents adjust their behaviour to act more in line with constituent preferences after receiving the signal so as to maximise their re-

elected chances. Therefore, turnout in a referendum on implementing strong anti-corruption measures in Colombia can be interpreted as a signal of constituents' concern with corruption and corresponding expected electoral punishment for corruption in each municipality. A high turnout should lead incumbents to reduce corruption levels compared to incumbents in low-turnout municipalities. The results confirm this by show that, conditional on well-functioning electoral accountability, local elected officials adjust their behaviour and reduce corruption following a signal of high electoral pressures to do so.

7.2 Contribution and outlook

This finding contributes to and identifies further areas of research in multiple literature.

Firstly, for the study of political responsiveness on the local level in developing democracies it demonstrates the existence of a dynamic relationship between incumbents' information on voter concerns and their behaviour, and the conditions under which such political responsiveness exists. More insight could be gained by studying the conditioning role of other local-level factors influencing accountability such as governance transparency, prevalence of clientelism and vote-buying, and intensity of local political competition. It would also be insightful to understand the effect of a failure to adjust behaviour following electoral pressures on incumbents' subsequent performance in elections.

Secondly, for the study of referendums, this dissertation's finding highlights the role of referendums as signalling mechanisms of voter concerns to incumbents. Its results demonstrate the importance of studying referendums' consequences beyond legislative and electoral politics and considering more seriously how referendums shape representational quality and incumbent behaviour in office.

Finally, this dissertation contributes to the study of determinants of local procurement corruption by demonstrating the role of signals on strong electoral pressures in constraining procurement corruption. Its use of corruption risk indicators constructed from procurement contracts data in a difference-in-differences research design demonstrates the possibilities in and limitations of objective measures of corruption constructed from large-scale administrative data.

7.3 Policy implications

For policy-makers this dissertation's findings offer key lessons on designing policy to tackle local corruption in developing democracies. Its encouraging result on a referendum's ability to reduce incumbent corruption demonstrates the importance of policy tools involving popular political participation in fighting corruption. However, its result on the centrality of effective local accountability for corruption as a precondition for this shows that as long as local leaders are insulated from electoral pressures, popular will is not enough to limit corruption. Therefore, only by simultaneously implementing policies to facilitate better local accountability for elected officials' misconduct can popular electoral pressure curb local corruption.

7.4 Some lessons for the fight against corruption in Colombia

For Colombians fighting corruption, these findings show that, while the anti-corruption referendum did not lead to legislative change, it was not fully in vain. In municipalities with well-functioning accountability for corruption, a strong expression of popular will to fight favouritism prompted local elected officials to curb corruption. The results on local accountability's conditioning role show that building and strengthening a general political culture of accountability on the local level is crucial for effectively fighting corruption in Colombia.

Replication data: [https://www.dropbox.com/sh/jrnvfy9caj15no/AAAe9wLdXWHIpE6p5BEF0wEIa?](https://www.dropbox.com/sh/jrnvfy9caj15no/AAAe9wLdXWHIpE6p5BEF0wEIa?dl=0)

[dl=0](https://www.dropbox.com/sh/jrnvfy9caj15no/AAAe9wLdXWHIpE6p5BEF0wEIa?dl=0)

8 Appendices

Regression model for testing Hypothesis 2

To test Hypothesis 2, the following regression model is estimated.

$$\begin{aligned} & \text{Contractcorruptionrisk}_i = \\ & \alpha_0 + \alpha_1 \text{highturnout}_i + \alpha_2 \text{post-referendum}_i + \alpha_3 \text{prosecutions}_i + \alpha_4 (\text{highturnout} * \text{post-referendum})_i + \\ & \alpha_5 (\text{highturnout} * \text{prosecutions})_i + \alpha_6 (\text{post-referendum} * \text{prosecutions})_{i,t} + \alpha_7 (\text{post-referendum} * \\ & \text{highturnout} * \text{prosecutions})_i + \alpha_8 \text{contractcharacteristics}_i + \alpha_9 \text{municipality-yearcontrols}_i + \\ & \alpha_{10} \text{municipalityfixed-effects}_i + \alpha_{11} \text{yearfixed-effects}_i + \alpha_{12} \text{sectorfixed-effects}_i + \varepsilon_i \end{aligned}$$

Results for estimating baseline specification for binary outcome variables with logistic regression models

Table 5: Results of logistic regression estimations for Treatment Assignment 1

	Model 1	Model 2
Dependent variable	Minimum value	Excess cost dummy
Post-referendum	-0.042 (0.053)	-0.724*** (0.086)
Medium turnout	-3.436*** (1.074)	-2.158 (1.395)
High turnout	2.908*** (0.674)	-0.486 (1.201)
Medium turnout * post-referendum	-0.111 (0.069)	-0.103 (0.116)
High turnout * post-referendum	-0.258*** (0.068)	-0.009 (0.105)
Contract value (log)	-1.521*** (0.012)	0.461*** (0.009)
Municipality revenue	0.106 (0.089)	-0.033 (0.124)
Municipality transfers	-0.057 (0.286)	0.836** (0.370)
Municipal violence	0.0001 (0.002)	-0.009 (0.006)
Peace agreement contract	0.242* (0.135)	-0.013 (0.156)
Municipality FEs	Yes	Yes
Year FEs	Yes	Yes
Sector FEs	Yes	Yes
Sample size (N)	121,002	121,002
AIC	76,480	48,323

Results for Treatment Assignment 2

The following table presents the results of regression estimations to test Hypothesis 1 using the referendum turnout as a proportion of previous presidential election's turnout as treatment assignment.

Table 6: Results of regression estimations for Treatment Assignment 2

	Model 1	Model 2	Model 3	Model 4
Dependent variable	Minimum value	Excess cost dummy	Excess cost	Delay dummy
Post-referendum	-0.009 (0.005)	-0.041*** (0.004)	-1,303,041 (1,466,392)	-0.617*** (0.167)
Medium turnout		0.177 (0.109)	-33,904,748 (41,854,018)	-3.892 (4.757)
High turnout		0.146 (0.262)	-40,964,792 (100,671,918)	-5.870 (11.44)
Mid-turnout * post-referendum	-0.020** (0.007)	0.007 (0.005)	-1,365,073 (1,891,601)	0.153 (0.215)
High turnout * post-referendum	-0.022*** (0.007)	0.0001 (0.005)	-2,621,093 (1,896,163)	0.031 (0.215)
Contract value (log)	-0.152*** (0.010)	0.031*** (0.001)	8,670,670*** (211,554)	1.060*** (0.024)
Municipality revenue	0.010 (0.009)	0.001 (0.006)	676,393 (2,424,520)	0.100 (0.276)
Municipality transfers	0.0003 (0.028)	0.043** (0.020)	-6,611,157 (7,699,455)	-0.607 (0.875)
Municipal violence	0.00001 (0.0001)	-0.0001 (0.0001)	2,039 (32,720)	-0.0005 (0.004)
Peace agreement contract	0.013 (0.012)	-0.003 (0.009)	306,389 (3,365,967)	-0.453 (0.383)
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	121,002	121,002	121,002	121,002
Adjusted R^2	0.422	0.103	0.029	0.049
F-statistic	90.43***	15.03***	4.63***	7.25***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

Results for regression estimations for test of Hypothesis 2

Below are results for regression estimations for Hypothesis 2. The regression specification for these models is disclosed in Appendix 1. The explanatory variable of interest is the triple interaction term between *high turnout*, *post-ref*, and *prosecutions*.

Table 7: Results of regression estimations for testing Hypothesis 2 - Treatment Assignment 1

	Model 1	Model 2	Model 3	Model 4
Dependent variable	Minimum value	Excess cost dummy	Excess cost	Delay dummy
Post-referendum	-0.010 (0.008)	-0.038*** (0.006)	-734,762 (2,195,931)	-0.299 (0.250)
Medium turnout	-0.383 (0.037)	-0.096 (0.076)	24,530,056 (29,289,931)	-0.053 (3.329)
High turnout	-0.077** (0.037)	-0.032 (0.026)	4,675,043 (10,119,537)	-0.314 (1.150)
Prosecutions	-0.303*** (0.061)	-0.078* (0.043)	11,051,753 (16,651,695)	3.909** (1.892)
Medium turnout * post-ref	-0.016 (0.010)	-0.002 (0.007)	-923,046 (2,774,995)	-0.369 (0.315)
High turnout * post-ref	-0.012 (0.011)	0.002 (0.008)	-306,688 (2,894,472)	-0.095 (0.329)
Prosecutions * post-ref	-0.0001 (0.010)	0.008 (0.007)	321,111 (2,779,040)	-0.490 (0.316)
Mid-turnout*prosecutions				
High turnout*prosecutions				
Mid-turnout * post-ref prosecutions	0.013 (0.014)	-0.001 (0.010)	837,690 (3,826,394)	0.997** (0.435)
High turnout * post-ref prosecutions	-0.031** (0.014)	-0.023** (0.010)	-9,538,621** (3,828,540)	0.031 (0.435)
Time-variant muni. controls	Yes	Yes	Yes	Yes
Contract controls	Yes	Yes	Yes	Yes
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	121,002	121,002	121,002	121,002
Adjusted R^2	0.422	0.103	0.029	0.049
F-statistic	90.19***	14.99***	4.64***	7.24***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

Table 8: Results of regression estimations for testing Hypothesis 2 - Treatment Assignment 2

	Model 1	Model 2	Model 3	Model 4
Dependent variable	Minimum value	Excess cost dummy	Excess cost	Delay dummy
Post-referendum	-0.007 (0.008)	-0.046*** (0.006)	-2,019,086 (2,114,494)	-0.010** (0.004)
Medium turnout	0.347*** (0.041)	-0.007 (0.030)	-5,859,997 (11,348,371)	0.007 (0.022)
High turnout	0.985*** (0.366)	0.147 (0.262)	-41,853,432 (100,672,918)	-0.057 (0.193)
Prosecutions	-0.342*** (0.129)	-0.185** (0.093)	29,259,585 (35,586,237)	0.019 (0.068)
Mid-turnout * post-ref	-0.021** (0.010)	0.010 (0.007)	1,031,444 (2,787,730)	-0.002 (0.005)
High turnout * post-ref	-0.016 (0.010)	0.012 (0.007)	1,288,538 (2,786,351)	-0.005 (0.005)
Prosecutions * post-ref	-0.003 (0.010)	0.009 (0.007)	1,290,538 (2,751,338)	-0.008 (0.005)
Mid-turnout*prosecutions				
High turnout*prosecutions				
Medium turnout * post-ref prosecutions	0.001 (0.014)	-0.005 (0.010)	-4,490,734 (3,795,873)	0.004 (0.007)
High turnout * post-ref prosecutions	-0.012 (0.014)	-0.022** (0.010)	-7,471,093** (3,805,708)	0.010 (0.007)
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	121,002	121,002	121,002	121,002
Adjusted R^2	0.422	0.103	0.029	0.064
F-statistic	90.16***	14.99***	4.63***	9.34***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

Regression results for Treatment Assignment 3 and 4

According to Treatment Assignment 3 and 4, municipalities are 'treated to' high turnout in the referendum if their turnout or turnout difference respectively is above the median in the distribution. The regression results are re-estimated with this looser definition of treatment.

Table 9: Results of regression estimations for Treatment assignment 3

	Model 1	Model 2	Model 3	Model 4
Dependent variable	Minimum value	Excess cost dummy	Excess cost	Delay dummy
Post-referendum	-0.015*** (0.004)	-0.032*** (0.003)	-489,308 (1,219,227)	-0.013*** (0.002)
High turnout	-0.386*** (0.106)	-0.100 (0.076)	23,024,364 (29,278,626)	-0.046 (0.056)
High turnout * post-ref	-0.015*** (0.006)	-0.012*** (0.004)	-4,252,334*** (1,533,701)	-0.002 (0.003)
Contract value (log)	-0.152*** (0.001)	0.031*** (0.001)	8,671,514*** (211,548)	0.019*** (0.0004)
Municipality revenue	0.010 (0.009)	0.001 (0.006)	696,701 (2,423,501)	-0.001 (0.005)
Municipality transfers	0.0002 (0.028)	0.044** (0.020)	-6,408,436 (7,698,328)	0.003 (0.015)
Municipal violence	-0.000 (0.0001)	-0.0001 (0.00001)	2,019 (32,705)	-0.00003 (0.0001)
Peace agreement contract	0.012 (0.012)	-0.004 (0.009)	-3,530 (3,366,183)	0.003 (0.006)
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	121,002	121,002	121,002	121,002
Adjusted R^2	0.422	0.103	0.029	0.064
F-statistic	90.52***	15.06***	4.64***	9.38***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

Table 10: Results of regression estimations for Treatment Assignment 4

	Model 1	Model 2	Model 3	Model 4
Dependent variable	Minimum value	Excess cost dummy	Excess cost	Delay dummy
Post-referendum	-0.013*** (0.004)	-0.037*** (0.003)	-1,582,842 (1,222,640)	-0.014*** (0.002)
High turnout	0.998*** (0.366)	0.145 (0.262)	-40,134,858 (100,675,951)	-0.055 (0.193)
High turnout * post-ref	-0.20*** (0.006)	-0.002 (0.004)	-2,103,534 (1,536,432)	-0.0002 (0.003)
Contract value (log)	-0.152*** (0.001)	0.031*** (0.001)	8,670,275*** (211,522)	0.019*** (0.0004)
Municipality revenue	0.009 (0.009)	0.001 (0.006)	645,303 (2,425,073)	-0.001 (0.005)
Municipality transfers	0.003 (0.028)	0.043** (0.020)	-6,421,052 (7,703,670)	0.003 (0.015)
Municipal violence	0.00001 (0.0001)	-0.0001 (0.0001)	2,354 (32,717)	-0.00003 (0.0001)
Peace agreement contract	0.011 (0.012)	-0.003 (0.009)	133,703 (3,366,737)	0.003 (0.006)
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	121,002	121,002	121,002	121,002
Adjusted R^2	0.422	0.103	0.029	0.064
F-statistic	90.58***	15.05***	4.64***	9.38***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

Regression results for other procurement procedure types

Table 11: Results of regression estimations for other procedure types

	Model 1	Model 2	Model 3
Dependent variable	Special regime	Direct contracting	Public licitation
Post-referendum	0.006*** (0.002)	-0.004 (0.004)	-0.010*** (0.002)
Medium turnout	0.112*** (0.033)	0.351*** (0.083)	-0.018 (0.040)
High turnout	-0.011 (0.018)	-0.072 (0.045)	-0.048*** (0.021)
Mid-turnout*post-ref	0.001 (0.002)	0.003 (0.005)	0.005*** (0.003)
High turnout*post-ref	-0.002 (0.002)	0.019*** (0.005)	0.004 (0.003)
Contract value (log)	0.002*** (0.0002)	-0.011*** (0.001)	0.035*** (0.0003)
Municipality revenue	-0.003 (0.003)	-0.006 (0.007)	-0.004 (0.003)
Municipality transfers	0.004 (0.009)	0.006 (0.022)	-0.015 (0.010)
Municipal violence	0.00001 (0.00004)	0.00004 (0.0001)	0.00004 (0.00004)
Peace agreement contract	0.005 (0.004)	-0.007 (0.009)	0.003 (0.005)
Municipality FEs	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes
Sample size (N)	121,002	121,002	121,002
Adjusted R^2	0.162	0.185	0.167
F-statistic	24.69***	28.71***	25.62***

Regression results with more detailed sector fixed-effects

Table 12: Results of regression estimations with more detailed sector fixed-effects for Treatment Assignment 1

	Model 1	Model 2	Model 3	Model 4
Dependent variable	Minimum value	Minimum value	Excess cost dummy	Excess cost dummy
Sector control type	detailed	most detailed	detailed	most detailed
Post-referendum	0.009* (0.005)	-0.011** (0.005)	-0.028*** (0.004)	-0.028*** (0.004)
Medium turnout	-0.362*** (0.105)	-0.271*** (0.104)	-0.097 (0.076)	-0.128* (0.077)
High turnout	0.231*** (0.057)	0.228*** (0.056)	0.036 (0.041)	0.037 (0.041)
Mid-turnout*post-ref	-0.010 (0.007)	-0.009 (0.007)	-0.003 (0.005)	-0.002 (0.005)
High-turnout*post-ref	-0.028*** (0.007)	-0.026*** (0.007)	-0.011** (0.005)	-0.010** (0.005)
Contract value (log)	-0.149*** (0.001)	-0.150*** (0.001)	0.031*** (0.001)	0.031*** (0.001)
Municipality revenue	0.009 (0.009)	0.010 (0.008)	0.001 (0.006)	-0.00001 (0.006)
Municipality transfers	0.002 (0.028)	0.001 (0.027)	0.045** (0.020)	0.048** (0.020)
Municipal violence	-0.00001 (0.0001)	-0.00002 (0.0001)	-0.0001 (0.0001)	-0.0001 (0.0001)
Municipality FEs	Yes	Yes	Yes	Yes
Year FEs	Yes	Yes	Yes	Yes
Sector FEs	Yes	Yes	Yes	Yes
Sample size (N)	121,002	121,002	121,002	121,002
Adjusted R^2	0.436	0.454	0.110	0.111
F-statistic	74.45***	41.379***	12.82***	7.06***

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors are given in parentheses.

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